



CENSUS OF INDIA, 1951

VOLUME I

I N D I A

PART I - B — APPENDICES TO THE
CENSUS REPORT, 1951

R. A. GOPALASWAMI,
OF THE INDIAN CIVIL SERVICE,

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APPENDIX I

Population and Land Use

Introductory Note

Section I — Prefatory Remarks

I. GENERAL OBJECTIVE

THE objective of this series of tables is to bring out the relationship between population and natural resources in general and cultivation in particular, in India and its various zones and natural divisions. The data presented in the tables include physical factors like topography and climate, mineral resources, land utilization, cropping patterns and crop yields, and trends in cultivation. The relationship between population and cultivation has been brought out in special detail. Differences in cultivation *per capita* in different parts of the country have been shown, as also trends in population growth, cultivation and cultivation *per capita* for the last several decades. Finally, selected data on population, cultivation, crop yields etc., in U. S. A., Great Britain, the U.S. S. R and other countries have been presented in order to afford a comparison of trends in India with those in other countries.

2. HISTORICAL ANALYSIS

A word needs to be said about the historical analysis of population growth and cultivation (TABLES 1.5 to 1.8). This analysis has been divided into two parts, depending upon the availability of reliable and comparable data. In the first part which deals with the period 1921-51, trends in population growth and cultivation have been shown for a large number of natural divisions. The second part deals with the sixty-year period : 1891-1951. For this part, the area coverage is much smaller— 8 natural divisions in full, and parts of 5 natural divisions— because comparable and reliable data were available for only these areas. Due to various factors like changes in boundaries of districts and States and extension of non-reporting into reporting

areas, comparable data for such a long period were not available for a large part of the country. Only those areas were taken for this analysis in which such changes were either non-existent or were very small, and where the statistics were of a sufficient degree of reliability throughout the period to warrant long-term comparison. A scrutiny of all available data showed that only 8 divisions and parts of 5 divisions satisfied these requirements. These are, however, located in different parts of the country. In spite, therefore, of the limited area coverage a good cross-section of the country is obtained.

This historical analysis brings out the sharply contradictory character of the trends of change before and since 1921. Prior to 1921, growth of population and cultivation were nearly in balance. Population increase was fitful and slow, and increase in cultivation managed to keep pace with it. After 1921, however, population growth has been rapid and uninterrupted, while increase in cultivation, even where it has occurred, has been small and proportionately much less than the increase in population. Therefore, cultivation *per capita* had maintained substantially the same level upto 1921. Since 1921, it has been steadily falling everywhere.

That cultivation has been failing to keep pace with the growth of population is generally known and is almost a truism. *It is not generally known (and it is, therefore, very important to appreciate) that this failure can be dated.* The historical analysis is especially important because it establishes this fact and provides quantitative measurement of the decline of cultivation *per capita* since it started.

3. COMPILATION AND PRESENTATION OF DATA

The data for these tables have been compiled from published official statistics wherever these were available. These statistics were checked by the department concerned, and special efforts were made to (1) make adjustments for changes in administrative boundaries; (2) fill the gaps in statistical coverage, and (3) compile the statistics (which are generally available for districts and states) for natural divisions and sub-regions. In certain cases, where the data did not exist in the desired form, special compilations have been made by the department concerned. Thus, data on topography *i.e.*, area of mountains, hills, plateaus and plains (TABLE I'0) was specially compiled by the Survey of India. Details of the manner of collection and processing of data for each table are given in Section III.

4. SCHEME OF NATURAL REGIONS, SUB-REGIONS AND DIVISIONS

It has been customary in past Censuses to compile subsidiary tables and to review Census data not only for the political and administrative units of the country but also for the territorial units which were deemed to be 'natural'. This arrangement was discontinued in All-India

Reports after 1911, though it was continued in the Census Reports of the old provinces and states. At this Census, it was decided that the system should be revived for purposes of the all-India review also. As, however, immense territorial changes had occurred since 1911, a completely new scheme of classification of the territory with reference to the physical conditions was worked out. The country has been divided into five natural 'regions' with reference primarily to topographical features. Each of the natural regions is divided into 'sub-regions' with reference primarily to rainfall and climatic conditions and also differences in soil so far as these are broadly identifiable and are reflected in the cropping pattern. The 15 sub-regions are further sub-divided into 52 'natural divisions'. The intersection of these sub-regions with the states forms the basis on which natural divisions are formed.

In addition to the threefold division of the country according to natural conditions, the states have also been grouped, for purposes of convenience of review, into six population 'zones'.

Details regarding the composition of natural regions, sub-regions, divisions and the zones are given in Census of India Paper No. 2 of 1952 and also at the end of Part I-A.—Report.

Section II — Collection, scrutiny and collation of data

5. At the population censuses the total population of the country was ascertained and data on the various characteristics of the population *e.g.*, sex, age, civil condition, economic status, means of livelihood, literacy etc., were collected and tabulated and the results were published in the census tables. Along with these tables narrative reports of the Census Superintendents and the Census Commissioner for India, which reviewed the data collected at each census, were also published. The reports of the Census Superintendents and the Census Commissioner in the earlier censuses, referred to the agricultural conditions of their respective charges and for India as a whole respectively. At the 1951 Census, all the State Census Superintendents were requested to prepare the following Subsidiary Tables and to review them in

their reports—

Subsidiary Table 4.7 — Progress of cultivation during three decades: 1921-31, 1931-41 and 1941-51.

Subsidiary Table 4.8 — Components of cultivated area *per capita* during three decades

Subsidiary Table 4.9 — Land area *per capita* (1951) and trend of cultivation *per capita* during three decades.

6. For preparation of these tables cultivation statistics for the quinquennia* ending the years 1920, 1930, 1940 and 1950 were necessary. As in the case of vital statistics, cultivation statistics are unavailable for some parts of the

* Single year figures were unsuitable because of fluctuations of cultivated area consequent on variation in seasonal conditions from year to year.

country; are available in others only for recent years but not for earlier years; and the degree of reliability also differs from state to state. In order to help the Census Superintendents in the preparation of their subsidiary tables, the Economic and Statistical Adviser to the Ministry of Food and Agriculture was requested to supply cultivation statistics for the average of five years immediately preceding the census years 1951, 1941, 1931 and 1921. Apart from the inherent defects in the statistics themselves, other difficulties had arisen. The partition of the country and the merger and integration of the former princely states made it extremely difficult to compile figures, especially for earlier quinquennia. In the circumstances, figures based on available data were supplied by the Economic and Statistical Adviser and these were communicated to the Superintendents as a provisional first draft of the statistics to be finally published. The Superintendents scrutinised the figures in close collaboration with local departments dealing with agriculture and land statistics and prepared their subsidiary tables. Some of the Superintendents had to modify the figures supplied by the Economic and Statistical Adviser, where it was certain that fuller and/or more up to date information was locally available and was known to be more accurate. Others retained the figures of the provisional first draft as given by the Economic and Statistical Adviser at the Centre. In such cases also, care was taken to secure that the local authorities were made aware of and had no objection to the figures which were finally adopted. Subsidiary tables prepared by the Superintendents on the basis thus explained are published in the state census reports.

7. GENERAL COMMENTS ON CULTIVATION STATISTICS

It has become customary in recent years to condemn the quality of our statistics without adequate discrimination between those which are reliable and those which are not. Such condemnation is usually accompanied by equally uncritical laudation of the statistics of other countries. Some comments of a general character on the nature of these statistics are, therefore, necessary. To begin with, a sharp distinction should be made between statistics of 'cultivated acreages' and statistics of 'yields and yield rates'. The methods of securing data are

different and the quality of data secured are also different.

In respect of statistics of cultivated acreages, India is equipped with a system which yields for the greater part of the sub-continent, very detailed data with a degree of accuracy which is probably as good as the best in the world. The system of 'village papers' — officially maintained records of village land, listed by field plots — can be traced back to well over two thousand years. It was greatly improved in the last century (as part of the processes of settlements and re-settlements of land revenue and rent). The principal improvements were made in three directions : *First*, — the lineal measurements and area computations became scientifically exact and field plots were plotted on maps; *Secondly*, — the ancient office of village accountant — which had fallen on evil days — was resuscitated, reformed, and established on a secure basis permanently; and *Thirdly*, — the records as well as the holders of these village offices were put to use continually, kept under supervision and control, and thus brought to a high pitch of efficiency.

Unfortunately, all parts of the country did not benefit equally by these reforms. Territories under princely rule remained largely untouched — though there were a few states which undertook similar reforms. The permanently settled zamindaris needed very little by way of management of the land revenue. In the greater part of the areas where this system prevailed (but not all) the records were improved, but the office of village accountant was allowed to die out and there was very little of organised administrative linkage between the village and the Government. The poor quality of almost all statistics (as much else, besides, in the administrative field) is traceable to these weaknesses. In the temporarily settled zamindari areas, office of village accountant has been maintained; and, though land revenue management has not been as detailed as in raiyatwari areas, general administration has been strong enough to make adequate use of records and personnel. The resulting statistics are, therefore, of the same high quality. The main problem in all India compilation has been the treatment of those parts of India for which no statistics were received and those other parts where, owing to the absence of professional survey and/or the

absence of village accountants in physical contact with the land, the quality of statistics was poor. In recent years, the Ministry of Food and Agriculture has been making great efforts to close the gap and achieve complete cover. This task has been greatly complicated by the partition of the country and the merger and integration of the former Indian States which made it very difficult to compile figures and maintain comparability with earlier periods.

8. CATEGORISATION OF AREAS

In the light of this general appreciation it is obvious, that the statistics cannot be used effectively unless the areas are distinguished with reference to the nature and quality of their figures. Accordingly, four 'Statistical Categories' were adopted and the areas classified from the point of view of availability, reliability and comparability of cultivation statistics. The four categories are :

Statistical Category 'A' territories

These are territories for which cultivation statistics of a reliable character are available on a comparable basis throughout at least the latest thirty-year period — 1921-50. They include one state (Bombay) for which reliable data are available for a much longer period, but the element of comparability has been unfortunately spoiled in respect of the last few years, by the diffused inclusion of former princely states for which separate statistics are unavailable.

Statistical Category 'B' territories

These are territories for which cultivation statistics for the past three decades are available but are known to be generally less reliable than statistics for Category 'A' territories and include states where errors which affect comparability are known to exist.

Statistical Category 'C' territories

There are territories for which cultivation statistics are available round about 1950 but not continuously for earlier years. The quality of

such statistics is also of the same order as those of Category 'B' territories, or poorer.

Statistical Category 'D' territories

These are territories for which statistics even of the meagre kind described for Category 'C' territories are unavailable or are available only in a form which presents difficulties of localisation. For such territories a rough estimate has been attempted for 1951.

Annexure I to this Note shows against the name of each state the category to which it has been assigned. For Statistical Category 'D' territories, it also gives the basis on which the estimates have been arrived at.

9. RESULTS OF DETAILED EXAMINATION OF CULTIVATION STATISTICS

The figures given by the Economic and Statistical Adviser, the figures given by the Superintendents of Census Operations in their subsidiary tables, and the figures already published in the Census of India Paper No. 2 of 1952 were examined in detail in order to locate gaps and discrepancies, remove errors, and fill in the gaps wherever material was available for the purpose. As a result of this examination it was concluded that the quality of the cultivation statistics obtaining in different states was so markedly different that an all-India consolidation for all states could *not* be attempted on a uniform basis *i.e.*, by adopting in entirety either the Economic and Statistical Adviser's figures or the figures given by the Census Superintendents in their Subsidiary Tables or the figures given in Census of India Paper No. 2 of 1952. It therefore became necessary to accept one of the three sets of figures in relation to each state separately as the best available statistics and to discard the other two. Which of the three sets of figures has been adopted in respect of each state is also given in *Annexure I*. On the basis of the foregoing analysis the best estimates for *current cultivation statistics* have been made. These are given in TABLE 1.4.

A reconciliation of the figures for Net Area Sown as given in TABLE 1.4 and the Census of India Paper No. 2 of 1952 has been effected. The reconciliation statement is given as *Annexure II* to this Note.

Section III — Tables described

10. TABLE I·0 : CLASSIFICATION OF LAND BY TOPOGRAPHY, POPULATION AND AVERAGE ANNUAL RAINFALL

This table classifies the land area of each state and natural division by mountains, hills, plateaus, plains etc., and on the basis of this gives the extent of the topographically usable area of each state and natural division. As mentioned above, this information is based on data supplied by the Survey of India. The definitions adopted for purposes of this special compilation were as follows :

- Mountains** : Steep hills generally above 7,000 ft. in altitude.
- Hills** : Weathered high lands up to an elevation of 7,000 ft.
- Plateaus** : Relatively flat lands that lie at an elevation between 1,000 to 3,000 ft.
- Plains** : Generally flat lands, with elevation up to 1,000 ft.

Mountains, thus defined, include only the Himalayan ranges above 7,000 ft. in elevation and very small areas in the ranges of Peninsular India. Ranges below 7,000 ft. in the Himalayan as also all the ranges of Peninsular India, subject to the above exception, have been classified as hills.

Topographically usable area has been compiled from these figures on the following basis :

Topographical class	Proportion considered usable*
Mountains	5 per cent
Hills	25 per cent
Plateaus	75 per cent
Plains	95 per cent

In the plains there are large areas of sandy desert and marsh land, mostly in Rajasthan and

* These proportions have been adopted from the book, PEARSON AND HARPER: "The World's Hunger", Cornell University Press, 1949. In this book the authors have calculated the topographically usable area for all the continents of the world.

This method of classification of topographically usable area should not be considered more exact than it actually is. It gives a general indication of the extent of topographically usable area in a large territory, say a continent, or a large country. It should not be taken to furnish a precise estimate of the topographically usable area in a relatively small area like a natural division. Thus the ratio of 75% for plateaus is somewhat low in many parts of India as is shown by the fact that in North Deccan the crop-land (sown area plus current fallow) is actually more than the area considered topographically usable.

Kutch. These have been separated and shown in *Annexure I* to this table. These areas are considered un-usable and have been excluded in calculating the topographically usable area for the plains.

11. COMMENTS ON TABLE I·0

It will be seen from this table that plains occupy 43% of the land area of the country, plateaus about 28%, hills about 18% and mountains about 11%. The topographically usable area totals nearly 505 million acres or 62% of the total land area of the country (500 million acres and 66% for the area of the 1951 Census). The proportion of the topographically usable area to the total land area is of course the highest (80%) in the Northern Plains region and lowest (34%) in the Himalayan region. The proportion for the Northern Plains region would be considerably higher, but for the inclusion in its western part (Rajasthan and Kutch) of large areas of sandy desert.

Topographically usable area *per capita* works out to an average of 1·40 acres for the country as a whole. The range of variation between the various divisions is fairly large—from 7·57 acres in Kutch to 0·35 acres in Travancore-Cochin. However, if extremes like Kutch and the Rajasthan Dry Area Division—where much of the area is really un-usable (or is of very low utility) because of low rainfall—are excluded, the range of variation is considerably reduced. In the plains divisions, the variation is generally between $\frac{1}{2}$ and $1\frac{1}{2}$ acres; and in the Peninsular hills and plateaus divisions between 1 and 3 acres *per capita*. It is not to be supposed that the assumptions made in the preparation of this table are, in any sense, final. How accurate and complete information of all the facts which determine the usability of land is to be ascertained, recorded and used is a problem with many aspects—for which solution is to be found. The table now presented is regarded as only the first step in the solution of the problem.

12. TABLE I·1 : DISTRIBUTION OF AREA OF REGIONS, SUB-REGIONS AND DIVISIONS BY RAINFALL (RAINFALL BELTS)

Just as the first table gives the distribution of the area of each natural region, sub-region and division by topographical classes, this table shows the distribution of area by rainfall belts.

Five rainfall belts have been distinguished on the basis of total annual rainfall. The area of each natural division, sub-region and region falling within the different rainfall belts has been shown in the table. This classification into five rainfall belts has been designed so as to conform to the observed differences in vegetation and agricultural patterns.

These rainfall belts have been shown in a map in the main report. For convenience of reference each rainfall belt is referred to hence-

forth by the colour by which it is shown in this map. Thus the belt with rainfall above 75 inches will be referred to as the Blue Belt, that with rainfall between 50" and 75" as the Dark Green Belt and so on.

This table has been prepared from the isohyetal map of India supplied by the Indian Meteorological Department. The area of each belt has been calculated by adding up areas of whole districts, and estimated areas of parts of districts, on the basis of this map.

Belt	Annual rainfall	Rainfall characteristics	Vegetational and agricultural characteristics
1. Blue Belt	above 75"	Rainfall generally dependable; rainy season longer than in the rest of the country mainly because of pre-monsoon storms; number of rainy days more than 75 per year.	Evergreen forest; rice is the principal crop; other wet zone crops like jute, coconut and tea are important.
2. Dark Green Belt	50" to 75"	Rainfall generally dependable; rainy season shorter than in (i) above; number of rainy days 60 to 75 per year.	Mixed evergreen and deciduous forest; rice still the principal crop; irrigation needed principally as a standby.
3. Light Green Belt	30" to 50"	Rainy season confined to the monsoon season, <i>except</i> in the South Madras area where rainfall occurs also from October to December; average number of rainy days range between 40 to 60 per year; rainfall less dependable and failures of rain experienced sometimes.	Deciduous forest; mixed humid and dry zone crops; rice, wheat and millets principal foodgrains; rice and other wet crops predominate towards the wetter margins and wheat and millets towards the drier margins; irrigation necessary for the <i>rabi</i> crops and desirable as a standby for the <i>kharif</i> crop.
4. Brown Belt	15" to 30"	Rainy season short; average number of rainy days between 25 and 45 per year; rainfall undependable and areas subject to frequent famines and scarcities.	Thorn forest; dry zone crops; wheat and millets main cereals; irrigation needed for both <i>rabi</i> and <i>kharif</i> crops.
5. Yellow Belt	Below 15"	Rainfall sporadic and undependable; number of rainy days below 20.	Desert vegetation; dry zone crops like millets and wheat are grown; irrigation for cultivation necessary.

Annexure I TO TABLE I '1

An abstract of the data furnished in the main table is given in this *annexure*. It also shows the proportion of area of India and its five natural regions falling under the different rainfall belts. It will be seen from this abstract that about one-third of the area of the country is included in the two humid belts—blue and dark green; one-third is in the sub-humid light green, and one-third in the two dry belts—

brown and yellow. Thus, it will be seen that in about two-thirds of the area of the country water deficiency is a major problem and irrigation a necessity. The intensity of moisture deficiency and the need for irrigation increases progressively as one moves towards areas of lower rainfall.

The above figure, however, does not fully bring out the extent of moisture deficiency or the need of irrigation in the agricultural areas of the country. Most of the area of the dark blue and dark green belts, which is well supplied with

moisture, is hilly and mountainous and is, therefore, not fit for agriculture. On the other hand, plains and plateau areas in which most of the agricultural land is situated, are mostly included in the yellow, brown or light green belts. Thus in the Himalayan region, 90% of the land is in the blue and dark green belts. By contrast, in the Northern Plains region where topography is more favourable for agriculture, 55% of the area is in the two dry belts—yellow and brown; and 85% of the area is included in the three belts—yellow, brown and light green.

Annexure II TO TABLE I·1

Further information on the brown and yellow belts is presented in this *Annexure*. It shows the distribution of the area of each belt by sub-regions, and makes estimates of the population of each belt. The estimates of population are based on the population of the districts or parts of districts included in the belts. The yellow belt is one contiguous area in the north-western part of the country. It includes a large area of western Rajasthan, most of Kutch and a small part of southern Punjab. The brown belt is, however, divided into three parts—northern, central and southern. The northern brown belt extends as a broad arc round the yellow belt from Punjab in the north to Saurashtra in the south. The central brown belt occupies a large area in the Peninsular Hills and Plateau region. It extends from the Vindhyas in the north to the plateau of Mysore in the south and covers most of the area of the Deccan. The southern brown belt is a relatively small area in Madras. It gets separated from the central brown belt because of somewhat higher rainfall over Mysore and parts of Madras.

Extent of Irrigation in the dry belts : The availability of irrigation in the dry belts is shown in *Annexure II* to the next table—1·2. In this *annexure*, the area of each belt has been divided on the basis of availability of irrigation in the following manner :

- (i) TRACTS WITH GOOD IRRIGATION—where the percentage of irrigated area to the total area sown exceeds 20%;
- (ii) TRACTS WITH FAIR IRRIGATION—where the percentage of irrigated area to the total area sown is between 5% and 20%;

- (iii) TRACTS WITH POOR IRRIGATION—where the percentage of irrigated area to the total area sown is less than 5%.

The total land area, population classification of land area, and the extent of irrigated area are shown for each belt and tract.

It will be seen from this *annexure* that in the yellow belt out of a total reported sown area of 7·7 million acres, 1·9 million acres or almost one-fourth is irrigated. Fifty-five per cent of the reported sown area is classified as being in tracts with good irrigation and the balance in those with fair irrigation.

In the northern brown belt, irrigation is available for about 10·6 million acres out of a total sown area of about 51 million acres. About 35% of the sown area is classified as being in tracts with good irrigation. Most of the irrigated area is also included in these tracts. Nearly half (24·4 million acres) of the sown area is classified as being in tracts with fair irrigation. But the total area receiving irrigation in these tracts is rather small, being 2·3 million acres or less than 10% of the total area sown.

In the southern brown belt also, availability of irrigation is good. About two-thirds of the sown area is classified as being in tracts of good irrigation and the balance in tracts of fair irrigation. In the central brown belt, however, irrigation is available only to a very limited extent. The total area receiving irrigation is only 2·9 million acres or about 6% of the total sown area. Nearly the entire belt is classified as being in tracts of fair or poor irrigation. The main reason for the small area of irrigation in the region is its hilly and plateau topography, by reason of which irrigation can be developed only in a few favoured localities.

Annexure III TO TABLE I·1

This *annexure* gives for the various rainfall divisions periods of successive years of deficient rainfall during 1891-1920 and 1921-50. The years in which the average annual rainfall was below the normal by 11% or more have been treated as years of deficiency.

13. TABLE 1·2 : CLASSIFICATION OF LAND AREA (1951)

This table shows figures on classification of land into major land use classes : 'forest,' 'not available for cultivation,' 'other un-cultivated

land excluding fallows', 'fallow land' and 'net area sown' for India, the zones and the sub-regions. It will be seen that the classification of land figures are available for only 623.4 million acres out of a total land area of 812.6 million acres. The balance of 190 million acres is the unclassified area for which returns of agricultural statistics are not available.

The distribution of the unclassified areas shows that they would be unproductive for the most part. The unclassified areas are located mostly in hilly, mountainous or desert regions. Nearly 60 million acres are in the Western Himalayan sub-region—mostly in Jammu and Kashmir state; another 40 million acres are in the Desert sub-region. Other large areas are also in the hilly or dry regions. In the fertile well-watered plains areas like the Lower and Upper Gangetic Plains sub-regions, or the two sub-regions of the East Coast, there is practically no unclassified area.

Sown area totals 268.4 million acres or 33% of the total land area (43% of the classified area). Current fallows total another 59.4 million acres. Total crop-land (net area sown plus current fallows), therefore, totals 327.8 million acres, which is 40% of the total land area of the country and 52.6% of the classified area. It may be mentioned that the proportion of crop-land to the total land area in India is about the highest among the large countries of the world. Also, we have noticed that the topographically usable area amounts to 505 million acres. If from this total are taken out areas which are unsuitable on climatic and other grounds, the areas needed for pastures and areas which must remain under non-agricultural uses like villages, towns, cities, roads etc., it is clear that a very high proportion of the cultivable area is already occupied by cultivation purposes. The figures of column II in this table are very significant in this connection. These show the proportion of crop-land (sown area plus current fallows) to the total classified area in the various zones and sub-regions. It will be seen that in quite a few cases the figure is between 60% and 70% and in some, e.g., North Deccan and the Lower Gangetic Plain, it is between 72% and 75%. The figures reflect the intensity of the land use, the result of efforts through the centuries to bring as large an area of land under cultivation as possible.

14. TABLE 1.3 : CROPPING PATTERN

This table shows the cropping pattern or the distribution of the sown area among major crops in India, the six zones and the fifteen sub-regions. The main points brought out by this table are well-known, namely :

- (i) that foodgrains occupy nearly 80% of the total sown area in the country;
- (ii) that among the foodgrains, the largest acreage is under rice (70 million acres or nearly 23% of the sown area); millets come next with 60 million acres and 20% of the sown area; and wheat comes third with 24 million acres and 8% of the sown area; and
- (iii) that among the non-food crops, oil seeds and fibres (cotton and jute) are the most important. Other crops like tea, tobacco, coffee, though of high value, occupy small areas.

The small acreage (about 5% of the sown area) under fodder-crops is significant. It shows that the agricultural economy of India like that of China, Japan and other countries of Monsoon Asia, is based on the production of crops. It is not a crop-and-livestock economy as is the mixed agriculture of western Europe or eastern United States. Therefore, in spite of the fact that India has the largest number of cattle in the world and very large number of sheep and goats, barely 5% of the sown area can be spared for growing fodder-crops. In contrast, in U.S.A. besides vast areas of pasture lands, more than one-fifth of the entire crop-land is devoted to production of hay; nearly all the corn (which is the most important cereal grown), is used for feeding livestock, as also large quantities of oats, barley and other cereals.

Differences in the cropping patterns in different parts of the country reflect mainly the influence of the varying topographic and climatic conditions. Thus, the distribution of rice, wheat, millets and other crops is the result of these natural factors, modified by such human effort as provision of irrigation.

15. TABLES 1.4 AND 1.5 : CULTIVATION— ACREAGE NORMS AND PER CAPITA

TABLES 1.4 and 1.5 bring out the relationship between population and cultivation in different

parts of the country. TABLE 1.4 shows the population, the sown area and the irrigated area in 1951 in India, the six zones, and the fifteen sub-regions. In this table, consolidated totals for 'A', 'B' and 'C' categories— which are recorded statistics; and separate totals for the 'D' category— which are estimates— have been given. An estimate of the population of areas of 'D' categories have also been made. It will be seen from this table that areas of 'A', 'B' and 'C' categories cover 633 million acres of land, have a sown area of 256.8 acres and a population of 332.8 millions. The area of 'D' category is 180 million acres. Sown area among them is estimated at 29.9 million acres and the population at 28.5 millions.

In TABLE 1.5, the 'D' category areas are excluded and the information for 'A', 'B' and 'C' categories is given in much greater detail. Population, net area sown, area sown more than once, area irrigated and area irrigated more than once are given separately for 'A', 'B' and 'C' categories, for the zones, states and the natural divisions. The latter part of this table shows cultivation *per capita* and its components by zones, states and divisions. The components of cultivation *per capita* are calculated as follows :

Where 'P' is the population of the area to which cultivation statistics relate and 'A₁' is net area sown; 'A₂' area sown more than once; 'A₃' area irrigated; and 'A₄' area irrigated more than once—

$$(1) \text{ Irrigated Double Crop (col. 24)} \\ = \frac{A_4}{P} \times 100 \text{ cents}$$

$$(2) \text{ Irrigated Single Crop (col. 23)} \\ = \frac{A_3 - A_4}{P} \times 100 \text{ cents}$$

$$(3) \text{ Unirrigated Double Crop (col. 22)} \\ = \frac{A_2 - A_4}{P} \times 100 \text{ cents}$$

$$(4) \text{ Unirrigated Single Crop (col. 21)} \\ = \frac{(A_1 - A_2) - (A_3 - A_4)}{P} \times 100$$

The average cultivated area *per capita* works out at 77 cents for the country as a whole. Of this, 63 cents or about 80% is un-irrigated and 14 cents or 20% is irrigated. Difference in cultivation *per capita* are quite marked even among zones, the variation being from 53 cents in South India to 132 cents in Central India. Differences between natural divisions are of course much greater, the range being from 0.3 acres in Travancore-Cochin to 1.85 acres in Bhopal. In general, one may say, that cultivation *per capita* is lowest in the plains areas with high rainfall where rice is the main crop, higher in the plains with medium or low rainfall, and higher still in the low and medium rainfall areas of Peninsular Hills and Plateau region.

16. TABLES 1.6, 1.7 AND 1.8 : TRENDS IN CULTIVATION PER CAPITA

TABLE 1.6 gives the population, cultivation and trends in cultivation *per capita* for three decades 1921 to 1951, for the states and natural divisions of 'A' and 'B' categories, in which case alone are the agricultural statistics of a sufficient degree of comparability to make such long term comparisons possible.

TABLES 1.7 and 1.8 take the comparison further back and show the trends in population, cultivation and cultivation *per capita* for six decades 1891 to 1951. This analysis could only be done in areas where the agricultural statistics over this long period were of sufficient degree of reliability and also where there had been no appreciable territorial changes. Only 8 divisions and parts of 5 divisions could meet these requirements. The data for individual divisions (or parts of divisions) are given in TABLE 1.8. TABLE 1.7 gives the India and zonal consolidations from this table.

Decline of cultivation *per capita* since 1921 stands out as an unmistakable characteristic of the divisions studied. A discussion of the significance of these figures will be found in Chapter IV of the Report.

17. TABLE 1.9 AND Annexures : MINERAL PRODUCTION

This table and the two *annexures* show the value of the mineral production in India and its distribution by natural sub-regions and divisions, and by important minerals produced.

The figures of these tables are averages of five years 1946 to 1950. They have been compiled from Geological Survey of India's annual publications 'Mineral Production in India' for the years 1947 to 1952. Figures on distribution of production by natural divisions have been arrived at by location of individual producing deposits by natural divisions.

It will be seen from the tables that coal is by far the most important mineral produced in the country. The average value of mineral production during these five years was Rs. 74 crores per year. Of this more than half (Rs. 44 crores) was contributed by coal. Other principal minerals in order of value of output are mica, gold, manganese ore, petroleum, iron ore and copper ore.

TABLE 1.9 shows the value of mineral production in important mineral producing divisions. The divisions have been arranged in order of importance in mineral production. Many of the divisions in which the value of mineral production is very small (e.g., divisions of Upper Gangetic Plains sub-region) have not been shown.

Annexure I shows the distribution of the principal minerals by natural divisions.

Annexure II shows the minerals arranged by the order of value of production.

It will be seen from these tables that mineral production in India is concentrated in a few localities. The most important of these is the North-East Plateau sub-region. The average value of the mineral production of the three divisions of this sub-region amounted to Rs. 49 crores out of the country's total of Rs. 74 crores or nearly two-thirds. The value of production of the Chhota Nagpur division alone averaged Rs. 44 crores. This division alone produces over

four-fifths of the country's coal, about half of the iron ore (the other half comes from the Orissa Inland division of this sub-region), more than half of the mica, all the copper and nearly all the kyanite production of the country. The North East Plateau sub-region as a whole is the sole or leading producer in the country of the following minerals : coal, iron ore, manganese, mica, copper, chromite, graphite etc.

Outside this sub-region, the principal mineral productions are : gold in Mysore; petroleum and tertiary coal in Assam; coal in Madhya Pradesh, Hyderabad and Vindhya Pradesh; ilmenite and monazite from the coastal sands of Travancore-Cochin, mica in North Madras and Rajasthan Plateau divisions and salt all along the sea coasts of the country.

18. TABLES 2.0 TO 2.9 : YIELD RATES

TABLE 2.0 gives the official 'yield rates' of foodgrains—figures obtained from the Directorate of Economics and Statistics, Ministry of Food and Agriculture. TABLES 2.1 to 2.6 give the yield rates as compiled by Dr. V.G. PANSE, Statistical Adviser, Indian Council of Agricultural Research. TABLES 2.7 to 2.9 give the yield rates based on Crop-cutting Experiments carried out by the Indian Council of Agricultural Research.

19. TABLES SERIES 3, 4, 5 AND 6 : POPULATION AND LAND USE — COMPARISONS WITH OTHER COUNTRIES

TABLES 3.0 to 3.2 give the comparative figures for population and land use in India and the World.

TABLES 4.0 to 4.3, 5.0 to 5.3 and 6.0 to 6.2 give figures for population and land use for Great Britain, the United States of America and the Union of Socialist Soviet Republics respectively. A review of the figures in the tables is given in the note preceding each series.

Annexure I to the Introductory Note

[ALL FIGURES RELATE TO NET AREA SOWN]

State	Statistical Category	Figures adopted for 1951	Remarks
Uttar Pradesh	A	State Superintendent's Subsidiary Tables	(1) To the Superintendent's figures 687 thousand acres have been added as follows : 300 thousand acres being the official estimate for 1949-50 for the cadastrally unsurveyed areas in 1·11 Himalayan Uttar Pradesh division. 136 thousand acres in 2·14 East Uttar Pradesh Plain division being difference due to non-inclusion for averaging of figures for merged territories for years prior to the merger. 251 thousand acres in 3·21 Uttar Pradesh Hills and Plateau division due to different base-years. As there were major transfers of enclaves to this division figures for 1949-50 as taken in Paper No. 2, have been accepted.
Bihar	B	State Superintendent's Subsidiary Tables	(2) Figures for decades prior to 1951 do not include figures for merged states. To the Superintendent's figures 795 thousand acres have been added as follows on account of different base-years : 570 thousand acres in 2·12 North Bihar Plain division 225 thousand acres in 2·13 South Bihar Plain division.
Orissa	B	State Superintendent's Subsidiary Tables	The Superintendent's figures represent wider coverage in respect of the merged states than in Paper No. 2, of 1952
West Bengal	B	State Superintendent's Subsidiary Tables	The Superintendent's figures did not include Cooch-Bihar for which 410 thousand acres, being average of the actual figures for the years 1945-46 to 1949-50, have been added.
Assam	B	State Superintendent's Subsidiary Tables	These figures are same as given by the Economic and Statistical Adviser.
Manipur	D	Estimates	The estimate is based in population proportion on the figures for Tripura state.
Sikkim	D	Estimates	Estimates have been made in population proportion on the basis of figures for 1·25 Himalayan West Bengal division as given in Census of India Paper No. 2 of 1952.
Madras	A	State Superintendent's Subsidiary Tables	To the Superintendent's figures, which are same as those supplied by the Economic and Statistical Adviser, an addition of 254 thousand acres has been made as follows, being difference on account of non-inclusion for averaging of figures in respect of merged states for the years prior to merger : 70 thousand acres in 3·54 Madras Deccan division ; and 184 thousand acres in 5·21 South Madras division.

Annexure I to Introductory Note—contd.

State	Statistical Category	Figures adopted for 1951	Remarks
Mysore	A	State Superintendent's Subsidiary Tables	These figures are same as those supplied by the Economic and Statistical Adviser.
Travancore-Cochin	B	-ditto-	-ditto-
Coorg	B	-ditto-	All the three sets of figures for this state are identical.
Bombay	A	State Superintendent's Subsidiary Tables	These figures have a much wider coverage than that of either the Economic and Statistical Advisers figures or the Census of India Paper No. 2 figures.
Saurashtra	D	Estimates	Neither of the three sets of figures have complete coverage. The Census of India Paper No. 2 figures for the reporting area have, therefore, been raised to full cover in the population proportion.
Kutch	C	Census of India Paper No. 2 of 1952	.. .. .
Madhya Pradesh	A	State Superintendent's Subsidiary Tables	(1) The Superintendent's figures exclude the merged states. To these have been added 4,249 thousand acres as follows : 28 thousand acres in 3.24 North-West Madhya Pradesh Division ; and 4,221 thousand acres in 3.32 East Madhya Pradesh division. (2) The Superintendent's figures for the unaffected 3.41 South-West Madhya Pradesh division is same as supplied by the Economic and Statistical Adviser.
Madhya Bharat Hyderabad Bhopal Vindhya Pradesh	C	Census of India Paper No. 2 of 1952	Due to the various changes in the territorial limits during the quinquennium preceding 1951, averaged figures are unrepresentative. Paper No. 2 of 1952 figures, for these states, which relate to 1949-50 only, have therefore been taken.
Rajasthan	D	Estimates	Estimates for three divisions have been made by raising in population proportion the figures for reporting areas in each division ; and for the fourth i.e. 3.11 Rajasthan Hills division (which is entirely non-reporting) on the basis of figures for 3.14 Madhya Bharat Hills division. The estimated figures in thousand acres are as follows : 2.34 East Rajasthan Plain division 6,368 2.41 Dry Area division . . . 3,109 3.11 Rajasthan Hills division . . 3,330 3.12 Rajasthan Plateau division . 2,728 <hr/> 15,535

Annexure I to Introductory Note—concl'd.

<i>State</i>	<i>Statistical Category</i>	<i>Figures adopted for 1951</i>	<i>Remarks</i>
Punjab	A	State Superintendent's Subsidiary Tables	.. .. .
PEPSU	B	-ditto-	.. .. .
Ajmer	B	-ditto-	These figures are same as those supplied by the Economic and Statistical Adviser.
Delhi	B	-ditto-	
Himachal Pradesh and Bilaspur	C	Census of India Paper No. 2 of 1952	

Annexure II

[ALL AREA FIGURES RELATE TO NET AREA]

Zone	Area according to Census of India Paper No. 2 of 1952	Area not included in Paper No. 2 but included in figures for Statistical Categories A, B, C or D, with Code No. of the division	Total
1	2	3	4
I. North India	39,300	..	39,300
II. East India	46,411	5,981	52,392
		$\left. \begin{array}{l} 1.23 - 350 \\ 1.26 - 86 \\ 3.33 - 4,995 \\ 5.11 - 550 \end{array} \right\}$	
III. South India	40,414	..	40,414
IV. West India	45,363	4,740	50,103
		$\left. \begin{array}{l} 3.43 - 580 \\ 3.52 - 164 \\ 4.11 - 445 \\ 4.12 - 3,469 \\ 4.22 - 82 \end{array} \right\}$	
V. Central India	68,916	..	68,916
VI. North-West India	28,025	7,262	35,287
		$\left. \begin{array}{l} 2.34 - 3,057 \\ 2.41 - 141 \\ 3.11 - 3,330 \\ 3.12 - 734 \end{array} \right\}$	
INDIA	<u>268,429</u>	<u>17,983</u>	<u>286,412</u>

to Introductory Note

SOWN AND ARE IN THOUSANDS]

<i>Area included in figures for Statistical Categories A, B, and C</i>	<i>Area included in Statistical Category D, and Code No. of the division</i>	<i>Total</i>	<i>Difference (+) or (-)</i>
5	6	7	8
39,304	..	39,304	-4
51,654	846	52,500	-108
	$\left. \begin{array}{l} \text{I}\cdot\text{23} - 350 \\ \text{I}\cdot\text{25} - 410 \\ \text{I}\cdot\text{26} - 86 \end{array} \right\}$		
40,358	..	40,358	+56
43,095	7,006	50,101	+2
	(4·12—7,006)		
64,814	4,249	69,063	-147
	$\left. \begin{array}{l} \text{3}\cdot\text{24} - 28 \\ \text{3}\cdot\text{32} - 4,221 \end{array} \right\}$		
17,565	17,793	35,358	-71
	$\left. \begin{array}{l} \text{1}\cdot\text{14} - 2,258 \\ \text{2}\cdot\text{34} - 6,368 \\ \text{2}\cdot\text{41} - 3,109 \\ \text{3}\cdot\text{11} - 3,330 \\ \text{3}\cdot\text{12} - 2,728 \end{array} \right\}$		
<u>256,790</u>	<u>29,894</u>	<u>286,684</u>	<u>-272</u>

**Population and
Classification of Land by Topographically**

State and division	Total land area	Land area PER CAPITA	Land area	
			Plains	Plateaus
1	2	3	4	5
INDIA				
Area of states and territories where 1951-Census was taken	753,189,120	2·11	349,525,952	223,226,240
Jammu and Kashmir	59,379,200	13·46	296,832	1,611,392††
TOTAL	812,568,320	2·25	349,822,784	224,837,632
NORTH INDIA				
Uttar Pradesh	72,596,672	1·15	57,234,624	3,395,648
1·11 Himalayan Uttar Pradesh	12,474,880	4·95	864,064	306,048
2·14 East Uttar Pradesh Plain	13,473,728	0·75	13,330,944	142,784
2·21 Central Uttar Pradesh Plain	14,341,440	0·89	14,329,536	11,904
2·22 West Uttar Pradesh Plain	22,230,016	0·98	21,874,688	204,864
3·21 Uttar Pradesh Hills and Plateaus	10,076,608	2·58	6,835,392	2,730,048
EAST INDIA				
Bihar	45,011,072	1·12	25,139,520	13,954,176
2·12 North Bihar Plain†	13,796,672	0·76	13,189,824	354,560
2·13 South Bihar Plain†	9,992,000	0·89	8,906,752	799,296
3·31 Chhota Nagpur	21,222,400	1·95	3,042,944	12,800,320
Orissa	38,486,976	2·63	18,280,512	5,994,304
3·33 Orissa Inland	31,647,424	3·97	12,283,968	5,994,304
5·11 Orissa Coastal	6,839,552	1·02	5,996,544	...
West Bengal	19,696,192	0·79	19,087,744	...
1·25 Himalayan West Bengal	3,118,144	1·54	2,509,696	...
2·11 West Bengal Plain	16,578,048	0·73	16,578,048	...
Assam	54,407,872	6·02	16,291,456	...
1·21 Assam Plains	15,587,072	2·00	14,284,288	...
1·22 Assam Hills	38,820,800	31·35	2,007,168	...
1·23 Manipur	5,518,272	9·55	...	436,992
1·24 Tripura	2,580,288	4·04	1,620,544	...
1·26 Sikkim	1,756,480	12·75	...	...
Chandernagore	2,496	0·06	2,496	...
SOUTH INDIA				
Madras	81,785,600	1·43	48,013,632	13,098,112
3·54 Madras Deccan	16,899,456	3·35	4,285,056	9,349,504
4·23 West Madras	6,957,888	1·02	3,508,416	...
5·12 North Madras	22,458,688	1·56	16,880,128	395,968
5·21 South Madras	35,469,568	1·15	23,340,032	3,352,640

* Estimated population as on 1st March 1951. No census was taken in 1951 in Jammu and Kashmir State.
† Separate figures for Saharsa district which is in North Bihar Plain division are not available. They are included
†† Includes sandy waste and watery/marshy areas which have been excluded in calculating topographically usable area
‡ The figures in brackets represent the topographically usable area *per capita*, if the sandy waste and/or watery areas

Land Use Table 10

usable area, population and average annual rainfall

[ALL AREA FIGURES ARE IN ACRES]

classified as

classified as		Topographically usable area	1951 Census Population	Topographically usable area PER CAPITA	Average annual rainfall IN INCHES
Hills	Mountains	8	9	10	11
6	7	8	9	10	11
147,907,456 2,690,048	32,529,472 54,780,928	499,680,168 4,743,744	356,879,394 4,410,000*	1.40 (1.51)† 1.08	42.50 39.04
150,597,504	87,310,400	504,423,912	361,289,394	1.40	...
4,092,608 3,430,976 150,464 511,168	7,873,792 7,873,792	58,337,024 2,301,888 12,771,520 13,621,952 20,972,672 8,668,992	63,215,742 2,521,987 17,886,802 16,129,890 22,771,252 3,905,811	0.92 0.91 0.71 0.84 0.92 2.22	42.25 67.58 43.71 36.93 33.22 36.47
5,917,376 252,288 285,952 5,379,136	... ... ... ...	35,887,642 12,859,392 9,132,352 13,895,898	40,225,947 18,173,033 11,186,563 10,866,351	0.89 0.71 0.82 1.28	50.63 50.98 43.81 53.62
14,212,160 13,369,152 843,008	... ... ...	25,415,296 19,507,776 5,907,520	14,645,946 7,972,895 6,673,051	1.74 2.45 0.89	58.53 58.77 57.43
288,832 288,832 ...	319,616 319,616 ...	18,221,568 1,831,744 16,389,824	24,810,308 2,030,956 22,779,352	0.73 0.90 0.72	68.70 136.56 55.94
25,452,608 1,302,784 24,149,824	12,663,808 ... 12,663,808	22,473,088 13,831,680 8,641,408	9,043,707 7,805,558 1,238,149	2.48 1.77 6.98	138.93 94.03 156.96
4,872,832	208,448	1,556,352	577,635	2.69	94.56
959,744	...	1,779,456	639,029	2.78	83.35
412,800	1,343,680	149,760	137,725	1.09	140.81
...	...	2,368	49,909	0.05	...
20,307,136 3,264,896 3,180,672 5,182,592 8,678,976	366,720 ... 268,800 ... 97,920	60,531,840 11,899,200 4,141,632 17,628,800 26,862,208	57,016,002 5,037,655 6,819,062 14,433,481 30,725,804	1.06 2.36 0.61 1.22 0.87	42.51 24.05 129.54 38.59 36.72

In the figures for Bhagalpur district in the South Bihar Plain division. (Col. 8). Details of the areas are given in the Annexure to this table. are not excluded altogether. (See para 11 of Introductory Note)

Population and

State and Division	Total land area	Land area PER CAPITA	Land area	
			Plains	Plateaus
I	2	3	4	5
3·53 Mysore	18,872,896	2·08	...	15,426,560
4·24 Travancore-Cochin	5,852,096	0·63	2,600,704	...
4·25 Coorg	1,015,040	4·42	...	113,792
WEST INDIA				
Bombay	71,213,440	1·98	24,260,800††	28,378,560
3·43 Bombay Deccan Northern	28,901,312	2·34	3,052,928	17,717,888
3·52 Bombay Deccan Southern	11,154,880	2·37	...	9,826,496
4·11 Bombay-Gujrat	21,103,616	1·85	17,845,696††	157,248
4·21 Greater Bombay	88,000	0·03	81,600	...
4·22 Bombay-Konkan	9,965,632	2·14	3,280,576††	676,928
4·12 Saurashtra	13,654,592	3·30	12,993,408††	...
4·13 Kutch	10,863,616	19·14	10,321,728††	...
CENTRAL INDIA				
Madhya Pradesh	83,375,424	3·92	20,499,072	40,393,408
3·24 North-West Madhya Pradesh	24,094,080	4·39	3,294,400	12,775,296
3·32 East Madhya Pradesh	43,871,552	4·30	13,095,104	17,665,152
3·41 South-West Madhya Pradesh	15,409,792	2·77	4,109,568	9,952,960
Madhya Bharat	29,786,560	3·74	6,870,912	19,705,536
2·35 Madhya Bharat Lowland	5,223,232	3·09	3,431,552	1,766,080
3·13 Madhya Bharat Plateau	17,580,224	3·81	620,800	15,556,992
3·14 Madhya Bharat Hills	6,983,104	4·24	2,818,560	2,382,464
Hyderabad	52,571,840	2·82	9,461,568	36,715,776
3·42 North Hyderabad	17,796,096	2·99	...	16,239,680
3·51 South Hyderabad	34,775,744	2·74	9,461,568	20,476,096
3·22 Vindhya Pradesh	15,104,512	4·23	2,383,936	11,783,616
3·23 Bhopal	4,402,240	5·26	287,360	3,867,328
NORTH-WEST INDIA				
Rajasthan	83,353,280	5·45	52,056,384††	27,129,600
2·34 East Rajasthan Plain	18,849,216	2·86	6,481,984††	11,425,280
2·41 Rajasthan Dry Area	48,212,288	10·47	44,680,064††	2,916,864
3·11 Rajasthan Hills	7,725,888	3·69	136,448	5,071,616
3·12 Rajasthan Plateau	8,565,888	4·27	757,888	7,715,840
Punjab	23,922,368	1·89	15,928,896††	1,247,168
1·13 Himalayan Punjab	6,368,640	6·48	54,592	151,360
2·31 Punjab Plain	17,553,728	1·51	15,874,304††	1,095,808
1·12 Himachal Pradesh and Bilaspur	6,981,952	6·29	...	...
2·32 Patiala & East Punjab States Union	6,428,032	1·84	5,820,992††	198,656
2·33 Delhi	369,664	0·21	369,664	...
2·36 Ajmer	1,521,856	2·19	...	1,387,008
Andaman and Nicobar Islands	2,057,792	66·44	...	...

NOTE—There is a difference of 1,280 acres or 2 sq. miles between the total area of India shown in this Table (Col. 2) that the figures in this table are based on a later computation of the Surveyor General of India. In the area figures for the

Land Use Table 10—contd.

[ALL AREA FIGURES ARE IN ACRES]

classified as		Topographically usable area	1951 Census Population	Topographically usable area PER CAPITA†	Average annual rainfall IN INCHES
Hills	Mountains				
6	7	8	9	10	11
3,446,336	...	12,431,488	9,074,972	1.37	36.24
3,169,472	81,920	3,267,136	9,280,425	0.35	94.04
901,248	...	310,656	229,405	1.35	106.31
18,574,080	...	47,822,926	35,956,150	1.33 (1.36)	35.65
8,130,496	...	18,221,440	12,364,735	1.47	36.68
1,328,384	...	7,701,888	4,698,479	1.64	29.17
3,100,672	...	16,773,312	11,396,789	1.47 (1.57)	36.13
6,400	...	65,152	2,839,270	0.023 (0.028)	76.50
6,008,128	...	5,061,134	4,656,877	1.09 (1.10)	114.67
661,184	...	12,192,832	4,137,359	2.95 (3.03)	22.65
541,888	...	4,294,144	567,606	7.57 (18.04)	14.38
22,482,944	...	55,390,656	21,247,533	2.61	50.16
8,024,384	...	14,717,888	5,490,410	2.68	47.97
13,111,296	...	28,967,040	10,199,360	2.84	56.24
1,347,264	...	11,705,728	5,557,763	2.11	36.30
3,210,112	...	22,108,928	7,954,154	2.78	37.39
25,600	...	4,590,976	1,691,858	2.71	27.85
1,402,432	...	12,607,936	4,615,661	2.73	37.48
1,782,080	...	4,910,016	1,646,635	2.98	33.00
6,394,496	...	38,123,776	18,655,108	2.04	33.08
1,556,416	...	12,568,704	5,946,404	2.11	30.53
4,838,080	...	25,555,072	12,708,704	2.01	34.73
936,960	...	11,336,704	3,574,690	3.17	43.72
247,552	...	3,235,392	836,474	3.87	48.61
4,167,296	...	44,687,552	15,290,797	2.92 (4.75)	17.84
941,952	...	12,930,816	6,585,367	1.96 (2.34)	23.17
615,360	...	20,664,256	4,603,784	4.49 (10.00)	11.00
2,517,824	...	4,562,752	2,093,396	2.18	30.39
192,160	...	6,529,728	2,008,250	3.25	33.28
1,819,328]	4,926,976	14,165,952]	12,641,205	1.12 (1.34)	37.79
[1,235,712	4,926,976	720,640	982,192	0.73	70.83
583,616	...	13,445,312	11,659,013	1.15 (1.39)	25.81
2,237,440]	4,744,512	796,672	1,109,466	0.72	...
408,384	...	3,221,376	3,493,685	0.92 (1.69)	18.96
...	...	351,168	1,744,072	0.20	21.91
134,848	...	1,073,984	693,372	1.55	20.10
2,057,792	...	514,432	30,071	16.61	123.33

and those shown in Census of India Paper No. 2—1952 (Col. 2 of Table I, pp. 18—19). This difference is due to the fact division also there are minor changes from those given in the Census of India Paper No. 2 of 1952.

Population and

Zone, Region and Sub-region	Total land area	Land area PER CAPITA	Land area	
			Plains	Plateaus
I	2	3	4	5
I. North India	72,596,672	1.15	57,234,624	3,395,648
II. East India	167,459,648	1.86	80,422,272	20,385,472
III. South India	107,525,632	1.42	50,614,336	28,638,464
IV. West India	95,731,648	2.35	47,575,936	28,378,560
V. Central India	185,240,576	3.54	39,502,848	112,465,664
VI. North-West India	122,577,152	3.51	74,175,936	29,962,432
1. Himalayan Region	93,206,528	5.47	21,340,352††	894,400
1.1 Western Himalayan Sub-Region	25,825,472	5.60	918,656††	457,408
1.2 Eastern Himalayan Sub-Region	67,381,056	5.42	20,421,696	436,992
2. Northern Plains Region	188,572,416	1.35	164,870,848††	20,303,104
2.1 Lower Gangetic Plains Sub-Region	53,842,944	0.77	52,008,064	1,296,640
2.2 Upper Gangetic Plains Sub-Region	36,571,456	0.94	36,204,224	216,768
2.3 Trans-Gangetic Plains Sub-Region	49,945,728	1.93	31,978,496††	15,872,832
2.4 The Desert Sub-Region	48,212,288	10.47	44,680,064††	2,916,864
3. Peninsular Hills and Plateau Region	335,084,096	3.09	66,465,920††	197,332,160
3.1 North-West Hills Sub-Region	40,855,104	3.94	4,333,696	30,726,912
3.2 North-Central Hills and Plateau Sub-Region	53,677,440	3.89	12,801,088	31,156,288
3.3 North-East Plateau Sub-Region	96,741,376	3.33	28,422,016	36,459,776
3.4 North Deccan Sub-Region	62,107,200	2.60	7,162,496	43,910,528
3.5 South Deccan Sub-Region	81,702,976	2.59	13,746,624††	55,078,656
4. Western Ghats and Coastal Region	69,500,480	1.74	50,632,128	947,968
4.1 Gujrat Kathiawar Sub-Region	45,621,824	2.83	41,160,832††	157,248
4.2 Malabar-Konkan Sub-Region	23,878,656	1.00	9,471,296††	790,720
5. Eastern Ghats and Coastal Region	64,767,808	1.25	46,216,704	3,748,608
5.1 North Madras and Orissa Coastal Sub-Region	29,298,240	1.39	22,876,672	395,968
5.2 South Madras Sub-Region	35,469,568	1.15	23,340,032	3,352,640

Source : Census of India Paper No. 2 of 1952 (Section XIX.)

Land Use Table 1'0 — *concl'd.*

[ALL AREA FIGURES ARE IN ACRES]

<i>classified as</i>		<i>Topographically usable area</i>	<i>1951 Census Population</i>	<i>Topographically usable area PER CAPITA</i>	<i>Average annual rainfall IN INCHES</i>
<i>Hills</i>	<i>Mountains</i>				
6	7	8	9	10	11
4,092,608	7,873,792	58,337,024	63,215,742	0.92	42.25
52,116,352	14,535,552	105,485,530	90,130,206	1.17	86.16
27,824,192	448,640	76,541,120	75,600,804	1.01	44.82
19,777,152	...	64,309,902	40,661,115	1.58	39.28
33,272,064	...	130,195,456	52,267,959	2.49	43.32
8,767,296	9,671,488	64,296,704	34,972,597	1.84	22.07
38,890,944	32,080,832	31,609,600	17,042,697	1.85	92.00
6,904,128	17,545,280	3,819,200	4,613,645	0.83	50.02
31,986,816	14,535,552	27,790,400	12,429,052	2.24	108.00
3,398,464	...	142,027,968	139,447,952	1.02	26.94
538,240	...	51,155,456	70,075,659	0.73	50.46
150,464	...	34,594,624	38,901,142	0.89	34.45
2,094,400	...	35,613,632	25,867,367	1.38	24.29
615,360	...	20,664,256	4,603,784	4.49	11.00
71,286,016	...	229,023,642	108,598,645	2.11	41.96
5,794,496	...	28,610,432	10,363,942	2.76	34.55
9,720,064	...	37,958,976	13,807,385	2.75	44.21
31,859,584	...	62,370,714	29,038,606	2.15	55.80
11,034,176	...	42,495,872	23,868,902	1.78	35.56
12,877,696	...	57,587,648	31,519,810	1.83	31.98
17,569,664	350,720	46,105,998	39,926,793	1.15	58.29
4,303,744	...	33,260,288	16,101,754	2.07	32.75
13,265,920	350,720	12,845,710	23,825,039	0.54	107.22
14,704,576	97,920	50,398,528	51,832,336	0.97	41.40
6,025,690	...	23,536,320	21,106,532	1.12	45.10
8,678,976	97,920	26,862,208	30,725,804	0.87	36.72

Annexure to Population and Land Use Table 1.0
Location of sandy waste and watery/marshy areas

Zone, State, Division and District	Area IN ACRES
WEST INDIA	7,489,856
Bombay :	1,212,800
BOMBAY-GUJRAT DIVISION	1,129,600
Ahmedabad	67,136
Amreli	6,528
Banaskantha	641,664
Broach	129,664
Kaira	69,952
Surat	211,584
Baroda	3,072
GREATER BOMBAY DIVISION	14,720
BOMBAY-KONKAN DIVISION	68,480
Kolaba	16,640
Thana	51,840
SAURASHTRA DIVISION	332,864
KUTCH DIVISION	5,944,192
NORTH-WEST INDIA	33,302,848
Rajasthan	27,868,416
EAST RAJASTHAN PLAIN DIVISION	2,475,328
Jaipur	246,336
Jhunjhunu	1,187,392
Sikar	1,041,600
RAJASTHAN DRY AREA DIVISION	25,393,088
Barmer	5,100,160
Bikaner	1,387,648
Churu	2,110,592
Ganganagar	4,804,224
Jaisalmer	5,888,896
Jalore	1,651,968
Jodhpur	2,547,584
Nagore	1,902,016
Punjab	2,740,096
PUNJAB PLAIN DIVISION	2,740,096
Ferozepore	770,624
Hissar	1,368,960
Ludhiana	461,248
Rohtak	139,264
Patiala & East Punjab States Union	2,694,336
TOTAL	40,792,704

NOTE— The sandy waste and watery/marshy areas shown in the above statement, though included in the area figures for Plains in column 4 of the Population and Land Use Table 1.0, are not taken into account for arriving at the topographically usable area, given in column 8 of that table. The figure of 1,611,392 acres shown against Jammu and Kashmir in column 5 — Plateau, in Table 1.0 similarly includes 211,072 acres which are sandy wastes.

Population and Land Use Table 1.1
Regions, sub-regions and divisions classified by rainfall (Rainfall belts)

Regions, Sub-Regions and Divisions	Area (IN '000 ACRES) having an annual average rainfall of								
	Total area (IN '000 ACRES)	Average Annual rainfall (IN INCHES)	Above 75" (Blue belt)	Between 50-75" (Dark Green belt)	Between 30-50" (Light Green belt)	Between 15-30" (Brown belt)	Between 10-15" (Yellow belt)	(Below 10" Yellow belt)	Average number of rainy days
1	2	3	4	5	6	7	8	9	10
INDIA (States and territories where the 1951 Census was taken)	753,189	42	83,359*	167,843*	254,342*	187,990*	42,228*	15,369*	..
1. <i>Himalayan Region</i>	93,206	92	60,529	23,442	9,235	...	...	...	...
1.1 Western Himalayan Sub-Region	25,825	59	3,495	13,420	8,910	...	...	...	...
1.11 Himalayan U.P. Division	12,475	68	2,859	7,753	1,863	...	...	...	70
1.12 Himachal Pradesh and Bilaspur Division	6,982	N.A.	...	3,752	3,230	...	...	...	N.A.
1.13 Himalayan Punjab Division	6,368	71	636	1,915	3,817	...	...	...	75
1.2 Eastern Himalayan Sub-Region	67,381	108	57,034	10,022	325	...	...	...	...
1.21 Assam Plains Division	15,587	94	12,072	3,515	...	...	...	...	112
1.22 Assam Hills Division	38,821	157	34,748	3,748	325	...	...	...	N.A.
1.23 Manipur Division	5,518	95	2,759	2,759	...	...	...	...	N.A.
1.24 Tripura Division	2,580	83	2,580	...	...	...	...	...	100
1.25 Himalayan West Bengal Division	3,118	137	3,118	...	...	...	...	...	109
1.26 Sikkim Division	1,757	141	1,757	...	...	...	...	...	N.A.
2. Northern Plains Region	188,672	27	640	27,821	55,828	54,813	34,101	15,369	...
2.1 Lower Gangetic Plains Sub-Region	53,843	50	640	24,762	28,441	...	...	...	...
2.11 West Bengal Plain Division	16,580	56	...	16,580	...	...	...	...	73
2.12 North Bihar Plain Division	13,797	51	640	4,871	8,286	...	...	...	55
2.13 South Bihar Plain Division	9,992	44	...	1,369	8,623	...	...	...	54
2.14 East U.P. Plain Division	13,474	44	...	1,942	11,532	...	...	...	50
2.2 Upper Gangetic Plains Sub-Region	36,571	34	...	3,059	24,805	8,707	...	...	...
2.21 Central U.P. Plain Division	14,341	37	...	...	14,341	...	...	...	45
2.22 West-U.P. Plain Division	22,230	33	...	3,059	10,464	8,707	...	...	40
2.3 Trans Gangetic Plains Sub-Region	49,946	24	...	...	2,582	41,239	6,125	...	...
2.31 Punjab Plain Division	17,554	26	...	...	1,649	11,831	4,074	...	29
2.32 PEPSU Division	6,428	19	...	...	...	5,622	806	...	N.A.
2.33 Delhi Division	370	22	...	...	...	370	...	...	28
2.34 East Rajasthan Plain Division	18,849	23	...	...	...	17,604	1,245	...	34
2.35 Madhya Bharat Lowland Division	5,223	28	...	...	933	4,290	...	...	36
2.36 Ajmer Division	1,522	20	...	...	...	1,522	...	...	26
2.4 The Desert Sub-Region	48,212	11	...	...	...	4,867	27,976	15,369	...
2.41 Rajasthan Dry Area Division	48,212	11	...	...	...	4,867	27,976	15,369	13

*Exclude Andaman and Nicobar Island.

Population and Land-Use Table 1.1—contd.

Region, Sub-Region and Division	Total Area (IN '000 ACRES)	Average annual rainfall (IN INCHES)	Area (IN '000 ACRES) having an annual average rainfall of						Average number of rainy days
			Above 75" (Blue belt)	Between 50—75" (Dark Green belt)	Between 30—50" (Light Green belt)	Between 15—30" (Brown belt)	Between 10—15" (Yellow belt)	Below 10" (Yellow belt)	
1	2	3	4	5	6	7	8	9	10
3. Peninsular Hills & Plateau Region	335,084	42	2,402	104,219	130,536	97,927	...	...	...
3.1 North-West Hills Sub-Region	40,855	35	...	...	23,431	17,424	...	...	...
3.11 Rajasthan Hills Division	7,726	30	...	...	2,496	5,230	...	...	34
3.12 Rajasthan Plateau Division	8,566	33	...	...	2,241	6,325	...	...	37
3.13 Madhya Bharat Plateau Division	17,580	37	...	...	14,350	3,230	...	...	42
3.14 Madhya Bharat Hills Division	6,983	33	...	...	4,344	2,639	...	...	44
3.2 North Central Hills & Plateau Sub-Region	53,678	44	...	13,104	39,593	981	...	...	...
3.21 U.P. Hills and Plateau Division	10,077	36	...	...	9,626	451	...	...	45
3.22 Vindhya Pradesh Division	15,105	44	...	5,033	10,072	...	...	...	55
3.23 Bhopal Division	4,402	49	...	...	4,402	...	...	...	58
3.24 North-West Madhya Pradesh Division	24,094	48	...	8,071	15,493	530	...	...	58
3.3 North-East Plateau Sub-Region	96,741	56	...	87,217	9,524	...	...	...	...
3.31 Chhota Nagpur Division	21,222	54	...	15,252	5,970	...	...	...	70
3.32 East Madhya Pradesh Division	43,872	56	...	42,691	1,181	...	...	...	63
3.33 Orissa Inland Division	31,647	59	...	29,274	2,373	...	...	...	75
3.4 North Deccan Sub-Region	62,107	36	1,394	2,890	30,305	27,518	...	...	...
3.41 South-West Madhya Pradesh Division	15,410	36	...	819	13,512	1,079	...	...	50
3.42 North Hyderabad Division	17,796	30	...	...	12,596	5,200	...	...	48
3.43 Bombay Deccan Northern Division	28,901	37	1,394	2,071	4,197	21,239	...	...	44
3.5 South Deccan Sub-Region	81,703	32	1,008	1,008	27,683	52,004	...	...	...
3.51 South Hyderabad Division	34,776	35	...	...	19,716	15,060	...	...	51
3.52 Bombay Deccan Southern Division	11,155	29	353	353	1,909	8,540	...	...	50
3.53 Mysore Division	18,873	36	655	655	4,542	13,021	...	...	56
3.54 Madras Deccan Division	16,899	24	...	...	1,516	15,383	...	...	39
4. Western Ghats and Coastal Region	69,501	58	19,788	4,959	11,919	24,708	8,127	...	...
4.1 Gujrat Kathiawar Sub-Region	45,622	33	431	1,723	10,633	24,708	8,127	...	...
4.11 Bombay-Gujrat Division	21,103	36	431	1,723	10,633	8,316	...	...	44
4.12 Saurashtra Division	13,655	23	...	...	...	13,655	...	...	N.A.
4.13 Kutch Division	10,864	14	...	...	...	2,737	8,127	...	17
4.2 Malabar Konkan Sub-Region	23,879	107	19,357	3,236	1,286	...	...	...	...
4.21 Greater Bombay Division	88	76	88	...	...	...	...	...	74
4.22 Bombay-Konkan Division	9,966	115	8,142	1,277	547	...	...	...	95
4.23 West Madras Division	6,958	129	6,486	474	...	...	...	...	121
4.24 Travancore-Cochin Division	5,852	94	4,134	97	739	...	...	...	118
4.25 Coorg Division	1,015	106	507	508	...	...	...	...	118

Population and Land Use Table 1.1 —concl'd.

Regions, Sub-Regions & Divisions	Total area (in '000 acres)	Average annual rainfall in inches	Area (in '000 acres) having an annual average rainfall of						
			Above 75" (Blue belt)	Between 50—75" (Dark Green belt)	Between 30—50" (Light Green belt)	Between 15—30" (Brown belt)	Between 10—15" (Yellow belt)	Below 10" (Yellow belt)	Average number of rainy days
1	2	3	4	5	6	7	8	9	10
5. Eastern Ghats and Coastal Region	64,768	41	...	7,402	40,824	10,542	...	...	11
5.1 North Madras and Orissa Coastal Sub-Region	29,298	45	...	6,446	19,304	3,548	...	...	...
5.11 Orissa Coastal division	6,840	57	...	6,113	727	...	...	...	71
5.12 North Madras division	22,458	39	...	333	18,577	3,548	...	...	50
5.2 South Madras Sub-Region	35,470	37	...	956	27,520	6,994	...	...	49
5.21 South Madras division	35,470	37	...	956	27,520	6,994	...	...	49
Andaman and Nicobar Islands	2,058	123	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	177

Annexure I to Population and Land Use Table 1.1

Percentage of total area falling in different Rainfall Belts

	Above 75" (Blue Belt)	Between 50—70" (Dark Green Belt)	Between 30—50" (Light Green Belt)	Between 15—30" (Brown Belt)	Between 10—15" (Yellow Belt)	Below 10" (Yellow Belt)
1	2	3	4	5	6	7
India (1951 Census Area)	11	22	34	25	6	2
Himalayan Region	65	25	10	...	...	...
Northern Plains Region	...	15	30	29	18	8
Peninsular Hills and Plateau Region	1	31	39	29	...	...
Western Ghats and Coastal Region	28	7	17	36	12	...
Eastern Ghats and Coastal Region	...	12	72	16	...	...
Andaman and Nicobar Islands	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Annexure II to Population and Land Use Table I·I

Percentage of Area of Yellow and Brown Belts in various Sub-Regions to total land area of the Sub-Region and percentage of the area of the Belt falling in the Sub-Region to total area of the Belt in India.

1	2	3	4	5	6
Area in 000's of Acres	Percentage of total land of sub-Regions	Percentage of total area of the belt	Estimated Population of the area in the belt in 000's	Districts in the Belt	
THE YELLOW BELT					
1. Desert Sub-Region (2·4)	57,597	40	100·0	7,300	
2. Gujrat Kathiawar Sub-Region (4·1)	43,345	90	75·3	3,900	Ganganagar, Bikaner, Churu, Jodhpur, Barmer, Jaisalmer, and parts of Jalore, Pali & Nagore (Rajasthan).
3. Trans-Gangetic Plains Sub-Region (2·3)	8,127	18	14·1	600	Part of Kutch.
	6,125	12	10·6	2,800	Part of Ferozepur and Hissar, (Punjab); Part of PEPSU; Part of Sikar and Jhunjhunu (Rajasthan).
THE BROWN BELT					
(i) <i>The Northern Brown Belt</i>	187,990	39	100·0	88,300	
1. Desert Sub-Region (2·4)	97,926	26	52·1	50,200	
2. Gujrat Kathiawar Sub-Region (4·1)	4,867	10	2·6	1,000	Parts of Jalore, Pali, Nagore (Rajasthan).
3. Trans-Gangetic Plains Sub-Region (2·3)	24,708	54	13·2	9,100	Whole of Saurashtra Amreli and parts of Banaskantha; Sabarkantha, Mehsana, Ahmedabad, Kaira (Bombay), Part of Kutch.
4. North West Hills (3·1)	45,239	83	21·9	22,600	Parts of Ambala, Gurdaspur, Hoshiarpur, Ferozepur, Hissar; Whole of Amritsar, Jullundur, Ludhiana, Karnal, Rohtak, Gurgaon, (Punjab). Part of PEPSU; Delhi. Part of Sikar and Jhunjhunu; Jaipur, Tonk, Sawai Madhopur, Bharatpur, Alwar, Bhilwara (Rajasthan).
5. Upper Gangetic Plain (2·2)					Bhind. Parts of Gird and Morena; Ajmer. (Madhya Bharat)
6. North Central Hills and Plateau (3·2)	17,424	43	9·3	4,400	Parts of Udaipur, Ganganagar, Banswara, Sirohi, Kota, Whole of Chittorgarh, Bundi, Jhalawar (Rajasthan). Parts of Shivpuri, Mandasaur, Ratlam, Dhar, Jabua, Nimar (Madhya Bharat).
(ii) <i>The Central Brown Belt</i>	8,707	24	4·6	10,300	Bulandshahr, Aligarh, Mathura, Agra and parts of Saharanpur, Muzaffarnagar, Meerut, Mainpuri, Etah, Etawah (U.P.).
1. South Deccan Sub-Region (3·5)	981	2	0·5	2,800	Part of Jalau (U. P.) Part of Nimar (Madhya Pradesh).
2. North Deccan (3·4)	70,522	55	42·3	31,000	Mahbubnagar, Raichur, and parts of Hyderabad, Gulbarga, Medak & Nalgonda (Hyderabad); Bijapur, and parts of Belgaum and Dharwar (Bombay)
3. South Madras (5·2)	52,004	64	27·7	19,900	Tumkur, Mandya, Chitaldrug, and parts of Bangalore, Kolar, Mysore, Hassan, Chickmagalur, and Shimoga (Mysore). Bellary, Anantapur, Kurnool and parts of Cuddapah (Madras).
4. North Madras and Orissa Coastal (5·1)	27,518	44	14·6	11,100	Parts of Amravati, Buldana, Akola (M.P.). Parts of Aurangabad, Bhir, Osmanabad (Hyderabad) Ahmednagar and Sholapur and parts of West Khandesh, East Khandesh, Nasik, Poona, Satara North, Satara South, and Kolhapur (Bombay).
(iii) <i>The Southern Brown Belt</i>	10,542	16	6·6	7,100	
1. South Madras (5·2)	6,994	20	3·7	5,300	Parts of Chittoor, Salem, Coimbatore, Trichirapalli, Madura, Ramanathapuram, Tirunelveli. (Madras).
2. North Madras and Orissa Coastal (5·1)	3,548	12	1·9	1,800	Parts of Guntur, Nellore (Madras).

Annexure III to Population and Land Use Table I·I

Periods of successive years of deficient rainfall* During 1891—1920 and 1921—1950

Rainfall Division	Corresponding Natural Division	Number of years of deficient rainfall during thirty year period		Average deficiency during years of deficient rainfall		Number of periods of 2 or more successive years of deficient rainfall		Number of periods of 3 or more successive years of deficient rainfall	
		1891-1920	1921-1950	1891-1920	1921-1950	1891-1920	1921-1950	1891-1920	1921-1950
		1	2	3	4	5	6	7	8	9	10
Assam	Assam Hills Assam Plains Manipur	4	1	16.5	12.0	...	...	...	...
Bengal	Himalayan West Bengal West Bengal Plain Tripura	7	5	16.7	12.2	2	...	...	...
Orissa	Orissa Inland Orissa Coastal	6	5	17.7	17.6	1	2	...	...
Chhota Nagpur	Chhota Nagpur	6	5	29.8	12.0	1	1	1	...
Bihar	North Bihar Plain South Bihar Plain	6	6	25.5	20.1	...	1	...	...
Uttar Pradesh East	East Uttar Pradesh Plain Central Uttar Pradesh Plain Uttar Pradesh Hills and Plateau	10	7	20.8	20.7	3	3	...	...
Uttar Pradesh West	Himalayan Uttar Pradesh West Uttar Pradesh Plain	10	8	30.4	24.0	...	2	...	1
Punjab East & North	Himalayan Punjab Punjab Plain PEPSU Delhi	15	12	28.8	18.3	3	3	1	2
Rajputana West	East Rajasthan Plains Rajasthan Dry Area Rajasthan Hills Rajasthan Plateau	14	12	44.8	25.8	4	4	1	1
Rajputana East	Ajmer	13	8	31.4	21.9	2	2	...	...
Gujarat	Bombay Gujarat Saurashtra Kutch	9	8	45.7	29.4	1	1	...	1
Central India West	Vindhya Pradesh Madhya Bharat	11	5	23.0	17.6	1	1	...	1
Central India East	Bhopal	11	10	28.0	19.2	3	3	...	2
Berar		12	6	25.9	17.0	4	1	1	...
Madhya Pradesh West	North-West Madhya Pradesh South-West Madhya Pradesh	8	2	25.5	22.0	...	...	...	...
Madhya Pradesh East	East Madhya Pradesh	6	4	20.7	19.8	...	...	...	...
Konkan	Bombay Konkan Greater Bombay	9	3	26.7	20.0	1	...	1	...
Bombay Deccan	Bombay Deccan Northern Bombay Deccan Southern	9	5	28.7	20.0	2	1	...	1
Hyderabad North	North Hyderabad	12	13	26.5	19.8	3	4	2	1
Hyderabad South	South Hyderabad	13	13	27.0	21.2	3	5	1	...
Mysore	Mysore	10	8	21.4	29.1	1	...	...	...
Malabar	Travancore-Cochin West Madras	8	6	19.6	16.8	1	2	1	...
Madras South East	South Madras	9	14	27.0	20.8	2	3	1	1
Madras Deccan	Madras Deccan	10	16	30.9	22.6	...	4	...	3
Madras Coast North	North Madras	6	4	22.3	17.0	...	...	...	...

*NOTE :— The years in which the average annual rainfall was below the normal by 11% or more have been treated as years of deficiency.

**Population and
Classification**

Zone/Sub-Region	Classification of area				
	Total land area according to the Surveyor General	Total Area for which village papers are available	Area under forests	Area not available for cultivation	Other unutilized land excluding fallow land
I	2	3	4	5	6
INDIA	812,570	623,416	93,385	99,572	102,665
I—North India	72,582	72,074	7,566	12,035	10,530
II—East India	167,460	120,955	18,082	17,639	29,755
III—South India	107,526	104,545	17,452	20,651	14,177
IV—West India	95,750	81,002	10,220	10,810	5,291
V—Central India	185,216	182,462	36,427	23,825	32,962
VI—North-West India	181,978	62,377	3,638	14,613	9,951
<i>Andaman & Nicobar Islands</i>	<i>2,058</i>	<i>Not available</i>			
SUB-REGIONS					
1·1 Western Himalayan	85,190	28,162	8,753	10,845	2,837
1·2 Eastern Himalayan	67,384	39,073	6,550	4,686	18,887
2·1 Lower Gangetic Plains	53,841	53,607	2,365	6,412	5,837
2·2 Upper Gangetic Plains	36,570	36,583	677	5,468	5,413
2·3 Trans-Gangetic Plains	50,585	38,136	1,810	6,092	5,291
2·4 The Desert	48,198	8,063	9	731	2,191
3·1 North West Hills	40,212	27,907	1,904	6,715	7,128
3·2 North Central Hills and Plateau	53,677	52,593	10,055	6,568	14,786
3·3 North East Plateau	95,195	77,130	23,949	8,192	18,011
3·4 North Deccan	62,088	61,622	7,455	6,331	1,595
3·5 South Deccan	81,735	80,621	12,348	14,627	5,301
4·1 Gujrat-Kathiawar	45,640	31,469	1,367	5,222	4,570
4·2 Malabar Konkan	23,882	23,052	6,569	3,312	2,457
5·1 North Madras & Orissa Coastal	30,845	30,059	4,302	7,390	3,829
5·2 South Madras	35,469	35,337	5,270	6,979	4,531

NOTE:— Figures in this table are taken from Census of India, Paper No. 2 of 1952 and no adjustment for non-reporting areas has been made.

Land Use Table 1.2

of land area

[FIGURES IN COLS. 2—8 ARE IN THOUSANDS OF ACRES]

column 3		Area per 1000 acres of column 3 in Zone/Sub-Region			Area in Zone/Sub-Region per 1000 acres of total area in India for which 'village papers' are available		Uncultivated land excluding fallow land per 1000 acres of net area sown in Zone/Sub-Region
Fallow land	Net area sown	Under forests or otherwise not available for cultivation-	Uncultivated land other than fallow land	Net area sown plus fallow land	Under forests or otherwise not available for cultivation	Uncultivated land other than fallow land	
7	8	9	10	11	12	13	14
59,365	268,429	310	164	526	1,000	1,000	382
2,644	39,300	272	146	582	102	103	268
9,069	46,411	295	246	459	185	290	641
11,851	40,414	364	136	500	197	138	351
9,319	45,363	260	65	675	109	51	117
20,332	68,917	330	181	489	312	321	478
6,150	28,025	293	159	548	95	97	355
<i>Not available</i>							
557	5,169	696	101	203	102	28	549
2,032	6,917	288	483	229	58	184	2,731
3,440	35,552	164	109	727	45	57	164
1,336	23,689	168	148	684	32	53	229
3,399	21,544	207	139	654	41	52	246
2,165	2,968	92	272	636	4	21	738
1,260	10,900	309	255	436	45	69	654
3,350	17,833	316	281	403	86	144	829
4,991	21,987	417	233	350	167	175	819
9,268	36,973	224	26	750	71	15	43
12,441	35,904	334	66	600	140	52	148
3,455	16,855	209	145	646	34	45	271
3,376	7,338	429	106	465	51	24	335
3,133	11,405	389	127	484	61	37	336
5,163	13,394	347	128	525	63	44	338

Annexure to Population

Classification of Land Area

(Estimates based on Census)

1	2	3	4
	<i>Total Population (Estimates based on 1951 Census figures)</i>	<i>Land Area for which village papers are available</i>	<i>Classification Area under forests</i>
The Yellow Belt.			
Tracts with Good Irrigation	5,200	9,702	14
Tracts with Fair Irrigation	2,100	7,206	125
TOTAL—Yellow Belt	7,300	16,908	139
The Brown Belt			
(i) Northern Brown Belt.			
Tracts with Good Irrigation	24,600	25,341	168
Tracts with Fair Irrigation	19,300	44,306	2,456
Tracts with Poor Irrigation	6,300	14,166	1,085
<i>Northern Brown Belt</i>	50,200	83,813	3,709
(ii) Central Brown Belt.			
Tracts with Good Irrigation	800	2,474	714
Tracts with Fair Irrigation	16,600	37,581	3,805
Tracts with Poor Irrigation	13,600	40,063	5,319
<i>Central Brown Belt</i>	31,000	80,118	9,838
(iii) Southern Brown Belt.			
Tracts with Good Irrigation	5,400	8,106	1,235
Tracts with Fair Irrigation	1,700	2,404	362
<i>Southern Brown Belt</i>	7,100	10,510	1,597
TOTAL—Brown Belt	88,300	174,441	15,144

Note :—

Tracts with good irrigation—Where the percentage of irrigated area to the total area sown exceeds 20%.

Tracts with fair irrigation—Where the percentage of irrigated area to the total area sown is between 5 and 20%

Tracts with poor irrigation—Where the percentage of irrigated area to the total area sown is less than 5%.

and Land Use Table 1.2
in Yellow and Brown Belts.

of India Paper No. 2 of 1952).

[AREA FIGURES IN THOUSANDS OF ACRES]

of area in column 3

<i>Area not available for cultivation</i>	<i>Other uncultivated land excluding fallow land</i>	<i>Fallow land</i>	<i>Net area sown</i>	<i>Area sown more than once</i>	<i>Gross area sown</i>	<i>Area irrigated</i>
5	6	7	8	9	10	11
825	2,271	2,365	4,227	185	4,412	1,483
1,325	1,298	1,532	2,926	381	3,307	412
2,150	3,569	3,897	7,153	566	7,719	1,895
3,330	3,343	2,351	16,149	3,285	19,434	8,091
9,254	6,897	3,852	21,847	2,571	24,418	2,297
3,119	2,375	806	6,781	360	7,141	208
15,703	12,615	7,009	44,777	6,216	50,993	10,596
322	493	256	689	55	744	181
7,403	1,653	5,759	18,961	510	19,471	1,904
3,634	1,452	4,395	25,263	515	25,778	829
11,359	3,598	10,410	44,913	1,080	45,993	2,914
1,655	1,112	1,418	2,686	444	3,130	914
282	209	261	1,290	153	1,443	258
1,937	1,321	1,679	3,976	597	4,573	1,172
28,999	17,534	19,098	93,666	7,893	101,559	14,682

Population and Cropping

AREA SOWN TO :

Zone/Sub-Region	ALL FOOD GRAINS			RICE			WHEAT		
	Area in '000 acres	Area per 1000 acres of gross area sown in sub- region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in sub- region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in sub- region	Area per 1000 acres in India
		2	3		4	5		6	7	8	9	10
INDIA	237,211	779	1,000	69,800	229	1,000	24,254	80	1,000
I—North India	42,630	873	180	8,239	169	118	8,393	172	346
II—East India	48,570	868	205	33,217	594	476	1,757	31	72
III—South India	31,764	694	134	12,493	273	179	15	...	1
IV—West India	33,220	709	140	3,182	68	46	2,301	49	95
V—Central India	55,827	754	235	11,581	156	166	6,127	83	253
VI—North-West India	25,199	765	106	1,088	33	15	5,661	172	233
Andaman & Nicobar Islands	Not available								
SUB-REGIONS									
1.1 Western Himalayan	5,899	917	25	1,251	195	18	1,666	259	69
1.2 Eastern Himalayan	5,543	703	23	5,157	654	74	7	1	...
2.1 Lower Gangetic Plains	40,215	894	170	21,305	473	305	3,151	70	130
2.2 Upper Gangetic Plains	24,934	848	105	3,643	124	52	5,479	186	226
2.3 Trans-Gangetic Plains	18,080	745	80	401	16	6	4,192	165	173
2.4 The Desert	2,346	780	10	5	2	...	143	48	6
3.1 North West Hills	8,867	767	37	268	23	4	2,278	197	94
3.2 North Central Hills and Plateau	16,783	850	71	2,486	126	36	3,734	189	154
3.3 North East Plateau	23,484	903	99	14,866	571	213	405	16	17
3.4 North Deccan	25,725	683	108	766	20	11	1,540	41	63
3.5 South Deccan	25,845	701	109	2,779	75	40	725	20	30
4.1 Gujrat Kathiawar	11,543	660	49	1,126	64	16	928	53	38
4.2 Malabar Konkan	4,421	543	19	3,684	452	53	1	...	...
5.1 North Madras and Orissa Coastal	11,312	806	47	7,013	500	100	3	...	...
5.2 South Madras	11,315	724	48	5,050	323	72	2	...	...

*Figures in this table have been taken from Census of India Paper No. 2 of 1952 and no adjustments for non-reporting areas have been made.

Land Use Table 1.3

Pattern*

AREA SOWN TO :											
BARLEY			Major millets : JOWAR, BAJRA, RAGI			ALL OTHER FOOD-GRAINS (small millets, maize, gram, pulses)			FOOD CROPS OTHER THAN FOOD-GRAINS		
Area in '000 acres	Area per 1000 acres of gross area sown in sub-region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in sub-region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres in sub-region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in sub-region	Area per 1000 acres in India
11	12	13	14	15	16	17	18	19	20	21	22
7,772	25	1,000	62,264	205	1,000	73,121	240	1,000	13,381	44	1,000
4,815	98	620	5,505	113	88	15,678	321	214	3,041	62	227
1,119	20	144	996	18	16	11,481	205	157	3,272	58	245
1	...	...	11,016	241	177	8,239	180	113	3,152	69	236
29	...	4	21,395	457	344	6,313	135	86	1,183	25	88
568	8	73	16,419	222	264	21,132	285	289	1,269	17	95
1,240	38	159	6,933	210	111	10,277	312	141	1,463	44	109
Not available											
451	70	58	586	91	9	1,945	302	27	162	25	12
2	...	...	7	1	...	370	47	51	800	101	60
2,620	58	337	574	13	9	12,566	279	172	2,824	63	211
2,695	92	347	4,035	137	65	9,081	309	124	2,039	69	152
975	38	126	5,377	211	86	8,035	315	110	1,243	49	93
102	34	13	1,284	426	21	812	270	11	43	14	3
88	8	11	3,422	296	55	2,810	243	38	268	23	20
653	33	84	2,424	123	39	7,486	379	102	270	14	20
144	6	19	1,051	40	17	7,019	270	96	459	18	35
10	...	1	16,604	441	267	6,806	181	93	887	24	66
11	...	1	13,426	364	216	8,905	242	122	1,152	31	86
20	1	3	7,158	410	115	2,312	132	32	420	24	31
1	...	...	274	34	4	461	57	6	1,454	179	109
1	...	...	2,101	150	34	2,193	156	30	693	49	52
...	...	...	3,941	252	63	2,321	148	32	667	43	50

Population and

Cropping

AREA SOWN TO :

Zone/Sub-Region	OIL SEEDS			FODDER CROPS		
	Area in '000 acres	Area per 1000 acres of gross area sown in sub-region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in sub-region	Area per 1000 acres in India
I	23	24	25	26	27	28
INDIA	24,540	81	1,000	11,261	37	1,000
I—North India	816	17	33	1,850	38	164
II—East India	1,936	35	79	42	1	4
III—South India	6,921	151	282	683	15	61
IV—West India	4,294	92	175	4,493	96	399
V—Central India	9,074	122	370	888	12	79
VI—North-West India	1,499	46	61	3,305	100	293
<i>Andaman & Nicobar Islands</i>			<i>Not available</i>			
SUB-REGIONS						
1·1 Western Himalayan	186	29	8	61	10	5
1·2 Eastern Himalayan	428	54	17	8	1	1
2·1 Lower Gangetic Plains	981	22	40	164	4	15
2·2 Upper Gangetic Plains	394	14	16	1,676	57	149
2·3 Trans-Gangetic Plains	1,125	44	46	3,042	119	270
2·4 The Desert	236	78	10	146	49	13
3·1 North West Hills	950	82	39	109	9	10
3·2 North Central Hills and Plateau	1,641	83	67	716	36	64
3·3 North East Plateau	1,751	67	71	76	3	7
3·4 North Deccan	4,569	121	186	1,941	52	172
3·5 South Deccan	6,308	171	257	422	11	37
4·1 Gujrat Kathiawar	1,209	69	49	1,989	114	177
4·2 Malabar Konkan	1,200	147	49	444	54	39
5·1 North Madras and Orissa Coastal	1,137	81	46	260	19	23
5·2 South Madras	2,425	155	99	205	13	18

Land Use Table 1.3—concl'd.

Pattern

AREA SOWN TO :											
COTTON			JUTE AND OTHER FIBRES EXCLUDING COTTON			TEA, COFFEE, TOBACCO AND OTHER MISCELLANEOUS CROPS			ALL CROPS		
Area in '000 acres	Area per 1000 acres of gross area sown in sub-region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in sub-region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in sub-region	Area per 1000 acres in India	Area in '000 acres	Area per 1000 acres of gross area sown in sub-region	Area per 1000 acres in India
29	30	31	32	33	34	35	36	37	38	39	40
11,947	39	1,000	2,049	7	1,000	3,980	13	1,000	304,369	1,000	1,000
148	3	12	223	5	109	111	2	28	48,820	1,000	160
80	1	7	984	18	480	1,041	19	261	55,926	1,000	184
1,637	36	137	204	4	100	1,440	31	362	45,802	1,000	151
2,997	64	251	86	2	42	544	12	137	46,817	1,000	154
6,414	87	537	501	7	244	100	1	25	74,073	1,000	243
670	20	56	51	2	25	743	23	187	32,930	1,000	108
Not available											
28	4	2	13	2	6	82	13	21	6,432	1,000	21
54	7	4	278	35	136	777	99	195	7,888	1,000	26
8	...	1	691	15	337	112	3	28	44,994	1,000	148
146	5	12	125	4	61	74	3	19	29,388	1,000	97
570	22	48	49	2	24	466	18	117	25,475	1,000	83
41	14	3	1	...	...	197	65	50	3,011	1,000	10
1,249	108	105	60	5	30	52	5	13	11,556	1,000	38
285	14	24	74	4	36	9	...	2	19,778	1,000	65
62	2	5	54	2	26	147	6	37	26,033	1,000	86
4,213	112	353	270	7	132	83	2	21	37,689	1,000	124
2,515	68	211	163	4	80	443	12	111	36,848	1,000	121
1,896	109	159	92	2	16	387	22	97	17,477	1,000	57
16	2	1	7	1	3	602	74	151	8,144	1,000	27
82	6	7	222	16	108	317	23	80	14,023	1,000	46
779	50	65	10	1	5	231	15	58	15,633	1,000	51

Annexure to Population

Cropping Pattern of Areas in

(Estimates based on Census)

AREA SOWN TO :					
	All food-grains	Rice	Wheat and barley	Major millets (Sowar, bajra and ragi)	All other foodgrains (Small millets, maize, gram and pulse)
1	2	3	4	5	6
The Yellow					
Tracts with Good Irrigation	3,253	37	565	1,398	1,253
Tracts with Fair Irrigation	2,671	5	238	1,289	1,139
The Yellow Belt	5,924	42	803	2,687	2,392
(i) Northern Brown Belt					
The Brown					
Tracts with Good Irrigation	14,700	489	5,019	3,485	5,707
Tracts with Fair Irrigation	18,360	162	2,883	10,531	4,784
Tracts with Poor Irrigation	5,044	280	1,010	2,121	1,633
<i>Northern Brown Belt</i>	<i>38,104</i>	<i>931</i>	<i>8,912</i>	<i>16,137</i>	<i>12,124</i>
(ii) Central Brown Belt					
Tracts with Good Irrigation	513	99	1	259	154
Tracts with Fair Irrigation	14,383	1,149	312	9,672	3,450
Tracts with Poor Irrigation	17,102	510	1,067	9,985	5,540
<i>Central Brown Belt</i>	<i>32,198</i>	<i>1,758</i>	<i>1,380</i>	<i>19,916</i>	<i>9,144</i>
(iii) Southern Brown Belt					
Tracts with Good Irrigation	2,084	647	...	1,030	407
Tracts with Fair Irrigation	975	262	...	400	313
<i>Southern Brown Belt</i>	<i>3,059</i>	<i>909</i>	<i>...</i>	<i>1,430</i>	<i>720</i>
THE BROWN BELTS	73,361	3,598	10,292	37,483	21,988

NOTE :—

Tracts with good irrigation .—Where the percentage of irrigated area to the total area sown exceeds 20%.

Tracts with fair irrigation .—Where the percentage of irrigated area to the total area sown is between 5% and 20%.

Tracts with poor irrigation .—Where the percentage of irrigated area to the total area sown is less than 5%.

and Land Use Table 1.3

Yellow and Brown Belts

of India Paper No. 2 of 1952)

[In thousand of acres]

AREA SOWN TO :						
Food crops other than foodgrains and oil seeds	Oil Seeds	Fodder Crops	Cotton	Jute and other fibres (excluding cotton)	Tea, Coffee, Tobacco and other miscellaneous crops	All Crops
7	8	9	10	11	12	13
Belt						
80	271	358	133	97	220	4,412
80	86	417	36	2	15	3,307
160	357	775	169	99	235	7,719
Belt						
1,045	463	2,376	463	26	361	19,434
1,446	1,959	1,069	1,156	42	386	24,418
81	650	397	900	30	39	7,141
2,572	3,072	3,842	2,519	98	786	60,993
37	162	1	25	1	5	744
643	2,567	1,105	279	40	263	19,471
561	4,082	507	3,310	143	73	25,778
1,241	6,811	1,613	3,605	184	341	46,993
126	304	100	279	173	64	3,130
60	121	52	21	122	92	1,443
186	425	152	300	295	156	4,573
3,999	10,308	5,607	6,424	577	1,383	101,559

**Population and
Cultivation and**

Zone/Sub-Region	Statistical category	Land area according to the Surveyor General	Population (1951 Census) IN THOU- SANDS
1	2	3	4
INDIA	ABC	633,032	332,787
	D	179,538	28,501
I—North India	ABC	72,582	63,216
	D	...	...
II—East India	ABC	166,606	88,694
	D	854	1,437
III—South India	ABC	107,526	75,601
	D	...	...
IV—West India	ABC	82,121	36,524
	D	13,629	4,137
V—Central India	ABC	164,930	49,072
	D	20,286	3,197
VI—North-West India	ABC	39,267	19,681
	D	142,711	19,700
<i>Andaman and Nicobar Islands</i>		2,058	30
1.1 Western Himalayan	ABC	25,811	4,613
	D	59,379	4,410
1.2 Eastern Himalayan	ABC	66,530	11,043
	D	854	1,386
2.1 Lower Gangetic Plains	ABC	53,841	70,026
	D	...	50
2.2 Upper Gangetic Plains	ABC	36,570	38,901
	D	...	...
2.3 Trans-Gangetic Plains	ABC	31,141	19,282
	D	19,444	6,585
2.4 The Desert	ABC	...	...
	D	48,198	4,604
3.1 North West Hills	ABC	24,522	6,263
	D	15,690	4,101
3.2 North Central Hills and Plateau	ABC	53,581	13,789
	D	96	18
3.3 North East Plateau	ABC	75,005	25,860
	D	20,190	3,179
3.4 North Deccan	ABC	62,088	23,869
	D	...	...
3.5 South Deccan	ABC	81,735	31,520
	D	...	...
4.1 Gujrat Kathiawar	ABC	32,011	11,965
	D	13,629	4,137
4.2 Malabar-Konkan	ABC	23,882	23,825
	D	...	...
5.1 North Madras and Orissa Coastal	ABC	30,845	21,106
	D	...	...
5.2 South Madras	ABC	35,469	30,726
	D	...	...

Note :—

1. The Scheme of categorisation is explained
2. Figures for "net area sown" given in given in Annexure II to the Introductory
3. Out of the total irrigated area of average of actual figures returned. See

Land-Use Table 1'4
acreage-norms (1951)

[Figures in cols. 3 and 5 to 7 are in thousands of acres]

Net area sown	Area-sown more than once	Net area sown		Area sown more than once		Area irrigated		
		Area irrigated	Per 1000 acres of land area in Sub-Region / Zone	Per 1000 acres in India	Per 1000 acres of Net area Sown in Sub-Region / Zone	Per 1000 acres in India	Per 1000 acres of Gross area Sown in Sub-Region / Zone	Per 1000 acres in India
5	6	7	8	9	10	11	12	13
256,791	34,340	46,834	353	1000	132	1000	155	1000
29,894	3,363	3,457						
39,305	9,579	11,432	542	137	244	254	234	227
...						
51,654	9,866	10,593	314	183	190	264	170	211
846	85	33						
40,358	5,464	11,829	375	141	135	145	258	235
...						
43,095	1,304	2,085	523	175	32	42	48	49
7,006	297	375						
64,815	4,681	3,817	373	241	74	136	53	78
4,249	444	80						
17,564	3,446	7,078	194	123	169	159	243	200
17,793	2,537	2,969						
	Not available							
2,920	971	485	61	18	245	34	197	25
2,258	296	786						
6,481	941	1,345	109	26	140	27	165	27
846	85	33						
35,553	9,935	9,847	660	124	279	264	216	196
...						
23,694	5,725	7,228	648	83	242	152	246	144
...						
18,295	2,899	6,944	488	86	190	124	278	162
6,368	1,785	1,216						
...						
3,109	46	705	65	11	15	1	223	14
8,906	563	283	372	52	65	26	34	11
6,058	410	262						
17,799	1,969	980	332	62	110	52	50	20
28	...	...				
23,049	3,473	3,303	286	95	144	104	108	67
4,221	444	80						
37,553	716	1,603	605	131	19	19	42	32
...						
36,038	990	3,293	441	126	27	26	89	66
...						
13,761	471	471	455	71	37	20	39	17
7,006	297	375						
7,420	815	1,016	311	26	110	22	123	20
...						
11,929	2,633	4,789	387	42	221	70	329	95
...						
13,394	2,240	5,246	378	47	167	59	336	104
...						

in the Introductory Note.

Tables 1'4, 1'5, 1'6, & 1'7, differ from those given in Col. 8 of Table 1'2. A reconciliation of the two figures is

Note. 3,457 thousand acres in category 'D' territories, only 738 thousand is estimated; the remaining 2,719 thousands being Annexure to Table 1'5.

Population and Cultivation

Zone, State and Division	1951 Census Popu- lation of Territories to which Cultivation Statistics relate				Net Area Sown Average—1946-50			Total		
	Population in thousands	Percentage to total popula- tion of the Unit	Statistical	Statistical	Statistical	Total				
			category A	category B	category C					
1	2	3	4	5	6	7				
Population Percentage of territories included in Statistical category :—										
	A	B	C	D*						
INDIA	54.2	28.7	9.2	7.9	332,787	92.1	155,462	59,134	42,195	256,791
I. North India	100.0	...	...	...	63,216	100.0	39,305	...	...	39,305
II. East India	...	97.8	0.7	1.5	88,694	98.5	...	51,267	387	51,654
III. South India	87.4	12.6	...	...	75,601	100.0	37,371	2,987	...	40,358
IV. West India	88.4	...	1.4	10.2	36,524	89.8	42,353	...	742	43,095
V. Central India	34.5	...	59.4	6.1	49,071	93.9	24,386	...	40,429	64,815
VI. North-West India	32.1	15.1	2.8	50.0	19,681	50.0	12,047	4,880	637	17,564
NORTH INDIA										
Uttar Pradesh					63,216	100.0	39,305	...	...	39,305
1.11 Himalayan Uttar Pradesh					2,522	100.0	1,804	...	...	1,804
2.14 East Uttar Pradesh Plain					17,887	100.0	19,426	...	...	19,426
2.21 Central Uttar Pradesh Plain					16,130	100.0	18,866	...	...	18,866
2.22 West Uttar Pradesh Plain					22,771	100.0	14,828	...	...	14,828
3.21 Uttar Pradesh Hills & Plateau					3,906	100.0	4,381	...	...	4,381
EAST INDIA										
Bihar					40,226	100.0	...	22,981	...	22,981
2.12 North Bihar Plain					18,173	100.0	...	9,492	...	9,492
2.13 South Bihar Plain					11,187	100.0	...	6,569	...	6,569
3.31 Chhota Nagpur					10,866	100.0	...	6,920	...	6,920
Orissa					14,646	100.0	...	12,127	...	12,127
3.33 Orissa Inland					7,973	100.0	...	8,213	...	8,213
5.11 Orissa Coastal					6,673	100.0	...	3,913	...	3,913
West Bengal					24,139	97.3	...	10,925	...	10,925
1.25 Himalayan West Bengal					1,360	67.0	...	860	...	860
2.11 West Bengal Plain					22,779	100.0	...	10,065	...	10,065
Assam					9,044	100.0	...	5,234	...	5,234
1.21 Assam Plains					7,806	100.0	...	4,798	...	4,798
1.22 Assam Hills					1,238	100.0	...	436	...	436
Tripura (1.24)					639	100.0	...	...	387	387
SOUTH INDIA										
Madras					57,016	100.0	31,032	...	...	31,032
3.54 Madras Deccan					5,038	100.0	7,421	...	...	7,421
4.23 West Madras					5,819	100.0	2,201	...	...	2,201
5.12 North Madras					14,433	100.0	8,016	...	...	8,016
5.21 South Madras					30,726	100.0	13,394	...	...	13,394
Mysore (3.53)					9,075	100.0	6,339	...	...	6,339
Travancore-Cochin (4.24)					9,280	100.0	...	2,825	...	2,825
Coorg (4.25)					229	100.0	...	162	...	162

*NOTE:—See inset in the Adherente on page 44.

Land Use Table 1.5
per capita (1951)

[Figures in columns 4 to 19 are in thousands of acres]

Area Sown more than once Average—1946-50				Area Irrigated Average—1946-50			Area Irrigated more than once Average—1946-50				Area of culti- vation per capita Average 1946- 50 (in acres)	Component of the area cultivation per capita				
Statistical cate- gory A	Statistical cate- gory B	Statistical cate- gory C	Total	Statistical cate- gory A	Statistical cate- gory B	Statistical cate- gory C	Total	Statistical cate- gory A	Statistical cate- gory B	Statistical cate- gory C		Total	Un- irri- gated single crop	Un- irri- gated double crop	Irrig- ated single crop	Irrig- ated double crop
8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
21,508	10,677	2,155	34,340	30,840	13,606	2,388	46,834	2,960	373	186	3,519	77	54	9	13	1
9,579	...	...	9,579	11,432	...	...	11,432	829	...	...	829	62	30	14	17	1
...	9,796	70	9,866	...	10,593	...	10,593	...	65	...	65	58	35	11	12	...
5,260	214	...	5,464	10,878	951	...	11,829	1,829	185	...	2,014	53	33	4	13	3
1,281	...	23	1,304	2,016	...	69	2,085	250	...	...	250	118	109	3	5	1
3,013	...	1,668	4,681	1,638	...	2,179	3,817	17	...	165	182	132	115	9	8	...
2,385	667	394	3,446	4,876	2,062	140	7,078	35	123	21	179	89	37	16	35	1
9,579	...	...	9,579	11,432	...	...	11,432	829	...	...	829	62	30	14	17	1
300	...	...	300	172	...	...	172	32	...	...	32	72	54	11	6	1
3,020	...	...	3,020	3,428	...	...	3,428	45	...	...	45	53	17	17	19	...
2,293	...	...	2,293	2,573	...	...	2,573	142	...	...	142	55	26	13	15	1
3,432	...	...	3,432	4,655	...	...	4,655	569	...	...	569	65	32	13	18	2
534	...	...	534	604	...	...	604	40	...	...	40	112	84	13	14	1
...	6,555	...	6,555	...	5,469	...	5,469	...	...	...	...	57	27	16	14	...
...	3,091	...	3,091	...	882	...	882	...	...	...	...	52	30	17	5	...
...	2,559	...	2,559	...	3,719	...	3,719	...	...	...	...	59	3	23	33	...
...	905	...	905	...	868	...	868	...	...	...	...	63	47	8	8	...
...	1,105	...	1,105	...	1,961	...	1,961	...	7	...	7	83	62	8	13	...
...	234	...	234	...	1,053	...	1,053	...	5	...	5	103	87	3	13	...
...	871	...	871	...	908	...	908	...	2	...	2	59	32	13	14	...
...	1,331	...	1,331	...	1,988	...	1,988	...	58	...	58	45	32	5	8	...
...	66	...	66	...	170	...	170	...	...	...	...	63	46	5	12	...
...	1,265	...	1,265	...	1,818	...	1,818	...	58	...	58	44	31	5	8	...
...	805	...	805	...	1,175	...	1,175	...	...	...	...	58	36	9	13	...
...	692	...	692	...	1,044	...	1,044	...	...	...	...	60	38	9	13	...
...	113	...	113	...	131	...	131	...	...	...	...	35	15	9	11	...
...	...	70	70	...	...	...	...	...	...	...	...	61	50	11	...	...
4,924	...	...	4,924	9,742	...	...	9,742	1,821	...	...	1,821	54	32	5	14	3
406	...	...	406	615	...	...	615	94	...	...	94	147	129	6	10	2
517	...	...	517	...	...	...	...	...	...	...	...	33	25	8	...	...
1,762	...	...	1,762	3,881	...	...	3,881	355	...	...	355	55	19	10	24	2
2,240	...	...	2,240	5,246	...	...	5,246	1,373	...	...	1,373	44	24	3	13	4
326	...	...	326	1,136	...	...	1,136	7	...	...	7	70	54	4	12	...
...	213	...	213	...	945	...	945	...	185	...	185	30	20	...	8	2
...	1	...	1	...	6	...	6	...	...	...	...	71	68	...	3	...

Population and Cultivation*

Zone, State and Division	1951 Census Population of Territories to which Cultivation Statistics relate		Net Area Sown Average — 1946-50			
	Population in thousands	Percentage to total Population of the unit	Statistical category	Statistical category	Statistical category	Total
			A	B	C	
I	2	3	4	5	6	7
WEST INDIA						
Bombay	35,956	100.0	42,353	...	...	42,353
3.43 Bombay Deccan Northern	12,365	100.0	18,630	...	...	18,630
3.52 Bombay Deccan Southern	4,698	100.0	8,472	...	...	8,472
4.11 Bombay Gujrat	11,397	100.0	13,019	...	...	13,019
4.21 Greater Bombay	2,839	100.0	14	...	...	14
4.22 Bombay Konkan	4,657	100.0	2,218	...	...	2,218
Kutch (4.13)	568	100.0	...	...	742	742
CENTRAL INDIA						
Madhya Pradesh	18,051	85.0	24,386	...	...	24,386
3.24 North West Madhya Pradesh	5,472	99.7	7,805	...	...	7,805
3.32 East Madhya Pradesh	7,021	68.8	7,916	...	...	7,916
3.41 South West Madhya Pradesh	5,558	100.0	8,665	...	...	8,665
Madhya Bharat	7,954	100.0	...	...	10,752	10,752
2.35 Madhya Bharat Lowland	1,692	100.0	...	...	1,846	1,846
3.13 Madhya Bharat Plateau	4,616	100.0	...	...	6,284	6,284
3.14 Madhya Bharat Hills	1,646	100.0	...	...	2,622	2,622
Hyderabad	18,655	100.0	...	...	24,064	24,064
3.42 North Hyderabad	5,946	100.0	...	...	10,258	10,258
3.51 South Hyderabad	12,709	100.0	...	...	13,806	13,806
Vindhya Pradesh (3.22)	3,575	100.0	...	...	4,062	4,062
Bhopal (3.23)	836	100.0	...	...	1,551	1,551
NORTH-WEST INDIA						
Punjab	12,641	100.0	12,047	...	...	12,047
1.13 Himalayan Punjab	982	100.0	479	...	...	479
2.31 Punjab Plains	11,659	100.0	11,568	...	...	11,568
Patiala & East Punjab States Union (2.32)	3,494	100.0	...	4,250	...	4,250
Ajmer (2.36)	693	100.0	...	414	...	414
Delhi (2.33)	1,744	100.0	...	217	...	217
Himachal Pradesh & Bilaspur (1.12)	1,109	100.0	...	...	637	637
SUB-REGIONS						
1.1 Western Himalayan (3 DIVISIONS)	4,613	100.0	2,283	...	637	2,920
1.2 Eastern Himalayan (4 DIVISIONS)	11,043	88.8	...	6,094	387	6,481
2.1 Lower Gangetic Plains (4 DIVISIONS)	70,026	100.0	9,426	26,127	...	35,553
2.2 Upper Gangetic Plains (2 DIVISIONS)	38,901	100.0	23,694	...	...	23,694
2.3 Trans-Gangetic Plains (4 DIVISIONS)	19,282	74.5	11,568	4,881	1,846	18,295
3.1 North West Hills (2 DIVISIONS)	6,262	60.4	...	...	8,906	8,906
3.2 North Central Hills and Plateau (4 DIVISIONS)	13,789	99.9	12,186	...	5,613	17,799
3.3 North East Plateau (3 DIVISIONS)	25,860	89.1	7,916	5,133	...	23,049
3.4 North Deccan (3 DIVISIONS)	23,869	100.0	27,295	...	10,258	37,553
3.5 South Deccan (4 DIVISIONS)	31,520	100.0	22,232	...	13,806	36,038
4.1 Gujrat Kathiawar (2 DIVISIONS)	11,965	74.3	13,019	...	742	13,761
4.2 Malabar-Konkan (5 DIVISIONS)	23,825	100.0	4,433	2,987	...	7,420
5.1 North Madras and Orissa Coastal (2 DIVISIONS)	21,106	100.0	18,016	3,913	...	11,929
5.2 South Madras (1 DIVISION)	30,726	100.0	13,394	...	...	13,394

*NOTE:—Figures for Net Area Sown given in Tables 1.4, 1.5, 1.6 and 1.7 differ from those given in col. 8 of Table 1.2. A reconciliation of

**Annexure to Population and
Estimate* of Cultivation per Capita (1951) in**

D*		1951 Census population of the territories to which Cultivation Statistics relate	Area of Cultivated Land	Area of Land Sown more than once		
Percentage of 1951 India Population of territories for which Cultivation Statistics are unavallable or unsatisfactory.					Population in '000s	Percentage to total Population of unit.	Average 1946-50 (in thousands of acres)	Average 1946-50 (in thousand of acres)
Statistical gaps in	West Bengal & Madhya Pradesh					
	Chandernagore	1.07				
	Manipur	0.01				
	Sikkim	0.16				
	Saurashtra	0.04				
	Rajasthan	1.15				
	Jammu & Kashmir	4.23				
	Andaman and Nicobar Islands	1.22				
	Total	7.88				

I	2	3	4	5
INDIA	28,502	7.9	29,894	3,363
EAST INDIA	1,437	1.5	846	85
Gaps in Statistical Class B Territory of West Bengal	671	2.7	410	15
1.25 Himalayan West Bengal Division (Cooch Behar)	671	33.0	410	15
2.11 West Bengal Plains Division (Chandernagore)	50	100.0	...	...
1.23 Manipur	578	100.0	350	63
1.26 Sikkim	138	100.0	86	7
WEST INDIA	4,137	10.2	7,006	297
4.12 Saurashtra	4,137	100.0	7,006	297
CENTRAL INDIA	3,197	6.1	4,249	444
Gaps in Statistical Class A Territory of Madhya Pradesh	3,197	15.0	4,249	444
3.24 North West Madhya Pradesh Division	18	0.3	28	...
3.32 East Madhya Pradesh Division	3,179	31.2	4,221	444
NORTH-WEST INDIA	19,700	50.0	17,793	2,537
Rajasthan	15,290	100.0	15,535	2,241
2.34 East Rajasthan Plains Division	6,585	100.0	6,368	1,785
2.41 Rajasthan Dry Area Division	4,604	100.0	3,109	46
3.11 Rajasthan Hills Division	2,093	100.0	3,330	284
3.12 Rajasthan Plateau Division	2,008	100.0	2,728	126
1.14 Jammu & Kashmir	4,410	100.0	2,258	296
Andaman & Nicobar Islands	31	100.0	...	...

*NOTE :—The basis for the estimates is explained in Annexure I to the Introductory Note.

Land Use Table 1.5

Statistical Category 'D' territories

<i>Area of Irrigated Land</i>	<i>Area of Land Irrigated more than once</i>	<i>Area of Cultivation Per Capita</i>	<i>Components of the Area of Cultivation Per Capita</i>						
			<i>Un-Irrigated single crop</i>	<i>Un-Irrigated double crop</i>	<i>Irrigated single crop</i>	<i>Irrigated double crop</i>			
<i>Average 1946-50 (in thousands of acres)</i>	<i>Average 1946-50 (in thousands of acres)</i>	<i>Average 1946-50 (In cents)</i>	6	7	8	9	10	11	12
3,457	157	105	81	11	12	1			
33	...	59	51	6	2	...			
16	...	61	57	2	2	...			
16	...	61	57	2	2	...			
...			
...	...	61	50	11	...	...	
17	...	62	45	5	12	...			
375	...	169	153	7	9	...			
375	...	169	153	7	9	...			
80	...	133	116	14	3	...			
80	...	133	116	14	3	...			
...	...	156	156	...	...	...
80	...	133	116	14	3	...			
2,969	157	90	63	12	14	1			
2,183	43	101	73	14	14	...			
1,216	3	97	51	27	19	...			
705	...	67	51	1	15	...			
70	...	159	142	14	3	...			
192	40	136	122	4	8	2			
786	114	51	29	4	15	3			
...			

**Population and
Trend of cultivation per capita**
[FIGURES IN COLUMNS 6 TO

State and Division	Census Population of Territories to which Cultivation Statistics relate				Net area sown				Area sown more than once			
	(IN THOUSANDS)				Quinquennium preceding				Quinquennium preceding			
	1951	1941	1931	1921	1951	1941	1931	1921	1951	1941	1931	1921
I	2	3	4	5	6	7	8	9	10	11	12	13
STATISTICAL CATEGORY												
1. MADRAS	57,016	49,841	44,659	40,393	31,032	31,863	31,996	31,554	4,924	4,779	4,569	4,461
3'54 Madras Deccan	5,038	4,486	4,047	3,669	7,421	7,596	7,645	7,234	406	377	346	304
4'23 West Madras	6,819	5,663	5,076	4,473	2,201	2,164	2,082	1,984	517	490	474	493
5'12 North Madras	14,433	12,726	11,404	9,968	8,016	8,023	8,128	7,784	1,762	1,697	1,654	1,656
5'21 South Madras	30,726	26,966	24,131	22,283	13,394	14,079	14,141	14,553	2,240	2,216	2,096	2,008
2. MYSORE	9,075	7,338	6,566	5,988	6,339	6,729	6,511	6,292	326	274	246	272
3. MADHYA PRADESH	18,051	16,814	15,508	13,913	24,386	24,403	24,936	24,374	3,013	2,875	2,342	2,167
3'14 North West Madhya Pradesh	5,472	5,164	4,718	4,310	7,805	8,108	8,077	7,962	589	502	439	401
3'32 East Madhya Pradesh	7,021	6,466	5,892	5,272	7,916	7,480	7,544	7,268	2,334	2,307	1,863	1,720
3'41 South-West Madhya Pradesh	5,558	5,184	4,898	4,332	8,665	8,815	9,315	9,144	90	65	40	46
4. UTTAR PRADESH	63,216	55,021	48,409	45,376	39,305	36,170	34,749	35,296	9,579	8,585	8,013	8,633
1'11 Himalayan Uttar Pradesh	2,522	1,848	1,625	1,505	1,804	894	881	900	300	192	207	217
2'14 East Uttar Pradesh plain	17,887	15,578	13,920	12,979	9,426	8,962	8,765	8,688	3,020	3,039	2,677	2,770
2'21 Central Uttar Pradesh plain	16,130	14,306	12,531	11,920	8,866	8,566	8,284	8,537	2,293	2,125	1,976	2,224
2'22 West Uttar Pradesh plain	22,771	19,836	17,300	16,183	14,828	13,827	13,290	13,544	3,432	2,813	2,731	2,980
3'21 Uttar Pradesh Hills and Plateau	3,906	3,453	3,033	2,789	4,381	3,921	3,530	3,626	534	417	422	442
5. PUNJAB	12,641	12,701	10,772	9,790	12,046	11,589	11,379	11,391	2,385	2,291	2,002	2,487
1'13 Himalayan Punjab	982	939	838	811	479	493	510	504	277	271	287	270
2'31 Punjab Plains	11,659	11,762	9,934	8,979	11,568	11,097	10,868	10,887	2,108	2,020	1,715	2,217
TOTAL 5 STATES	159,999	141,715	125,914	115,460	113,108	110,754	109,571	108,907	20,227	18,804	17,172	18,020
6. BOMBAY	35,956	20,803	17,879	15,978	42,353	28,546	27,810	26,613	1,281	931	734	788
3'43 Bombay Deccan Northern	12,365	8,197	7,193	6,059	18,630	15,057	14,549	13,690	584	621	426	448
3'52 Bombay Deccan Southern	4,698	3,402	3,049	2,787	8,472	7,029	7,040	6,777	165	75	72	60
4'11 Bombay Gujrat	11,397	4,093	3,148	2,959	13,019	4,402	4,223	4,177	448	158	152	195
4'22 Bombay Konkan	4,657	3,416	3,186	2,879	2,218	2,029	1,961	1,969	84	77	84	85
4'21 Greater Bombay	2,839	1,695	1,303	1,294	14	29	37	...	...	...	...	...
STATISTICAL CATEGORY												
1. TRAVANCORE-COCHIN	9,280	7,500	6,308	4,991	2,825	2,675	2,553	2,454	213	85	119	248
2. COORG	229	169	163	164	162	145	138	142	1	1	1	2
3. ASSAM	9,044	7,592	6,344	5,317	5,234	4,562	4,019	3,477	805	654	427	385
4. AJMER	693	584	507	447	414	307	340	327	47	46	98	60
5. PATIALA & EAST PUNJAB STATES UNION	3,494	3,424	2,912	2,691	4,250	4,229	4,244	4,105	567	626	659	701
6. ORISSA	14,646	13,768	12,491	11,159	12,127	11,805	12,367	12,974	1,105	-738	672	775
7. DELHI	1,744	918	636	488	216	202	208	198	53	52	43	63
TOTAL 7 STATES	39,130	33,956	29,361	25,257	25,228	23,925	23,869	23,677	2,791	2,202	2,019	2,234
8. BIHAR	40,226	36,528	32,556	29,177	22,981	18,914	20,581	21,175	6,555	4,832	5,235	5,661
9. WEST BENGAL	24,139	21,196	17,073	15,808	10,925	7,603	7,406	8,124	1,331	914	747	1,001

Land Use Table 1.6
during three decades— (1921, 50)

21 ARE IN THOUSANDS OF ACRES]

Area Irrigated Quinquennium preceding				Area Irrigated more than once Quinquennium preceding				Area of cultivation Per Capita Quinquennium preceding (In cents)				Components of the Area of Cultivation Per Capita							
												Un-irrigated Single Crop		Un-irrigated Double Crop		Irrigated Single Crop		Irrigated Double Crop	
1951	1941	1931	1921	1951	1941	1931	1921	1951	1941	1931	1921	1951	1921	1951	1921	1951	1921	1951	1921
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
'A' TERRITORIES																			
9,742	8,727	8,393	8,663	1,822	2,055	1,747	1,893	54	64	72	78	32	50	5	6	14	17	3	5
615	564	533	576	94	153	126	187	147	169	189	197	129	178	6	3	10	11	2	5
3,881	3,393	3,200	3,185	355	469	336	400	55	63	71	79	19	34	8	11	...	...	...	...
5,246	4,770	4,660	4,901	1,373	1,433	1,284	1,305	44	52	59	65	24	40	3	3	13	13	28	4
1,136	1,139	1,095	985	7	10	18	29	70	92	99	195	54	85	4	4	12	16	...	...
-1,638	1,214	1,090	776	17	15	14	17	135	145	161	175	109	154	17	15	9	6	...	...
147	137	100	88	13	13	11	14	143	157	171	185	130	174	11	9	2	2	...	...
1,382	992	928	620	3	1	3	2	113	116	128	138	60	93	33	33	20	12	...	...
109	85	362	68	1	1	...	...	156	170	190	211	152	208	2	1	2	2	...	...
11,432	11,298	9,414	11,032	829	936	794	876	62	66	72	78	30	37	14	17	17	22	1	2
172	135	136	150	32	27	37	40	72	48	54	60	54	38	11	12	6	7	1	3
3,428	3,347	2,607	3,180	45	24	13	69	53	58	63	67	17	22	17	21	19	24	...	...
2,573	2,779	2,252	2,926	142	129	141	127	55	60	66	72	26	29	13	18	15	24	1	1
4,655	4,536	4,040	4,417	569	740	591	630	65	70	77	84	32	42	13	15	18	23	2	4
604	501	378	359	40	16	11	10	112	114	116	130	84	102	13	15	14	13	1	...
4,876	4,899	4,219	3,503	35	82	75	67	95	91	106	116	38	55	19	25	38	35	...	1
173	176	176	178	...	...	...	...	49	53	61	62	3	7	28	33	18	22	...	...
4,702	4,722	4,043	3,325	35	82	75	67	99	94	109	121	41	60	18	24	40	36	...	1
28,824	27,277	24,210	24,959	2,709	3,098	2,648	2,882	71	78	87	94	42	60	11	13	16	19	2	2
2,016	1,125	1,013	995	250	178	126	133	118	137	156	166	109	156	3	4	5	5	1	1
1,233	761	647	634	210	158	111	116	151	184	202	226	138	210	3	5	8	9	2	3
315	193	187	157	15	10	10	9	180	207	231	243	171	236	3	2	6	5	...	...
402	117	119	138	18	5	2	7	114	108	124	141	107	130	4	6	3	5	...	...
60	53	60	66	7	5	3	1	48	59	62	68	45	63	2	3	1	2	...	...
5	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
'B' TERRITORIES																			
945	1,112	1,249	1,330	185	53	62	216	30	36	40	49	20	22	...	1	8	22	2	4
26	4	4	4	...	...	...	...	71	86	85	86	68	83	...	1	3	2	...	...
1,175	466	356	272	...	...	...	...	58	60	63	65	36	53	9	7	13	5	...	...
104	111	127	100	25	16	13	10	60	53	67	73	41	40	3	11	12	20	4	2
1,902	1,756	1,550	1,238	98	95	105	96	122	124	146	153	54	84	13	22	52	43	3	4
1,961	1,669	1,738	1,652	7	115	1	78	83	86	99	116	62	95	8	6	13	14	...	1
56	66	60	49	...	...	...	...	12	22	33	41	6	18	3	13	3	10	...	...
6,149	5,184	5,084	4,645	315	279	181	400	95	70	81	94	43	68	6	7	15	17	1	2
5,469	4,712	4,667	4,105	...	...	...	...	57	52	63	73	27	39	16	20	14	14	...	...
1,988	1,728	1,207	1,722	58	29	106	112	45	36	43	51	32	34	5	6	8	10	...	1

**Population and
Trend of Cultivation and Irrigation per capita**

Year	Area under food-grains	Area under crops other than food- grains	Gross area sown	Area sown more than once	Net area sown
1	2	3	4	5	6
INDIA (8 WHOLE DIVISIONS AND PARTS OF 5 DIVISIONS)					
1891	79,786	19,083	98,869	9,904	88,965
1901	75,718	17,728	93,446	9,440	84,006
1911	80,335	20,969	101,304	9,768	91,536
1921	80,756	22,804	103,560	10,904	92,656
1931	N.A.	N.A.	104,679	10,401	94,278
1941	N.A.	N.A.	107,235	11,414	95,821
1951	86,440	25,142	111,582	12,489	99,093
NORTH INDIA (FOUR DIVISIONS OF U. P. NOS. 2·14, 2·21, 3·21 & 2·22; TWO WHOLE DIVISIONS NOS. 2·14 &					
1891	35,042	5,764	40,806	7,866	32,940
1901	33,370	5,022	38,392	7,115	31,277
1911	35,321	5,354	40,675	7,404	33,271
1921	36,550	5,386	41,936	8,256	33,680
1931	N.A.	N.A.	40,855	7,659	33,196
1941	N.A.	N.A.	42,786	8,219	34,567
1951	39,230	5,905	45,135	8,947	36,188
SOUTH INDIA (THREE DIVISIONS OF MADRAS NOS. 3·54, 4·23 & 5·21 and MYSORE No. 3·53, THREE WHOLE					
1891	16,034	3,822	19,856	1,302	18,554
1901	16,969	3,849	20,818	1,618	19,200
1911	17,421	4,570	21,991	1,637	20,354
1921	16,590	5,234	21,824	1,655	20,169
1931	N.A.	N.A.	22,597	1,720	20,877
1941	N.A.	N.A.	22,873	1,890	20,983
1951	15,842	6,660	22,502	2,105	20,397
WEST INDIA (THREE DIVISIONS OF BOMBAY NOS. 3·52, 4·22 & 3·43; ONE WHOLE DIVISION No. 3·52 AND TWO					
1891	17,443	4,203	21,646	444	21,202
1901	15,595	3,553	19,148	475	18,673
1911	16,241	4,661	20,902	451	20,451
1921	16,173	6,074	22,247	546	21,701
1931	N.A.	N.A.	23,356	543	22,813
1941	N.A.	N.A.	24,086	738	23,348
1951	19,396	7,400	26,796	758	26,038
CENTRAL INDIA (TWO WHOLE DIVISIONS OF MADHYA PRADESH NOS. 3·24 & 3·41)					
1891	11,267	5,294	16,561	292	16,269
1901	9,784	5,304	15,088	232	14,856
1911	11,352	6,384	17,736	276	17,460
1921	11,443	6,110	17,553	447	17,106
1931	N.A.	N.A.	17,871	479	17,392
1941	N.A.	N.A.	17,490	567	16,923
1951	11,972	5,177	17,149	679	16,470

Land Use Table 1.7
during six decades (1891-1950) — India and Zones

[FIGURES IN COLUMNS 2 TO 7 ARE IN THOUSANDS OF ACRES]

Area irrigated	Census population (in '000's)	Area per capita (in cents)				Foodgrain cultivation percentage $\left[100 \times \frac{\text{Col. 2}}{\text{Col. 4}} \right]$
		Net area sown	Area under foodgrains	Gross area sown	Area Irrigated	
7	8	9	10	11	12	13
12,772	81,481	109	98	121	16	80.7
14,156	81,832	103	93	114	17	81.0
14,167	84,223	109	95	120	17	79.3
15,185	83,336	111	97	124	18	78.0
13,780	90,697	104	N.A.	115	15	N.A.
15,931	101,732	94	N.A.	105	16	N.A.
16,776	117,881	84	73	95	14	77.5
2.21 AND TWO PART DIVISIONS NOS. 3.21 & 2.22)						
8,569	44,368	74	79	92	19	85.9
9,806	45,196	69	74	85	22	86.9
9,951	44,334	75	80	92	22	86.8
10,758	43,147	78	85	97	25	87.2
9,161	45,996	72	N.A.	89	20	N.A.
11,029	52,273	66	N.A.	82	21	N.A.
11,065	59,133	61	66	76	19	86.9
DIVISIONS NOS. 3.54, 4.23 & 3.53 AND ONE PART DIVISION NO. 5.21)						
3,370	18,246	102	88	109	18	80.8
3,388	18,889	102	90	110	18	81.5
3,408	20,177	101	86	109	17	79.2
3,452	20,976	96	79	104	16	76.0
3,591	22,954	91	N.A.	98	16	N.A.
3,691	25,469	82	N.A.	90	14	N.A.
3,974	29,985	68	53	75	13	70.4
PART DIVISIONS NOS. 4.22 & 3.43)						
688	10,554	201	165	205	7	80.6
806	9,985	187	156	192	8	81.4
648	10,874	188	149	192	6	77.7
819	10,571	205	153	210	8	72.7
866	12,131	188	N.A.	193	7	N.A.
989	13,642	171	N.A.	177	7	N.A.
1,481	17,733	147	109	151	8	72.4
145	8,313	196	136	199	2	68.0
156	7,762	191	126	194	2	64.8
160	8,838	198	128	201	2	64.0
156	8,642	198	132	203	2	65.2
162	9,616	181	N.A.	186	2	N.A.
222	10,348	164	N.A.	169	2	N.A.
256	11,030	49	109	155	2	69.8

**Population and
Trend of Cultivation and Irrigation per capita**

Year	Area under foodgrains	Area under crops other than foodgrains	Gross area sown	Area sown more than once	Net area sown
1	2	3	4	5	6
2·14—East U. P. Plain Division (WHOLE)					
1891	9,708	1,298	11,006	2,582	8,424
1901	9,346	1,001	10,347	2,330	8,017
1911	10,098	960	11,058	2,516	8,542
1921	10,515	943	11,458	2,770	8,688
1931	N.A.	N.A.	11,442	2,677	8,765
1941	N.A.	N.A.	12,001	3,039	8,962
1951	11,240	1,206	12,446	3,020	9,426
2·21—Central U. P. Plain Division (WHOLE)					
1891	9,610	1,021	10,631	2,293	8,338
1901	9,062	867	9,929	2,043	7,886
1911	9,537	922	10,459	2,184	8,275
1921	9,854	907	10,761	2,224	8,537
1931	N.A.	N.A.	10,260	1,976	8,284
1941	N.A.	N.A.	10,691	2,125	8,566
1951	10,067	1,092	11,159	2,293	8,866
2·22—West U. P. Plain Division—(PART)					
1891	13,270	2,846	16,116	2,793	13,323
1901	12,837	2,739	15,576	2,580	12,996
1911	13,324	2,988	16,312	2,537	13,775
1921	13,431	3,093	16,524	2,980	13,544
1931	N.A.	N.A.	16,021	2,731	13,290
1941	N.A.	N.A.	16,640	2,813	13,827
1951	14,519	3,317	17,836	3,343	14,493
3·21—U.P. Hills and Plateau Division (PART)					
1891	2,454	599	3,053	198	2,855
1901	2,125	415	2,540	162	2,378
1911	2,362	484	2,846	167	2,679
1921	2,750	443	3,193	282	2,911
1931	N.A.	N.A.	3,132	275	2,857
1941	N.A.	N.A.	3,454	242	3,212
1951	3,404	290	3,694	291	3,403
3·53—Mysore (WHOLE)					
1891	4,801	824	5,625	128	5,497
1901	5,301	1,003	6,304	236	6,068
1911	5,180	933	6,113	168	5,945
1921	5,413	1,151	6,564	272	6,292
1931	N.A.	N.A.	6,757	246	6,511
1941	N.A.	N.A.	7,003	274	6,729
1951	5,075	1,590	6,665	326	6,339

Land Use Table 1 8
during six decades (1891-1950)—Selected Divisions

Area irrigated	Census population (in 000's)	Area per capita (in cents)				Foodgrain cultivation percentage [$100 \times \frac{\text{Col. 2}}{\text{Col. 4}}$]
		Net area sown.	Area under foodgrains	Gross area sown	Area irrigated	
7	8	9	10	11	12	13
.2,762	13,163	64	74	84	21	88.2
2,839	12,763	63	73	81	22	90.3
2,861	12,500	68	81	88	23	91.3
3,180	12,979	67	81	88	25	91.8
2,607	13,920	63	N.A.	82	19	N.A.
3,347	15,578	58	N.A.	77	21	N.A.
3,428	17,887	53	63	70	19	90.3
2,567	12,747	65	75	83	20	90.4
2,829	12,908	61	70	77	22	91.3
2,829	12,424	67	77	84	23	91.2
2,926	11,920	72	83	90	25	91.6
2,252	12,531	66	N.A.	82	18	N.A.
2,779	14,306	60	N.A.	75	19	N.A.
2,573	16,130	55	62	69	16	90.2
3,136	16,158	82	82	100	19	82.3
4,006	17,419	75	74	89	23	82.4
4,069	17,203	80	77	95	24	81.7
4,417	16,183	84	83	102	27	81.3
4,040	17,300	77	N.A.	93	23	N.A.
4,536	19,836	70	N.A.	84	23	N.A.
4,631	22,228	65	65	80	21	81.4
104	2,300	124	107	133	5	80.4
132	2,106	113	101	121	6	83.7
192	2,207	121	107	129	9	83.0
235	2,065	141	133	155	11	86.1
262	2,245	127	N.A.	140	12	N.A.
367	2,553	126	N.A.	135	14	N.A.
433	2,888	118	118	128	15	92.1
893	4,598	120	104	122	19	85.4
946	5,151	118	103	122	18	84.1
911	5,400	110	96	113	17	84.7
985	5,988	105	90	110	16	82.5
1,095	6,566	99	N.A.	103	17	N.A.
1,139	7,338	92	N.A.	95	16	N.A.
1,136	9,075	70	56	73	13	76.1

**Population and
Trend of Cultivation and Irrigation per**

Year	Area under foodgrains	Area under crops other than foodgrains	Gross area sown	Area sown more than once	Net area sown
1	2	3	4	5	6
3·54—Madras Deccan Division (WHOLE)					
1891	5,401	1,630	7,031	239	6,792
1901	5,635	1,486	7,121	345	6,776
1911	6,121	1,691	7,812	335	7,477
1921	5,471	2,067	7,538	304	7,234
1931	N.A.	N.A.	7,991	346	7,645
1941	N.A.	N.A.	7,973	377	7,596
1951	5,197	2,630	7,827	406	7,421
4·23—West Madras Division—(WHOLE)					
1891	1,229	492	1,721	356	1,365
1901	1,317	519	1,836	413	1,423
1911	1,507	739	2,246	463	1,783
1921	1,604	873	2,477	493	1,984
1931	N.A.	N.A.	2,556	474	2,082
1941	N.A.	N.A.	2,654	490	2,164
1951	1,619	1,099	2,718	517	2,201
5·21—South Madras Division (PART)					
1891	4,603	876	5,479	579	4,900
1901	4,716	841	5,557	624	4,933
1911	4,613	1,207	5,820	671	5,149
1921	4,102	1,143	5,245	586	4,659
1931	N.A.	N.A.	5,293	654	4,639
1941	N.A.	N.A.	5,243	749	4,494
1951	3,951	1,341	5,292	856	4,436
3·43—Bombay Deccan Northern Division (PART)					
1891	11,335	2,634	13,969	338	13,631
1901	9,955	2,280	12,235	365	11,870
1911	10,505	2,799	13,304	329	12,975
1921	10,507	3,631	14,138	448	13,690
1931	N.A.	N.A.	14,975	426	14,549
1941	N.A.	N.A.	15,678	621	15,057
1951	12,213	4,416	16,629	537	16,092
3·52—Bombay Deccan Southern Division (WHOLE)					
1891	5,064	1,485	6,549	76	6,473
1901	4,641	1,198	5,839	88	5,751
1911	4,744	1,780	6,524	78	6,446
1921	4,700	2,137	6,837	60	6,777
1931	N.A.	N.A.	7,112	72	7,040
1941	N.A.	N.A.	7,104	75	7,029
1951	6,080	2,557	8,637	165	8,472

Land Use Table 1·8—contd.

Capita during six decades (1891-1950)—Selected Divisions

Area irrigated	Census population (in 000's)	Area per Capita (in cents)				Foodgrains cultivation percentage [100 × $\frac{\text{Col. 2}}{\text{Col. 4}}$]
		Net Area sown	Area under foodgrains	Gross area sown	Area irrigated	
7	8	9	10	11	12	13
616	3,699	184	146	190	17	76·8
586	3,633	187	155	196	16	79·1
577	3,761	199	163	208	15	78·4
576	3,669	197	149	205	16	72·6
533	4,047	189	N.A.	197	13	N.A.
564	4,486	169	N.A.	178	13	N.A.
615	5,038	147	103	155	12	66·4
39	3,809	36	32	45	1	71·4
39	4,044	35	33	45	1	71·7
...	4,329	41	35	52	...	67·1
...	4,473	44	36	55	...	64·8
...	5,076	41	N.A.	50	...	N.A.
...	5,663	38	N.A.	47	...	N.A.
...	6,819	32	24	40	...	59·6
1,822	6,140	80	75	89	30	84·0
1,817	6,061	81	78	92	30	84·9
1,920	6,687	77	69	87	29	79·3
1,891	6,846	68	60	77	28	78·2
1,963	7,265	64	N.A.	73	27	N.A.
1,988	7,982	56	N.A.	66	25	N.A.
2,223	9,053	49	44	58	25	74·7
513	5,926	230	191	236	9	81·1
634	5,364	221	186	228	12	81·4
493	6,235	208	168	213	8	79·0
634	6,059	226	173	233	10	74·3
647	7,193	202	N.A.	208	9	N.A.
761	8,197	184	N.A.	191	9	N.A.
1,119	10,090	159	121	165	11	73·4
142	2,861	126	177	229	5	77·3
144	2,843	102	163	205	5	79·5
131	2,833	128	167	230	5	72·7
157	2,787	143	169	245	6	68·7
187	3,049	231	N.A.	233	6	N.A.
193	3,402	207	N.A.	209	6	N.A.
315	4,698	180	129	184	7	70·4

**Population and
Trend of Cultivation and Irrigation per**

Year	<i>Area under foodgrains</i>	<i>Area under crops other than foodgrains</i>	<i>Gross area sown</i>	<i>Area sown more than once</i>	<i>Net area sown</i>
1	2	3	4	5	6
4*22—Bombay Konkan Division (PART)					
1891	1,044	84	1,128	30	1,098
1901	999	75	1,074	22	1,052
1911	992	82	1,074	44	1,030
1921	966	306	1,272	38	1,234
1931	N.A.	N.A.	1,269	45	1,224
1941	N.A.	N.A.	1,304	42	1,262
1951	1,103	427	1,530	56	1,474
3*24—North West Madhya Pradesh Division (WHOLE)					
1891	6,105	1,508	7,613	269	7,344
1901	4,618	2,115	6,733	206	6,527
1911	6,024	1,921	7,945	248	7,697
1921	6,505	1,858	8,363	401	7,962
1931	N.A.	N.A.	8,516	439	8,077
1941	N.A.	N.A.	8,610	502	8,108
1951	6,856	1,538	8,394	589	7,805
3*41—South West Madhya Pradesh Division (WHOLE)					
1891	5,162	3,786	8,948	23	8,925
1901	5,166	3,189	8,355	26	8,329
1911	5,328	4,463	9,791	28	9,763
1921	4,938	4,252	9,190	46	9,144
1931	N.A.	N.A.	9,355	40	9,315
1941	N.A.	N.A.	8,880	65	8,815
1951	5,116	3,639	8,755	90	8,665

NOTE.—Area figures for all divisions are averages of the quinquennium 1890-91 to 1894-95 for 1891; averages of the Superintendents' figures for part divisions.

Land Use Table 1.8—concl'd.

Capita during six decades (1891-1950)—Selected Divisions

<i>Area per capita (in cents)</i>						
<i>Area irrigated</i>	<i>Census population (in 000's)</i>	<i>Net Area sown</i>	<i>Area under foodgrains</i>	<i>Gross area sown</i>	<i>Area irrigated</i>	<i>Foodgrains cultivation percentage</i> [$100 \times \frac{\text{Col. 3}}{\text{Col. 4}}$]
7	8	9	10	11	12	13
33	1,767	62	59	64	2	92.6
28	1,778	59	56	60	2	93.0
24	1,806	57	55	59	1	92.4
28	1,725	72	56	74	2	75.9
32	1,889	65	N.A.	67	2	N.A.
35	2,043	62	N.A.	64	2	N.A.
47	2,945	50	37	52	2	72.1
75	4,257	173	143	179	2	80.2
65	3,871	169	119	174	2	68.6
85	4,506	171	134	176	2	75.8
88	4,310	185	151	194	2	77.8
100	4,718	171	N.A.	181	2	N.A.
137	5,164	157	N.A.	167	3	N.A.
147	5,472	143	125	153	3	81.7
70	4,056	220	127	221	2	57.7
91	3,891	214	133	215	2	61.8
75	4,332	225	123	226	2	54.4
68	4,332	211	114	212	2	53.7
62	4,898	190	N.A.	191	1	N.A.
85	5,184	170	N.A.	171	2	N.A.
109	5,558	156	92	158	2	58.4

preceding quinquennium for 1901 and 1911; and for 1921-51 same as given in table 1.6 for whole divisions and State Census

Population and Land Use Table 1'9
Mineral Production of India by Sub-Regions

Percentage to total India			Percentage to total India		
Mineral produced	Pro-duction	Value (in 000 Rupees)	Mineral produced	Pro-duction	Value (in 000 Rupees)
1	2	3	1	2	3
I—NORTH EAST PLATEAU SUB-REGION (3·3)			3·53 Mysore Division		
TOTAL VALUE OF ALL MINERALS		<u>487,322·4</u>	Iron	1·79	189·4
3·31 Chhota Nagpur Division			Manganese	0·29	94·1
Coal	82·25	359035·2	Gold	98·40	48663·7
Iron Ore	46·15	4883·6	Mica	0·53	565·2
Manganese	4·52	1467·5	Magnasite	3·82	35·2
Mica	56·45	60196·0	Kyanite	3·65	43·5
Copper	100·00	8865·0	Chromite	38·41	275·8
Kyanite	95·83	1139·4	Graphite	14·64	24·7
Chromite	12·60	90·5	TOTAL VALUE OF ALL MINERALS		<u>49,891·6</u>
Bauxite	44·33	159·1	3·54 Madras Deccan Division		
TOTAL VALUE OF ALL MINERALS		<u>435,836·3</u>	Manganese	9·87	3204·5
3·32 East Madhya Pradesh Division			TOTAL VALUE OF ALL MINERALS		<u>3,204·5</u>
Coal	4·41	19250·4	III—NORTH CENTRAL HILLS & PLATEAU SUB-REGION (3·2)		
Iron Ore	0·02	2·1	TOTAL VALUE OF ALL MINERALS		<u>30,604·9</u>
Manganese	46·37	15054·9	3·22 Vindhya Pradesh Division		
TOTAL VALUE OF ALL MINERALS		<u>34,307·4</u>	Coal	2·12	9254·2
3·33 Orissa Inland Division			Gypsum	0·17	0·1
Coal	1·36	5936·6	Bauxite	0·79	2·9
Manganese	16·47	5347·3	TOTAL VALUE OF ALL MINERALS		<u>9,257·2</u>
Iron Ore	51·94	5496·3	3·24 North West Madhya Pradesh Division		
Kyanite	0·37	4·4	Coal	4·76	20778·2
Chromite	39·42	283·0	Manganese	1·15	373·4
Graphite	65·47	111·1	Bauxite	45·38	162·9
TOTAL VALUE OF ALL MINERALS		<u>17,178·7</u>	Graphite	19·61	33·2
II—SOUTH DECCAN SUB-REGION (3·5)			TOTAL VALUE OF ALL MINERALS		<u>21,347·7</u>
TOTAL VALUE OF ALL MINERALS		<u>69,795·9</u>	IV—EASTERN HIMALAYAN SUB-REGION (1·2)		
3·51 South Hyderabad Division			TOTAL VALUE OF ALL MINERALS		<u>19,883·2</u>
Coal	3·64	15889·3	1·21 Assam Plains		
Gold	1·60	791·3	Coal	0·90	3928·6
TOTAL VALUE OF ALL MINERALS		<u>16,680·6</u>	Petroleum	100·00	14645·0
3·52 Bombay Deccan Southern Division			TOTAL VALUE OF ALL MINERALS		<u>18,573·6</u>
Bauxite	5·34	19·2	1·22 Assam Hills		
TOTAL VALUE OF ALL MINERALS		<u>19·2</u>	Coal	0·3	1309·6
TOTAL VALUE OF ALL MINERALS		<u>19·2</u>	TOTAL VALUE OF ALL MINERALS		<u>1,309·6</u>

Population and Land Use Table 1'9—concl'd.

Mineral Production of India by Sub-Regions

	1	2	3		1	2	3
V—NORTH WEST HILLS SUB-REGION (3·1)				X—NORTH DECCAN SUB-REGION (3·4)			
	TOTAL VALUE OF ALL MINERALS		18,837·7		TOTAL VALUE OF ALL MINERALS		4,972·5
3·11 Rajasthan Hills Division				3·41 South West Madhya Pradesh Division			
Manganese	0·53		172·1	Coal	0·08		349·2
Lead	100·00		831·0	Manganese	14·24		4623·3
	TOTAL VALUE OF ALL MINERALS		1,003·1		TOTAL VALUE OF ALL MINERALS		4,972·5
3·12 Rajasthan Plateau Division				XI—MALABAR KONKAN SUB-REGION (4·2)			
Mica	16·67		17776·2		TOTAL VALUE OF ALL MINERALS		3,803·1
	TOTAL VALUE OF ALL MINERALS		17,776·2	4·22 Bombay Konkan Division			
3·14 Madhya Bharat Hills Division				Iron	0·1		10·6
Manganese	0·18		58·4	Manganese	0·06		19·5
	TOTAL VALUE OF ALL MINERALS		58·4	Mica	0·16		170·6
VI—NORTH MADRAS & ORISSA COASTAL SUB-REGION (5·1)				Bauxite	0·02		0·1
	TOTAL VALUE OF ALL MINERALS		13,553·2		TOTAL VALUE OF ALL MINERALS		200·8
5·12 North Madras Division				4·24 Travancore-Cochin Division			
Manganese	2·41		782·5	Mica	0·35		373·3
Mica	11·91		12700·3	Ilminite	100·00		3229·0
Kyanite	0·15		1·7		TOTAL VALUE OF ALL MINERALS		3,602·3
Chromite	9·6		68·7	XII—THE DESERT SUB-REGION (2·4)			
	TOTAL VALUE OF ALL MINERALS		13,553·2		TOTAL VALUE OF ALL MINERALS		1,351·6
VII—SOUTH MADRAS SUB-REGION (5·2)				2·41 Rajasthan Dry Area			
	TOTAL VALUE OF ALL MINERALS		1,091·2	Coal	0·18		785·7
5·21 South Madras Division				Gypsum	70·74		565·9
Magnesite	96·18		884·8		TOTAL VALUE OF ALL MINERALS		1,351·6
Gypsum	24·71		197·7	XIII—GUJRAT KATHIAWAR SUB-REGION (4·1)			
Bauxite	2·43		8·7		TOTAL VALUE OF ALL MINERALS		1,311·9
	TOTAL VALUE OF ALL MINERALS		1,091·2	4·11 Bombay Gujrat Division			
VIII—LOWER GANGETIC PLAINS SUB-REGION (2·1)				Manganese	3·91		1269·5
	TOTAL VALUE OF ALL MINERALS		10,162·4	Bauxite	1·71		6·1
2·13 South Bihar Plain Division					TOTAL VALUE OF ALL MINERALS		1,275·6
Mica	9·53		10162·4	4·12 Saurashtra Division			
	TOTAL VALUE OF ALL MINERALS		10,162·4	Gypsum	4·44		35·5
IX—TRANS-GANGETIC PLAINS SUB-REGION (2·3)					TOTAL VALUE OF ALL MINERALS		35·5
	TOTAL VALUE OF ALL MINERALS		4692·0	4·13 Kutch Division			
2·36 Ajmer Division				Gypsum	0·1		0·8
Mica	4·40		4692·0		TOTAL VALUE OF ALL MINERALS		0·8
	TOTAL VALUE OF ALL MINERALS		4,692·0				

Annexure I to Population and Land Use Table 1.9

Percentage distribution of (the quantity of) minerals produced by natural divisions

	Percentage		Percentage
<i>Coal</i>	100.00	<i>Manganese Ore</i>	100.00
1. Chhota Nagpur	82.25	1. East Madhya Pradesh	46.37
2. North-West Madhya Pradesh	4.76	2. Orissa Inland	16.47
3. East Madhya Pradesh	4.41	3. South-West Madhya Pradesh	14.24
4. South Hyderabad	3.64	4. Madras Deccan	9.87
5. Vindhya Pradesh	2.12	5. Chhota Nagpur	4.52
6. Orissa Inland	1.36	6. Bombay Gujrat	3.91
7. Assam Plains	0.90	7. North Madras	2.41
		8. North-West Madhya Pradesh	1.15
<i>Others</i> (Assam Hills, Rajasthan Dry Area, and South-west Madhya Pradesh divisions)	0.56	9. Rajasthan Hills	0.53
		10. Madhya Bharat Hills	0.18
		<i>Others</i> (Mysore and Bombay-Konkan divisions)	0.35
<i>Mica</i>	100.00	<i>Petroleum</i>	100.00
1. Chhota Nagpur	56.45	1. Assam Plains Division	100.00
2. Rajasthan Plateau	16.67		
3. North Madras	11.91	<i>Iron ore</i>	100.00
4. South Bihar Plain	9.53	1. Orissa Inland	51.94
<i>Others</i> (Ajmer, Mysore, Bombay- Konkan, and Travancore-Cochin divisions)	5.44	2. Chhota Nagpur	46.15
		3. Mysore	1.79
		<i>Others</i> (East Madhya Pradesh and Bombay-Konkan divisions)	0.12
<i>Gold</i>	100.00	<i>Copper Ore</i>	100.00
1. Mysore Division	98.40	1. Chhota Nagpur	100.00
2. South Hyderabad Division	1.60		

Annexure II to Population and Land Use Table 19

Mineral Production of India (Arranged by Value of Production)—(Five Year Average 1946-50).

Name of Mineral	Value in 000's of rupees of annual pro- duction	Percentage of total value of all minerals
1	2	3
I. Coal	436,517	58.86
II. (1) Mica	106,636	14.38
(2) Gold	49,455	6.67
(3) Manganese Ore	32,467	4.38
(4) Petroleum	14,645	1.97
(5) Iron Ore	10,582	1.43
(6) Copper Ore	8,865	1.20
(7) <i>Other classified minerals</i> :	8,215	1.11
(a) Ilmenite	3,229	0.44
(b) Kyanite	1,189	0.16
(c) Magnesite	920	0.12
(d) Lead	831	0.11
(e) Gypsum	800	0.11
(f) Chromite	718	0.10
(g) Bauxite	359	0.05
(h) Graphite	169	0.02
III. <i>Others</i> *	74,199	10.00
GRAND TOTAL	741,581	100.00

*Others' include :

Metals : Silver (55).

Non-Metals : Salt (34368), Building materials (32388), Salt petre (2485), China Clay (1379), Steatite (908), Fire Clay (719), Other clays (692), Barytes (318), Diamond (292), Ochre (191), Emerald (139), Asbestos (69), Fullers earth (66), Corundum (57), Felspar (14), Apatite (14), Others i. e. Zinc, Sillimanite, Wolfram, Pyrite, Rutile and Vermiculite (45).

The figures in brackets indicate the annual value of production in thousands of rupees—five year average, 1946-50.

Table 2.0—Yield per acre *of Foodgrains in India [Figures supplied by the Directorate of Economics and Statistics, Ministry of Food & Agriculture]

(Average for the quinquennium 1947-48 to 1951-52)

							(IN LBS.)
Zone	(Clean) Rice	Jowar	Bajra	Wheat	All cereals	Cereals and gram	
1	2	3	4	5	6	7	
North India	533	497	467	700	606	598	
East India	658	437	567	489	630	623	
South India	890	482	461	241	675	674	
West India	717	266	215	378	335	332	
Central India	546	328	193	372	385	383	
North-West India	592	192	174	701	406	413	
INDIA (Excluding Jammu & Kashmir)	666	330	258	576	514	508	

*The yields per acre given in this statement have been obtained by dividing the official estimates of production by the corresponding acreage.

Population and Land Use Table 2·1
Yield Rates of principal crops in India used by Dr. V.G. Panse in his special study
RICE

Year	Uttar Pradesh			Madhya Pradesh			Bombay			Madras		
	Area in '000 acres	Irrigation percentage	Average yield in lbs./acre—actual	Area in '000 acres	Irrigation percentage	Average yield in lbs./acre—actual	Area in '000 acres	Irrigation percentage	Average yield in lbs./acre—actual	Area in '000 acres	Irrigation percentage	Average yield in lbs./acre—actual
1	2	3	4	5	6	7	8	9	10	11	12	13
1910—11	...	...	...	4730	11·0	997	...	...	...	...	...	...
1911—12	5241	...	760	4822	9·2	1016	...	...	...	10289	...	846
1912—13	6779	...	660	4999	16·4	528	...	...	...	10944	...	908
1913—14	6140	...	461	4986	17·0	358	...	...	...	10678	...	878
1914—15	6166	...	740	4919	12·4	607	...	...	...	10876	...	875
1915—16	6398	...	805	5052	7·7	727	...	...	...	11230	...	908
1916—17	7105	...	847	5142	7·9	640	...	...	...	11655	...	1170
1917—18	7384	...	811	5171	7·0	673	...	...	...	10469	...	1059
1918—19	6697	...	479	5306	21·8	319	1709	N.A.	513	11646	...	899
1919—20	6540	6·5	771	5072	16·8	742	1931	8·5	1144	11096	73·6	1033
1920—21	6809	8·9	509	5126	19·8	310	1006	8·4	863	11280	70·5	1007
1921—22	6814	5·1	758	5071	18·7	709	1956	8·5	1058	11286	71·2	1039
1922—23	6983	4·4	675	5144	17·9	641	1886	7·2	1057	10518	70·9	1039
1923—24	6981	5·0	629	5171	18·3	656	1811	6·4	932	10870	70·0	965
1924—25	7072	4·1	721	5171	17·1	509	1887	8·7	1016	11323	69·6	1011
1925—26	7417	5·1	652	5198	21·3	622	1960	9·7	935	10842	71·2	1053
1926—27	7437	5·4	705	5280	16·0	699	1971	9·1	1071	10930	68·8	980
1927—28	7266	6·8	673	5411	17·9	647	2013	8·9	1047	11019	69·9	1042
1928—29	7024	10·7	352	5445	17·3	603	1953	9·6	1076	11262	70·3	1056
1929—30	6815	11·8	501	5480	16·4	730	1928	9·2	946	11678	71·3	1045
1930—31	6722	10·4	568	5541	17·6	568	1991	9·9	978	11538	72·6	1031
1931—32	6554	6·8	680	5528	14·7	718	1976	11·2	1024	11534	71·6	1045
1932—33	6140	9·6	484	5595	18·6	677	2027	10·9	1002	11704	71·1	1050
1933—34	5980	9·3	650	5638	16·7	659	2022	11·0	999	11056	71·7	1017
1934—35	6437	8·5	674	5631	15·3	704	2048	11·0	1043	9796	71·9	1009
1935—36	6626	9·1	659	5589	20·0	588	1972	8·5	958	9890	77·0	1084
1936—37	6641	5·9	693	5683	15·6	702	1831	7·5	857	10141	77·5	1086
1937—38	7032	8·0	645	5764	18·6	609	2037	10·2	975	2844	78·2	1071
1938—39	7663	7·0	585	5794	14·7	744	2015	8·5	877	9884	76·2	933
1939—40	7634	7·4	692	5896	19·6	552	1860	11·0	805	10744	77·9	1012
1940—41	7162	9·1	544	5873	27·0	420	1970	8·3	912	10212	78·6	1074
1941—42	6423	9·5	525	5757	22·6	347	1915	10·8	743	10382	78·2	1087
1942—43	6902	7·9	575	5654	24·5	725	2113	10·9	989	10925	77·7	996
1943—44	6977	9·0	580	5875	22·1	697	2005	11·5	985	11014	79·6	1011
1944—45	7034	9·9	469	6021	21·5	642	2063	12·8	896	10203	79·8	1028
1945—46	6914	9·7	573	6071	22·7	605	2093	11·2	879	10986	79·2	931

Population and Land Use Table 2.2

Yield Rates of principal crops in India used by Dr. V.G. Panse in his special study
WHEAT

Year	Punjab			Uttar Pradesh			Madhya Pradesh		
	Area in '000 acres	Irrigation percentage	Average yield in lbs./acre—actual	Area in '000 acres	Irrigation percentage	Average yield in lbs./acre—actual	Area in '000 acres	Irrigation percentage	Average yield in lbs./acre—actual
I	2	3	4	5	6	7	8	9	10
1910—11	...	...	...	7342	N.A.	891	3585	1.0	608
1911—12	3736	30.6	799	7572	"	897	3611	0.7	536
1912—13	3244	39.8	740	7378	"	892	3600	0.7	638
1913—14	2838	40.0	729	6377	"	780	3268	1.1	450
1914—15	3407	28.8	763	7295	"	934	3265	1.4	516
1915—16	3100	38.9	499	6599	"	917	3505	1.5	600
1916—17	3189	36.8	582	6764	"	1014	3847	1.3	657
1917—18	3514	28.8	632	7248	"	893	3884	1.6	435
1918—19	2485	51.4	766	5444	67.2	948	2780	1.6	553
1919—20	2974	40.7	890	7037	55.4	954	3199	1.4	597
1920—21	2663	49.9	548	6493	61.9	815	2568	2.1	309
1921—22	2989	41.4	855	6809	52.6	879	2448	2.8	621
1922—23	3272	38.1	765	6993	49.1	825	3008	1.3	686
1923—24	3327	37.1	854	7182	32.4	823	3277	1.7	556
1924—25	3383	33.8	601	7402	39.1	734	3306	1.1	623
1925—26	3131	43.2	735	6883	51.0	744	3514	0.9	562
1926—27	3163	42.2	746	6714	55.3	831	3734	1.3	464
1927—28	3151	45.4	738	7467	23.8	708	3664	0.6	361
1928—29	3638	41.6	562	7112	53.2	781	3184	0.6	363
1929—30	3205	47.7	885	7182	53.0	1032	2983	1.3	442
1930—31	3166	46.2	757	7611	45.9	791	3097	1.4	459
1931—32	3025	42.6	612	7748	47.5	755	3513	1.5	429
1932—33	2890	49.8	766	7667	46.8	793	3450	1.8	425
1933—34	3390	36.3	574	8453	45.1	672	3441	1.5	465
1934—35	3065	51.1	720	7549	52.3	749	3626	1.4	471
1935—36	3150	45.6	693	7053	51.0	793	3389	1.9	424
1936—37	3133	44.5	838	7484	44.4	758	3139	1.0	428
1937—38	3381	46.9	823	7810	54.6	798	3357	1.6	449
1938—39	3056	57.9	760	8372	57.4	707	3382	1.8	445
1939—40	2941	55.2	867	7961	57.3	876	3184	2.2	432
1940—41	3069	53.0	771	7787	53.8	797	3229	1.5	397
1941—42	3196	53.1	816	7724	60.5	741	2851	2.1	306
1942—43	3304	45.2	851	7397	53.7	797	2544	2.9	450
1943—44	3146	51.7	774	7524	53.6	736	2668	2.3	311
1944—45	3295	49.7	820	7744	53.4	750	2796	1.9	403
1945—46	3184	49.3	692	7908	55.1	638	2679	2.0	365

Population and Land Use Table 2.3

Yield Rates of principal crops in India used by Dr. V. G. Panse in his special study

JOWAR

Year	Uttar Pradesh			Madhya Pradesh			Bombay			Madras		
	Area in '000 acres	Irrigation percentage	Average yield in lbs./acre—actual	Area in '000 acres	Irrigation percentage	Average yield in lbs./acre—actual	Area in '000 acres	Irrigation percentage	Average yield in lbs./acre—actual	Area in '000 acres	Irrigation percentage	Average yield in lbs./acre—actual
I	2	3	4	5	6	7	8	9	10	11	12	13
1910—11 .	2468		487	4267		544	...		...	...	...	...
1911—12 .	1633		487	3914		564	...		...	...	...	...
1912—13 .	2169		618	3888		565	...		...	5220	N.A.	405
1913—14 .	2063		246	3920		525	...		...	5790	"	419
1914—15 .	2413		585	4299		664	...		...	5102	"	507
1915—16 .	2547		585	4956		744	...		...	5525	"	522
1916—17 .	2402		488	4188		471	...		...	4761	"	678
1917—18 .	1982		420	3820		438	...		...	4890	9.4	639
1918—19 .	1852		239	4652		315	7271		324	5070	10.5	593
1919—20 .	2330		540	4365		638	7803		529	5497	10.6	615
1920—21 .	2313		340	4492		250	8402		305	5221	10.4	609
1921—22 .	2684		540	4983		649	8041		440	5573	10.8	613
1922—23 .	2270		480	4527		599	8237		418	5256	11.9	613
1923—24 .	2479		540	4082		549	7447		342	4547	14.8	613
1924—25 .	2047	NEGLIGIBLE	450	4167	NEGLIGIBLE	514	8635	NEGLIGIBLE	441	4944	11.1	636
1925—26 .	1990	NEGLIGIBLE	447	3838	NEGLIGIBLE	445	7819	NEGLIGIBLE	414	4747	10.7	636
1926—27 .	2301	NEGLIGIBLE	510	4159	NEGLIGIBLE	466	7407	NEGLIGIBLE	407	4692	10.5	578
1927—28 .	2446	NEGLIGIBLE	510	4272	NEGLIGIBLE	523	7220	NEGLIGIBLE	528	4830	10.7	621
1928—29 .	2264	NEGLIGIBLE	330	4169	NEGLIGIBLE	596	7186	NEGLIGIBLE	507	4614	10.6	662
1929—30 .	2469	NEGLIGIBLE	583	4293	NEGLIGIBLE	540	8667	NEGLIGIBLE	424	5174	8.4	642
1930—31 .	2509	NEGLIGIBLE	480	4716	NEGLIGIBLE	561	8627	NEGLIGIBLE	465	4762	8.3	600
1931—32 .	2619	NEGLIGIBLE	450	4290	NEGLIGIBLE	409	7412	NEGLIGIBLE	476	4831	9.3	610
1932—33 .	2381	NEGLIGIBLE	468	4251	NEGLIGIBLE	498	7599	NEGLIGIBLE	469	4535	9.0	638
1933—34 .	2632	NEGLIGIBLE	420	4320	NEGLIGIBLE	531	7761	NEGLIGIBLE	441	4411	9.0	652
1934—35 .	2241	NEGLIGIBLE	450	4334	NEGLIGIBLE	497	7945	NEGLIGIBLE	469	5143	10.1	556
1935—36 .	2237		450	4227		447	7843		449	5103	9.3	601
1936—37 .	2122		449	4658		488	9941		362	5121	8.5	569
1937—38 .	2232		436	4248		559	8073		334	4600	8.7	534
1938—39 .	2245		427	4331		480	7728		383	4913	10.6	577
1939—40 .	2307		528	4791		543	8042		347	5052	8.7	615
1940—41 .	2224		569	4533		536	8155		389	4668	8.8	636
1941—42 .	2129		413	4739		461	8417		329	4905	8.0	554
1942—43 .	2590		554	5307		475	7378		319	4849	9.6	508
1943—44 .	2380		504	5648		528	7586		395	4990	9.4	517
1944—45 .	2267		500	5185		461	8063		338	4645	9.6	579
1945—46 .	2546		496	5046		451	8800		243	4150	10.1	488

Population and Land Use Table 2.4

Yield Rates of principal crops in India used by Dr. V. G. Panse in his special study

MAIZE

Year	Punjab			Uttar Pradesh		
	Area in '000 acres	Irrigation percentage	Average yield in lbs./ acre— actual	Area in '000 acres	Irrigation percentage	Average yield in lbs./ acre— actual
	1	2	3	4	5	6	7
1910—11	...	...	...	2175	N.A.	935
1911—12	636	34.3	863	1791	„	879
1912—13	738	32.1	841	2205	„	935
1913—14	717	31.4	853	2136	„	756
1914—15	710	31.8	565	2376	„	990
1915—16	798	35.8	870	2619	„	990
1916—17	838	29.4	882	2416	„	880
1917—18	818	9.8	602	2321	„	990
1918—19	777	37.7	718	1882	„	605
1919—20	806	33.6	939	2430	7.1	935
1920—21	748	34.4	710	2094	15.1	673
1921—22	761	35.1	774	2075	3.6	880
1922—23	775	33.8	806	1873	4.7	715
1923—24	722	31.7	779	1835	8.5	935
1924—25	649	30.8	835	1550	2.8	770
1925—26	640	30.5	683	1612	3.2	770
1926—27	685	29.6	749	1679	4.8	881
1927—28	738	35.5	823	1862	5.9	935
1928—29	738	36.5	700	2004	23.7	770
1929—30	801	38.2	741	2327	13.3	880
1930—31	765	37.3	767	2375	14.1	880
1931—32	691	31.4	797	2116	10.1	882
1932—33	715	34.1	689	2137	11.9	787
1933—34	738	17.2	565	2023	7.9	770
1934—35	772	36.4	754	2121	4.4	841
1935—36	751	38.7	725	2120	8.2	854
1936—37	738	34.1	753	1965	5.4	612
1937—38	757	38.8	763	1948	21.5	860
1938—39	758	39.1	712	2054	14.5	677
1939—40	791	38.3	779	2098	20.3	911
1940—41	794	37.3	872	2111	13.4	883
1941—42	806	38.8	859	1920	16.7	709
1942—43	858	28.9	768	2424	5.0	874
1943—44	881	37.9	864	2495	4.8	837
1944—45	899	40.5	801	2424	14.6	883
1945—46	864	38.1	770	2536	7.9	852

Population and Land Use Table 2.5
Yield Rates of principal crops in India used by Dr. V. G. Panse in his special study
COTTON

Year	Punjab				Madhya Pradesh				Madras			
	Area in '000 acres	Outturn in '000 tons	Average yield in lbs./acre	Irrigated percentage	Area in '000 acres	Outturn in '000 tons	Average yield in lbs./acre	Irrigated percentage	Area in '000 acres	Outturn in '000 tons	Average yield in lbs./acre	Irrigated percentage
I	2	3	4	5	6	7	8	9	10	11	12	13
1910-11 .	...	...	...	...	4487	810	72		...	...	...	N.A.
1911-12 .	413	69	67	71.2	4648	913	79		2676	308	46	"
1912-13 .	490	119	97	57.8	4494	853	74		2389	282	47	"
1913-14 .	780	204	105	56.0	4754	1004	84		2697	305	45	"
1914-15 .	597	170	114	58.3	4672	1027	88		2087	242	46	"
1915-16 .	268	71	106	58.2	3965	868	88		2060	243	47	"
1916-17 .	361	100	111	55.7	4489	753	67		2168	347	64	"
1917-18 .	564	56	40	48.8	4501	507	46		2700	504	75	"
1918-19 .	316	78	99	71.5	4135	807	78		3133	581	74	"
1919-20 .	547	191	140	71.3	4600	1289	112		2339	408	70	5.6
1920-21 .	550	151	110	67.5	4478	514	46		2150	358	67	6.3
1921-22 .	246	73	119	67.1	4414	1127	102		1803	341	76	7.4
1922-23 .	330	95	115	67.6	4857	1040	86		2348	431	73	7.4
1923-24 .	440	131	110	67.0	4933	1048	85		2658	483	73	8.9
1924-25 .	646	208	129	70.9	5247	1065	81		2903	567	78	9.6
1925-26 .	851	244	115	74.0	5385	932	69		2921	569	78	7.7
1926-27 .	701	164	94	77.3	4864	818	67		2231	388	70	8.3
1927-28 .	471	146	124	77.5	4796	1130	94		2123	447	84	8.8
1928-29 .	692	186	108	86.0	5078	1249	98		2495	528	85	9.5
1929-30 .	614	167	138	83.4	5175	1166	90		2507	513	82	8.4
1930-31 .	617	160	130	83.1	4750	1076	91		2071	381	74	6.7
1931-32 .	672	200	119	82.6	4620	506	44		2228	424	76	8.7
1932-33 .	522	182	139	79.5	4000	723	72		1970	413	84	10.9
1933-34 .	793	220	111	77.3	4270	733	69		2175	452	83	10.5
1934-35 .	673	227	135	77.7	4201	609	58		2320	476	82	12.4
1935-36 .	727	319	176	85.6	4068	654	64		2693	537	80	11.0
1936-37 .	756	355	188	82.9	3952	805	81		2512	497	79	10.9
1937-38 .	811	309	152	83.7	4047	727	72		2572	505	79	11.6
1938-39 .	722	215	119	87.3	3653	547	60		1940	372	77	8.6
1939-40 .	597	242	162	83.6	3270	736	90		2222	455	82	9.6
1940-41 .	572	272	190	81.8	3571	919	103		2441	534	88	12.2
1941-42 .	632	194	123	82.3	3805	1008	106		2556	564	88	12.6
1942-43 .	437	152	139	78.9	3273	551	67		2231	477	86	13.7
1943-44 .	471	170	148	80.5	3203	637	80		2210	485	88	12.5
1944-45 .	417	113	166	81.5	2803	475	68		1686	383	91	10.9
1945-46 .	372	142	153	83.9	2956	546	74		1623	362	89	15.1

Population and Land Use Table 2.6
Yield Rates of principal crops in India used by Dr. V. G. Panse in his special study
SUGARCANE

Year	Punjab			Uttar Pradesh			Madras		
	Area in '000 acres	Irrigation percentage	Average yield in lbs./acre Actual	Area in '000 acres	Irrigation percentage	Average yield in lbs./acre Actual	Area in '000 acres	Irrigation percentage	Average yield in lbs./acre Actual
I	2	3	4	5	6	7	8	9	10
1910-11	...	...	...	1047	N.A	2234	...	...	...
1911-12	167	62.9	1462	1341	"	2105	...	...	...
1912-13	228	68.7	1945	1424	"	2048	99	N.A.	3892
1913-14	243	70.0	1880	1389	"	1572	84	"	4188
1914-15	211	71.6	1953	1194	"	2051	74	"	4208
1915-16	188	72.9	2061	1261	"	2272	95	"	4386
1916-17	218	75.7	2076	1201	"	2087	114	"	5246
1917-18	264	72.3	2138	1484	"	2424	127	"	6403
1918-19	254	63.8	1385	1544	"	1433	123	"	5718
1919-20	266	71.4	2257	1414	73.6	2303	93	84.9	6286
1920-21	244	74.6	1708	1286	75.6	1750	103	81.6	5937
1921-22	179	77.7	1677	1152	74.0	2170	119	89.9	5929
1922-23	235	78.3	2097	1349	73.9	2220	131	94.7	6122
1923-24	253	74.3	2036	1544	72.1	2362	121	85.1	5924
1924-25	223	68.6	1888	1291	68.4	1827	110	97.3	6374
1925-26	217	68.2	1837	1419	69.4	2221	113	96.5	6244
1926-27	244	73.0	1689	1613	71.7	2325	114	97.4	5993
1927-28	249	73.9	1952	1585	73.3	2144	106	96.2	5980
1928-29	198	70.2	1674	1345	66.5	2067	89	95.5	6166
1929-30	140	71.4	1472	1349	76.6	2154	98	95.9	6286
1930-31	200	74.5	1579	1488	74.7	2372	115	96.5	6253
1931-32	213	71.8	1882	1576	73.9	2125	116	96.6	6257
1932-33	268	71.0	1798	1773	72.4	3244	121	96.7	6276
1933-34	222	68.9	1756	1713	63.7	3663	122	95.9	6408
1934-35	228	71.1	1552	1813	63.5	3348	125	96.8	6290
1935-36	234	70.5	1723	2212	68.4	3316	121	94.4	6461
1936-37	269	72.9	2023	2465	66.6	3426	120	95.8	6309
1937-38	261	72.0	1502	2181	62.8	3218	98	93.9	6377
1938-39	165	67.9	2362	1628	66.2	2984	98	94.9	6263
1939-40	199	74.4	1688	1876	72.4	2541	138	93.9	6639
1940-41	268	74.0	1973	2518	67.4	2531	162	96.3	6706
1941-42	213	70.9	2051	1755	67.4	1967	109	93.6	6350
1942-43	218	68.8	2189	1865	72.9	3087	122	95.1	6004
1943-44	260	71.9	2369	2240	69.9	2855	125	95.5	6286
1944-45	286	69.6	2385	2166	63.9	2493	156	88.5	6605
1945-46	273	69.2	2385	1819	68.6	2738	161	95.0	6080

Tables 2.7 & 2.8

In crop cutting surveys, we* have sometimes to ignore districts which are minor in respect of the crop. This has resulted in the division-wise estimates being based in certain cases on a smaller number of districts than those included in the division. Normally, however, 90% of the area under the crop in each division is accounted for by the estimates, except in a few instances indicated in the marginal remarks. The official estimates shown in the statement, refer to the final forecasts issued by the State Governments and may, therefore, slightly differ from the estimates published in the Seasonal & Crop Report which gives only the revised estimates of area and production. In certain states, particularly Bihar and Orissa, the official estimates are not shown in the statements (Tables 2.7 and 2.8) for the first four years. This is because individual district estimates were not supplied in the official forecast. For subsequent years, we have filled in the gap with the information which we have specifically obtained from the states.

All estimates in the statements relate to grains after they are dried after harvesting;

[Also see Notes at the end of each table].

This is an extract from a letter from the Indian Council of Agricultural Research to the Registrar General, India.

Population and Land

Estimates of average yield of RICE in lbs. per acre for the various Natural Divisions of the officially estimated.

State and Natural Division I	1944-45		1945-46		1946-47	
	Survey 2	Official 3	Survey 4	Official 5	Survey 6	Official 7
1. Uttar Pradesh						
Himalayan U. P.
East U. P. Plain	499	498	492	469
Central U. P. Plain	549	N.A.	449	N.A.
Western U. P. Plain	600	N.A.	546	N.A.
U. P. Hills & Plateau	484	N.A.	754	N.A.
2. (a) Bihar (Autumn Rice)						
North Bihar Plain	520	N.A.
South Bihar Plain	333* *	N.A.
Chhota Nagpur	345	N.A.	389	N.A.
(b) Bihar (Winter Rice)						
North Bihar Plain	628	N.A.	599	N.A.
South Bihar Plain	596	N.A.	632	N.A.
Chhota Nagpur	897	N.A.	914	N.A.
3. Orissa Coastal (Autumn Rice)						
(Winter Rice)	713	N.A.	420	N.A.	370	N.A.
4. Assam Plains (Winter Rice)						

5. Madras						
Madras Deccan	866	960
West Madras	1,005	1,076
North Madras	1,033	964	N.A.	N.A.
South Madras
6. Bombay						
Bombay Deccan Northern	696	727	738	681
Bombay Deccan Southern	746	502	808	853
Bombay Gujrat	749	872	830	884
Bombay Konkan	1,122	1,032	1,068	985
Greater Bombay
7. Madhya Pradesh						
North West Madhya Pradesh	525	556	515	487
South West Madhya Pradesh
East Madhya Pradesh	693	667	696	561
8. Coorg						
	1,136	1,042

Notes :—

(1) **Uttar Pradesh :** (i) The survey estimate for 1947-48 (West U. P. division) represents approximately 73% of the and have therefore been excluded for the year. The Official estimate for the year, however, refers to the entire division.

(ii) For the years 1945-46, 1946-47, and 1950-51, official estimates have not been given against some of the divisions as less than 90%.

(2) **Bihar :** (i) Autumn Rice estimates for the South Bihar division for years preceding 1950-51 represent about 80% For 50-51, however, the estimate for the whole state has been used in the case of the districts not covered by the survey, namely

(ii) District-wise estimates are not available for 1948-49 (autumn rice) and so the division wise estimates could not be (autumn) is less than 10% of the area in the division.

(iii) In the case of Monghyr district (winter rice) the area was split half and half between Monghyr North and Monghyr

(3) **Orissa :** As the Surveys were confined mostly to only one district (Sambalpur) of the Inland division, estimates

(4) **Assam :** Figures refer to the tract excluding Goalpara where the Surveys were not conducted during these years.

(5) **Madras :** (i) No experiments in Deccan Division.

(ii) The Survey of 1945-46 covered only seven districts five forming the North division and two of the South division.

(iii) For 1946-47, the Survey covered six districts only in the South division accounting for about 60% of the rice area

(iv) During the next three years Coimbatore and Salem districts alone were not covered by the Survey. But the

(6) **Bombay :** Konkan division includes Bombay Suburban district and these area separate estimates for the Greater

(7) **Madhya Pradesh :** (i) The North West division figures represent about 75% of the area under rice in the division.

(ii) No experiments in the South-West division.

Use Table 2.7

Indian Union as obtained by crop-cutting surveys by the random sampling method and as

1947-48		1948-49		1949-50		1950-51	
Survey 8	Official 9	Survey 10	Official 11	Survey 12	Official 13	Survey 14	Official 15
...
528	433	625	533	465	510	380	343
590	604	607	669	501	651	461	N.A.
549*	603	545	641	501	643	495	N.A.
526	614	608	620	418	624	413	N.A.
515	N.A.	N.A.	N.A.	485	485	456	456
367*	N.A.	N.A.	N.A.	436*	436*	361	361
378	N.A.	374	532	374	374	316	316
644	N.A.	573	652	552	552	327	327
508	N.A.	596	557	532	532	290	290
864	N.A.	773	696	763	763	591	591
298	N.A.	...	...	441	374	...	...
652	N.A.	702	546	656	429	722	427
1001	985	990	986	927	997	829	765
...
745	800	839	998	778	887	760	921
1,046	1,082	1,075	1,089	827	844	1,082	1,029
923	783	913	854	849	844	1,016	859
499	759	611	659	537	779	532	546
935	763	844	642	769	685	940	933
613	745	367	461	576	771	478	500
1,009	1,003	1,080	893	959	890	957	959
...
579	590	542	521	617	562	307	314
...
725	680	656	604	811	733	545	428
984	846	1,356	1,112	1,145	906	1,221	1,050

area under rice in the division. Separate estimates for the districts Bijnor, Moradabad and Farrukhabad are not available separate estimates are not available for a few of the constituent districts thereby rendering the percentage area covered only of the area under autumn rice in the division as the surveys were confined to the two districts of Shahbad and Bhagalpur. all except Shahbad. given. For Chhota Nagpur, however, the pooled estimate is available excluding Santal Parganas where the area under rice South while the same average yield represented the two halves. have not been given for the division.

in the division. As such estimates have not been given. total area covered in the South division was more than 90%. Bombay division as such.

the surveys covering only the districts of Sagar (Damoh Tehsil only), Jubbalpur, Mandla and Chhindwara (Seoni Tehsil only)

**Population and
Estimates of average yield of wheat**

State and Natural Division	1943-44		1944-45		1945-46		1946-47	
	Survey	Official	Survey	Official	Survey	Official	Survey	Official
I	2	3	4	5	6	7	8	9
Uttar Pradesh								
Himalayan U. P.]	646	940	499	737	516	786
East U. P. Plain	784	876	706	676	725	753
Central U. P. Plain]	671	723	774	692	702	696
West U. P. Plain	673	750	583	616	612	643
U. P. Hills & Plateau	542	570	634	513	504	445
Bihar								
North Bihar Plain	501	N.A.	512	N.A.
South Bihar Plain	404	N.A.	456	N.A.
Chhota Nagpur
Bombay								
Bombay Deccan Northern	398	413	28	136
Bombay Deccan Southern	146	150	21	29
Gujrat	376	409	279	152
Bombay Konkan & Greater Bombay
Madhya Pradesh								
North-West M. P.	430	447	417	373	103	118
East M. P.	271	353	372	356	125	141
South-West M. P.	340	361	448	346	26	38
Punjab								
Himalayan Punjab	566	504	637	504	633	388	...	...
Punjab Plain	929	840	904	866	877	717	...	...
Ajmer	536	656
Delhi	626	491

NOTE.—(1) Palamau district of Chhota Nagpur division in Bihar was alone covered by the Survey.
(2) No experiments in Konkan and Greater Bombay where wheat area is nil.

Land Use Table 2.8

in lbs. per acre for the various natural divisions.

1947-48		1948-49		1949-50		1950-51	
Survey	Official	Survey	Official	Survey	Official	Survey	Official
10	11	12	13	14	15	16	17
448	852	398	666	666	1000	754	755
662	741	431	490	673	758	731	666
732	763	578	603	621	600	866	746
663	793	610	689	783	756	826	756
571	580	624	546	674	500	666	687
		624					
		624					
692	N.A.	589	N.A.	506	506	381	381
511	N.A.	448	N.A.	458	458	418	418
...
332	493	319	399	406	482	371	338
170	179	59	112	192	205	208	218
394	369	265	365	377	388	542	533
...
365	376	613	560	503	467	651	632
259	295	384	393	365	367	339	362
275	258	335	346	337	334	422	372
597	532	521	512	630	551	597	575
789	752	892	818	1024	947	915	831
647	533	717	717	512	379	793	459
719	452	715	513	838	526	245	560

**Population and
Classification of land area population, and land area**

Land

<i>Agricultural Area</i>								
<i>India & World Population Divisions</i>	<i>Total (in '000 sq. miles)</i>	<i>Arable land (including fallow & orchards)</i>		<i>Permanent meadows & pastures</i>		<i>Forests and woodlands</i>		
		<i>in '000 sq. miles</i>	<i>per '000 sq. miles of land area</i>	<i>in '000 sq. miles</i>	<i>per '000 sq. miles of land area</i>	<i>in '000 sq. miles</i>	<i>per '000 sq. miles of land area</i>	
1	2	3	4	5	6	7	8	
INDIA	1,270	546	430	...	...	146	115	
Urasia								
1. Europe	1,903	568	298	370	194	494	260	
2. U. S. S. R.	9,225	869	94	479	52	3,552	385	
3. East Asia	3,868	392	101	751	194	482	125	
4. South East Asia	1,728	163	94	4	2	995	576	
5. South Central Asia	1,687	615	365	..	..	174	103	
6. South West Asia	2,320	154	66	238	103	133	57	
Africa								
7. Africa	11,745	722	62	2,236	190	3,544	302	
Americas								
8. North America	7,139	851	119	1,205	169	2,506	351	
9. South & Central America	7,374	326	41	1,731	220	3,310	421	
Oceania								
10. Oceania	3,304	73	22	1,421	430	294	79	
World Total	50,793	4,733	93	8,435	166	15,484	305	
Selected Countries								
1. China	3,646	351	96	750	206	324	89	
2. U. S. S. R.	9,225	869	94	479	52	3,552	385	
3. U. S. A.	2,977	711	239	1,034	347	975	328	
4. Japan	141	23	163	2	14	96	681	
5. Indonesia	735	42	57	...	...	467	635	
6. Pakistan	377	80	212	...	...	12	32	
7. Germany	92	33	359	21	228	27	293	
8. United Kingdom	93	29	312	47	505	6	65	
9. Brazil	3,268	73	22	512	157	1,528	468	
10. Italy	114	60	526	20	175	23	202	
11. France	213	82	385	47	221	43	202	

Land Use Table 3.0

per capita in ten population divisions of the World and 12 countries

Area		Land Area (in acres) per Capita (in cents)					
Other land area			Agricultural area				
in '000 sq. miles	per '000 sq. miles of land area	Latest estimated number (in thousands)	Total	Arable land (including fallow & orchards)	Permanent meadows & pastures	Forests and woodlands	Other land area
9	10	11	12	13	14	15	16
578	455	361,239	225	97	..	26	102
471	248	396,388	307	92	60	79	76
4,325	469	193,900	3,045	287	158	1,172	1,429
2,243	580	579,934	427	43	83	53	248
566	328	163,603	676	64	2	389	221
898	532	452,877	239	87	...	25	127
1,795	774	74,849	1,984	132	203	114	1,535
5,243	446	197,984	3,797	233	723	1,146	1,695
2,577	361	165,728	2,757	329	465	968	995
2,507	318	161,860	3,113	129	684	1,309	991
1,516	459	12,910	16,379	362	7,045	1,457	7,515
22,141	436	2,400,033	1,354	126	225	413	590
2,221	609	463,500	503	48	103	45	307
4,325	469	193,900	3,045	287	158	1,172	1,428
257	86	150,697	1,264	302	439	414	109
20	142	83,200	109	18	2	74	15
226	308	73,500	640	37	...	406	197
285	756	75,842	318	68	...	10	240
11	120	47,696	123	44	28	36	15
11	118	50,212	119	37	60	8	14
1,155	353	52,645	3,973	89	622	1,858	1,404
11	97	46,738	156	82	27	32	15
41	192	42,300	322	124	71	65	62

Population and Land Use Table 3.1
Comparison — India, the World, Europe & Asia
and Africa, Americas and Oceania

		<i>India</i>	<i>World</i>	<i>Europe, Africa, Americas & Asia and Oceania</i>	
1		2	3	4	5
A—	Population (in crores)	36	240	186	54
	Land Area (in crores of acres)	81	3251	1327	1924
	Land Area Per Capita (in cents)	225	1354	713	3573
	Topographically Usable Area Per Capita (in cents)	151	921	421	2672
	Arable Farm Land Per Capita (in cents)	97	126	95	234
B—	Percentage of total Land Area which is topographically Usable	67	68	59	75
	Percentage Total Land Area which is used for Arable Farming	43	9	13	7
	Percentage of topographically usable area which is used for Arable Farming	65	14	23	9
C—	Irrigation Percentage	14	8	10	4

Population and Land Use Table 3.2

Irrigation in the World, the Continents, India and the six zones

Territory	Area adapted to agricultural production (In lakhs of acres)	Irrigated area (In lakhs of acres)	Percentage of irrigated area to area adapted to agricultural production
1	2	3	4
THE WORLD			
(excluding Antarctica)*	25,800	2,005	7.8
Asia	6,000	1,408	23.5
Europe	8,900	148	1.7
North America	5,700	268	4.7
Africa	2,400	103	4.3
South America	2,200	66	3.0
Oceania	600	12	2.0
INDIA	3,278††	468	14.3
<i>Zones</i>			
North India	419	114	27.2
East India	555	106	19.1
South India	523	118	22.6
West India	547	21	3.8
Central India	892	38	4.3
North-West India	342	71	20.8†††

*Source of figures for the World and the continents—'World's Hunger' by FRANK A. PEARSON and FLOYD A. HARPER.

††'Net area sown' plus 'fallow land' has been taken to be as 'area adapted to agricultural production' in India and zones.

For India, the net area sown is 2684 lakhs of acres ;

Fallow land is 594 lakhs of acres.

TOTAL . . . 3278

†††The figures of area adapted to agricultural production and irrigated area given in the statement for India and the six zones relate only to those areas for which village papers are available and not to the entire land area. The percentage of area for which village papers are available in India is 76.73 and each of the six zones is as follows : North India 99.30; East India 72.23 ; South India 97.23 ; West India 84.66 ; Central India 98.51 ; North-West India 34.28.

Population and Land Use Tables 4.0 to 4.3

Population and Land Utilization in Great Britain

by Dr. V. Nath, M.A., Ph. D., of the Planning Commission.

(1) Tables 4.0 and 4.1 show the trends in population and land utilization in Great Britain. The figures of Table 4.0 are for England and Wales and show long period trends from 1870 onwards; those of Table 4.1 are for the United Kingdom and show the trends during World War II and Post-war years.

(2) The population of England and Wales almost doubled during the period—1870 to 1950, the increase being from 22.7 million in 1870 to 44 million in 1950. The most rapid increase took place between 1870 and 1914, by which time population was already about 37 million. After 1914 increase in population has been much slower. This, as is well known, has been due to the marked decline in the British birth-rate. The total area of crop and grass-land, excluding rough grazing, has not changed greatly during this entire period. It was 26.0 million acres in 1870, showed an increase to 27.5 million acres in 1900, but has shown a small decline after that date. After 1937, this acreage has fluctuated between 24 and 25 million acres. This trend in the acreage of crop-and-grass land is characteristic of old densely populated countries, and indicates that practically all the land, which could be brought under use as either crop land or permanent pasture, was already being utilized by 1870, and there was little room for expansion. The small decline in this total acreage which is observed over this period is due most probably to diversion of some of the land to non-agricultural uses such as industries, roads and railways, towns and cities.

(3) Although the total area of crop-and-grass land has not changed much over this period, its distribution between crop land and grassland has shown marked changes, and these changes provide an excellent indicator of the changes which have taken place in British agriculture during this period.

(4) During the 19th Century, the opening up of vast areas of fertile lands in the new world, and development of means of transport, especially the railways and the steam-ships, brought large quantities of grains at progressively lower prices to Britain and the other countries of Western Europe. Under the competition of cheap grain from these countries, the patterns of agriculture in Britain and European countries began to change. The emphasis shifted from cultivation of food crops to production of live stock products, fruits, vegetables etc. Large areas especially in Great Britain were withdrawn from cropping and put under grass. It will be seen from Table 4.0 that the total acreage under crops declined from 11.7 million acres in 1870 to 9.0 million acres in 1900. During the same period, area under permanent grass increased from 11.1 million acres to 15.3 million acres. Also, it will be noticed that among the crops, the worst suffered was wheat, the principal food-grains for human consumption.

(5) This trend towards dependence upon foreign supplies of grains and concentration in domestic agriculture upon livestock and other subsidiary agricultural industries like vegetable-growing, continued after 1900 and barring a brief reversal during World War I, right-up to 1937. It was made possible by availability of cheap grains from the new lands of the world which required markets, and was sustained by rising standards of living at home (because of industrialization), as a result of which larger and larger quantities of milk, meat, fruits, vegetables and similar expensive foods were demanded by the consumers.

(6) But these trends greatly increased dependence upon foreign supplies of food. Besides, grain for human consumption, a large part of foodgrain for supporting the live-stock industries, and increasing quantities of meat, butter, cheese, eggs and other products, were obtained from outside. By 1937, dependence of Great Britain on over-seas sources of supplies was so much that it was estimated that the domestic production contributed only

31% of the food supply in terms of calories. "Before the war, Britain produced about half her total meat supplies, and some 80% of vegetables, all fresh milk, and some two thirds of other milk and of her eggs, but less than one-fourth of the cheese, about 16 per cent of oils and fats, and 12 per cent of wheat and flour intended for food, about 25 per cent of the fruit and 17 per cent of the sugar."

—Agriculture in Britain, Central Office of Information, London, page 8.

(7) During the war years, however, when the over-seas supplies of food were very much reduced, it became absolutely necessary to increase domestic food production as much as possible. Large areas of permanent grass-land were ploughed and brought under grains, potatoes and other crops. It will be seen from Table 4.1 that the acreage under wheat in U. K. increased from 1.9 million acres in 1938 to 3.5 million acres in 1943; that under barley increased from about 1 million acres to 1.8 million acres, and that under potatoes from .7 million acres to 1.4 million acres. The total area under crops during this five year period increased from 9 million acres to 14.5 million acres, while that under grass was reduced from 18.8 million to 12.3 million acres. After 1943, however, there was no marked change till the end of the war. During the post-war years, with gradually increasing availabilities of food and feed grains from abroad, there has again been a shift in the reverse direction. But this has not been very large, so that even in 1951 the acreage under crops was 12.2 million acres or more than 3 million acres above that in 1938 and under grass only 13.13 million acres as against 18.8 million acres in 1938. As a result of these changes, Britain is producing much more of her food at home than it used to before the war. This is brought by the following figures :—

Contribution of Home Production to Food Supplies Nutrient equivalent of food consumption per head per day.

	Pre-War		1947-48.		1948-49	
	Home Production	Per cent of total consumption	Home Production	Per cent of total consumption	Home Production	Per cent of total consumption
Calories	920	31	990	35	1,120	37
Animal protein (gm)	26.7	63	26.0	63	26.9	66
Vegetable protein (gm)	9.3	25	14.2	31	18.6	39
Total Protein (gm)	36.0	45	40.2	46	45.5	51

Source : Economic Survey for 1949. Cmd. 7647. H. M.S.O. London. Table 6.

(8) The story of Britain is the story par excellence of Western Europe. Rapid increase in population, decline in cultivation per capita cause of little or no increase in area of arable land : increased availability of grain (and later of other feeds), (there are lands of new world) increasing emphasis in domestic agriculture upon livestock and other subsidiary agricultural industries, leading to increasing dependence upon foreign supplies for not only foodgrains; but also for feed-grains and livestock products like, meat, butter, cheese, eggs, etc.

Such a system which is sustained by the exchange of industrial products for the products of the land is, as we have seen, subject to severe strain during times of war, when foreign supplies are cut off. In spite of the best efforts it is not possible for such countries to attain self-sufficiency in food. It will be seen from the above statement that, even with all its efforts, Britain could not produce more than about 40% of its total food requirements in terms of calories.

Table 4'0
Trends in Land Use since 1870
England and Wales

[IN THOUSANDS]

	1870	1900	1914	1924	1937	1946	1948	1949	1950
Population	22,712	32,528	36,615	38,507	41,031	42,700	43,502	43,780	44,000
(i) Cropped area (Tillage)	11,684	9,053	8,617	8,381	6,803	10,662	10,682	10,227	10,460
(ii) Temporary grass	3,165	3,165	2,381	2,548	2,221	3,707	3,457	3,696	3,776
(iii) Permanent grass	11,108	15,321	16,116	14,948	15,756	9,947	10,263	10,456	10,505
(iv) Total arable land (i and ii)	14,849	12,218	10,998	10,929	9,024	14,369	14,139	13,923	13,936
(v) Arable land per capita (acres)	0.65	0.38	0.30	0.28	0.22	0.34	0.33	0.32	0.32
(vi) Total crop and grass land (i, ii and iii).	25,957	27,539	27,114	25,877	24,780	24,316	24,402	24,379	24,741
Rough grazings	3,203	3,557	3,782	4,946	5,442	5,590	5,559	5,532	5,466
Wheat	3,375	1,796	1,807	1,545	1,732	1,982	2,188	1,899	2,395
Barley	2,128	1,750	1,505	1,314	823	2,003	1,897	1,885	1,625
Oats	1,744	2,077	1,930	2,038	1,223	2,155	1,992	1,946	1,835
Potatoes	407	430	462	452	455	1,009	1,117	929	867
Turnips and swedes	1,712	1,223	1,045	832	440	421	355	339	301
Mangolds	305	412	433	390	207	296	272	267	267
TOTAL NUMBER OF CATTLE	4,362	5,007	5,878	5,895	6,619	7,244	7,340	7,695	8,001

Table 4.1
Area of Crops and Grassland (1) in United Kingdom

[IN THOUSAND ACRES]

	1938	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
1. Crop and fallow :											
Total	8,989	13,666	14,509	14,548	13,849	13,300	12,880	13,180	12,643	12,824	12,202
Wheat	1,928	2,516	3,464	3,220	2,274	2,062	2,163	2,279	1,963	2,479	2,131
Barley	988	1,528	1,786	1,973	2,215	2,211	2,060	2,083	2,060	1,778	1,908
Oats	2,395	4,133	3,680	3,656	3,753	3,567	3,308	3,335	3,252	3,105	2,857
Mixed corn	95	546	501	424	433	458	498	598	680	838	836
Rye (grain)	17	59	129	120	80	55	35	61	64	71	54
Potatoes	733	1,304	1,391	1,417	1,397	1,433	1,330	1,548	1,308	1,235	1,050
Sugar beet	336	425	417	431	417	436	395	413	421	429	429
2. Temporary grassland :											
Total	3,968	3,831	4,219	4,725	5,334	5,679	5,651	5,484	5,726	5,531	5,796
For mowing (8)	1,783	2,102	2,333	2,491	3,830	2,902	2,963	2,724	2,937	2,754	3,004
For grazing	2,185	1,729	1,885	2,234	2,505	2,777	2,688	2,760	2,789	2,777	2,792
3. Permanent grassland :											
Total	18,798	13,706	12,330	11,735	11,840	12,030	12,404	12,398	12,687	12,770	13,133
For mowing (8)	4,623	3,533	2,992	2,613	2,702	2,599	2,899	2,962	2,941	3,074	3,129
For grazing	14,175	10,173	9,339	9,122	9,137	9,432	9,505	9,436	9,746	9,696	10,004
4. Crops and grass(2) :											
Total (1+2+3)	31,755	31,204	31,058	31,008	31,023	31,010	30,935	31,062	31,056	31,126	31,131
Arable land (1+2)	12,957	17,497	18,728	19,273	19,183	18,980	18,531	18,664	18,369	18,356	17,998
Permanent grass-land.	18,798	13,706	12,330	11,735	11,840	12,030	12,404	12,398	12,687	12,770	13,134
5. Rough grazings :											
Total	16,589	16,959	17,119	16,985	17,260	17,263	17,163	17,211	17,192	17,103	17,066

(1) Excluding holdings of one acre or less in extent in Great Britain and less than one quarter of an acre in Northern Ireland.

(2) Excluding rough grazings. Including estimates for certain items (mainly among fodder and horticultural crops) not separately returned in June.

(3) Including 87,000 acres temporarily out of use through flooding.

(7) Clover and rotation grasses ; including lucerne before 1950.

(8) For hay, silage, drying or seed production.

Source : Agricultural Department.

Population and Land Use Table 4.2
Area of Crops and Grasslands (1) in United Kingdom by Use

[IN THOUSAND ACRES]

	1938	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
<i>Crops and grass (2) :</i>											
Total . . .	31,755	31,204	31,058	31,008	31,023	31,010	31,022(3)	31,062	31,056	31,126	31,113
Arable land . . .	12,957	17,497	18,728	19,273	19,183	18,980	18,531	18,664	18,369	18,356	17,991
Permanent grass-land.	18,798	13,706	12,330	11,735	11,840	12,030	12,404	12,398	12,687	12,770	13,113
<i>Crops and fallow :</i>											
Total . . .	8,989	13,666	14,509	14,548	13,849	13,300	12,880	13,180	12,643	12,824	12,201
Wheat . . .	1,928	2,516	3,464	3,220	2,274	2,062	2,163	2,279	1,963	2,479	2,111
Barley . . .	988	1,528	1,786	1,973	2,215	2,211	2,060	2,083	2,060	1,778	1,991
Oats . . .	2,395	4,133	3,680	3,656	3,753	3,567	3,308	3,335	3,252	3,105	2,897
Mixed corn . . .	95	546	501	424	443	458	498	598	680	838	817
Rye (grain) . . .	17	59	129	120	80	55	35	61	64	71	51
Potatoes . . .	733	1,304	1,391	1,417	1,397	1,423	1,330	1,548	1,308	1,235	1,051
Sugar beet . . .	336	425	417	431	417	436	395	413	421	429	411
<i>Temporary grassland(7) :</i>											
Total . . .	3,968	3,831	4,219	4,725	5,334	5,679	5,651	5,484	5,726	5,531	5,771
For mowing (8)	1,783	2,102	2,333	2,491	2,830	2,902	2,963	2,724	2,937	2,754	3,001
For grazing . . .	2,185	1,729	1,885	2,234	2,505	2,777	2,688	2,760	2,789	2,777	2,770
<i>Permanent grassland :</i>											
Total . . .	18,798	13,706	12,330	11,735	11,840	12,030	12,404	12,398	12,687	12,770	13,113
For mowing (8)	4,623	3,533	2,992	2,613	2,702	2,599	2,899	2,962	2,941	3,074	3,111
For grazing . . .	14,175	10,173	9,339	9,122	9,137	9,432	9,505	9,436	9,746	9,696	10,002
Rough grazings	16,589	16,959	17,119	16,985	17,260	17,263	17,163	17,211	17,192	17,103	17,061

(1) Excluding holdings of one acre or less in extent in Great Britain and less than one quarter of an acre in Northern Ireland.

(2) Excluding rough grazings. Including estimates for certain items (mainly among fodder and horticultural crops) not separately returned in June.

(3) Including 87,000 acres temporarily out of use through flooding.

(7) Clover and rotation grasses; including lucerne before 1950.

(8) For hay, silage, drying or seed production.

Source : Agricultural Department.
Annual Abstract of Statistics
(U.K.) 1952.

Population and Land Use Table 4.3
Estimated Yield per Acre⁽¹⁾

<i>Unit</i>	1938	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
Wheat . Cwt.	20.4	20.4	19.9	19.5	19.1	19.1	15.4	20.7	22.5	21.0	21.7
Barley . Cwt.	18.3	18.9	18.4	17.8	19.0	17.8	15.7	19.5	20.7	19.2	20.3
Oats . Cwt.	16.6	17.2	16.7	16.2	17.3	16.3	15.2	17.8	18.4	17.3	18.3
Potatoes . Tons	7.0	7.2	7.1	6.4	7.0	7.1	5.8	7.6	6.9	7.7	7.9

(1) Excluding holdings of one acre or less in extent in Great Britain and less than one quarter of an acre in Northern Ireland.

Source : Agricultural Departments
Annual Abstract of Statistics
(U. K.) 1952.

Population and Land Use Table 5·0 to 5·5

Population, Land Utilization and Agricultural Production in the United States.

(by Dr. V. Nath, M.A., Ph.D. of the Planning Commission).

POPULATION AND LAND UTILIZATION (Tables 1 and 2)

(1) The figures of Tables 5·0 and 5·1 extend over the 100 year period—1850—1950. During the first half of this period, 1850 to 1900, the United States saw the most rapid expansion of settlement and cultivation in its history, caused by the opening up of vast areas of fertile lands in the Middle-Western and Western parts of the country. This process of expansion of settlement had been going on in the U. S. for more than two centuries before 1850. But it reached its peak during this period. There were two main reasons for this:

(i) Development of transport facilities especially the railroad and the steam-ship. The former linked up the new lands with the older settlements in the East, brought large numbers of settlers to the new lands, and carried food-grains and other produce from these lands to the markets of the East and for exports overseas. The latter, by greatly reducing the time and cost of transport to foreign markets helped in rapidly expanding the exports from the newly settled areas.

(ii) By this period, the wave of settlement had already crossed the forested areas of Eastern United States. Settlement in this period was mainly in open grassland country and was, therefore, much more easy and rapid.

(2) Settlers to the new lands came from the older settlements in Eastern United States, and also from the countries of Northern and Western Europe, especially Great Britain, France, Holland, Belgium, Germany and the Scandinavian countries. In order to facilitate rapid settlement of these lands special laws called the Homestead Laws were passed. Under these, a specified area (generally 160 acres, more in dry parts) was given free to any settler who would develop the land and establish a family farm. (See two extracts below from the Homestead Laws). Large grants of land were also given to rail-roads and other enterprises for development of settlements.

“Every person who is the head of a family, or who has arrived at the age of twenty-one years, and is a citizen of the United States, or who has filed his declaration of intention to become such, as required by the naturalization laws, shall be entitled to one-quarter section* or a less quantity, of unappropriated public lands, to be located in a body in conformity to the legal sub-divisions of the public lands”.

“Any person who is a qualified entryman under the homestead laws of the United States may enter, by legal sub-divisions, under the provisions of this section, in the States of Arizona, California, Colorado, Kansas, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming, *three hundred and twenty acres, or less* of nonmineral, nonirrigable, unreserved, and unappropriated surveyed public lands which do not contain merchantable timber, located in a reasonably compact body, and not over one and one-half miles in extreme length: Provided, that no lands shall be subject to entry under the provisions of this section until such lands shall have been designated by the Secretary of the Interior as not being, in his opinion, susceptible of successful irrigation at a reasonable cost from any known source of water supply”.

(3) By 1900, however, the greater part of the new lands had been occupied, and the process was virtually completed by 1920. It will be seen from the figures of table 5·0 that total farm land which stood at 294 million acres in 1850, had increased to 839 million acres by 1900. The area of cropland (Table 5·1) increased even more rapidly—from 76 million acres in 1850 to 319 million acres in 1900. By 1920, it totalled 402 million acres. After 1920, however, there has been practically no increase in cropland. The figures of different years show small variations, but these are due mainly to seasonal or economic factors. Figures of the total area of farmland continue to show some increases after 1920. But this is due not to any expansion of cultivation, but mainly to the transfer of certain public grazing lands to private ownership. The total increase in farmland between 1920 and 1945 is of the order of 200 acres, and is entirely due to increase in area of farm pastures.

*One quarter section equals 160 acres.

The area of Non-farm grazing lands shows corresponding decrease during the period.

(4) Side by side with expansion in cultivation after 1850, there was a very rapid increase in population also. The population of U. S. A. increased from 23 million in 1850 to 76 million in 1900 and to 106 million in 1920. Large numbers of immigrants, attracted by the opportunities afforded by the opening up of vast new lands and the growth of industries and towns flooded the country.

Immigration was in the early part of this period mainly from the countries of Northern and Western Europe, but as time went on larger and larger numbers came from countries of Central, Southern and Eastern Europe. After 1900, the latter countries were sending the largest number of immigrants. For a time, expansion in cultivation was even more rapid than population increase, with the result that cropland *per capita* which was 3.3 acres in 1850, increased to 4.2 acres by 1900. After 1900, however, population increase, outstripped increase in cultivation and cultivation *per capita* began to decline. After 1920, cultivation has increased very little, but population increase has continued. Between 1920 and 1950, population has increased from 106 million to 151 million, cultivation has increased only from 402 to 409 million acres, and cultivation *per capita* has declined from 3.8 acres to 2.7 acres, or nearly 30%.

B. CROP PRODUCTION AND EXPORTS

(5) Tables 5.2, 5.3 and 5.4 show the trends in acreage, production, imports and exports of wheat, corn and cotton, the three most important crops of the United States.

WHEAT : [TABLE 5.2(i) AND 5.3 (i)]

(6) Table 5.2 (i) shows, acreage, production, yields etc. of wheat from 1866 onwards. Table 5.3 (i) shows the exports of wheat and wheat flour from 1852 onwards. It will be seen that acreage under wheat which averaged about 22 million acres in the decade—1866—1875, increased to about 47 million acres by the turn of the century. Production during the same period increased from 270 million bushels to about 630 million bushels and exports from about 50 million bushels to about 200 million bushels. This rapidly rising trend was checked during the next decade or so, but was resumed with the beginning of World War-I. Especially, in the years following the World War-I, when there

was a large over seas demand for wheat and prices of wheat were very high, acreage and production of wheat showed a large increase. During the quinquennium—1916 to 1920—acreage increased to nearly 60 million acres, production to about 800 million bushels and exports to 240 million bushels. All these figures, were record figures upto that time. After 1920 however, with the gradual return of normal conditions in the war-affected countries of Europe, exports demand decreased and prices declined. Domestic production continued to be fairly high for some years, but with the coming of the depression in the early thirties, there was a sharp decline. The lowest figures for acreage production and exports in the inter-war years were recorded between 1931 and 1935 when the acreage was only about 52 million acres production 681 million bushels and exports about 50 million bushels. With the entry of the United States in World-War II in 1941, prices again began to increase rapidly and production also increased. Acreages production and exports of wheat have been at "all-time highs" during the recent post-war years. During the post-war years—1946—50—acreage under wheat has averaged over 70 million acres, production about 1.2 billion bushels and exports about 400 million bushels.

CORN : [TABLE 5.2 (ii) AND 5.3 (ii)]

(7) Corn is the most important grain crop of the United States. Between 1/4 to 1/5 of the cropland of the country is devoted to its production and it accounts for about one-half of the entire cereal production of the country. Corn, however, is produced in the United States almost exclusively for livestock feed: chiefly for feeding hogs, beef and dairy cattle. The balance is divided between industrial uses and human consumption. Thus, the quantity used for direct human consumption is generally not more than about 5% of the total crop.*

*Average disposition of corn production for 1942-46 was as follows :—

	Thousand bushels
Human consumption (incl. breakfast foods, etc.)	99,312
Industrial Uses	160,115
Seed	12,687
Feed, other uses and waste	2,790,466
Exports	35,605
TOTAL	3,098,185

It will be seen from table 5.2 (ii) that the production of corn increased from about 1 billion bushels in the decade, 1866-1875, to about 2.5 billion bushels by the turn of the century. After that, increase was rather slow. During the quinquenniums 1916-20 and 1921-25 production reached 2.7 billion bushels, but after this there was a decline again, and during the depression years of the 1930's, production was low, the average for the quinquennium—1936-40—being only 2.35 billion bushels. Production began to increase during the war years under the influence of increased demand and high prices, and in the post-war years, 1946-50, it has reached an all time high average of 3.15 billion bushels.

(8) It is of interest to note that the record crops of the recent post-war years have not been achieved by increasing the acreages under corn. Acreages under the crop during these years have actually been lower than in earlier years. The large increase in production is due entirely to higher yields per acre. Yields of corn during the 1940's have been considerably higher than in the earlier years. Part of the increase is due to favourable weather conditions during these years. Another important reason is the marked increase in corn yields in recent years, caused mainly by the introduction of hybrid corn which gives much higher yields per acre than the ordinary varieties.

(9) Exports of corn are shown in Table 5.3(ii). These have never been large, as the bulk of the corn crop is used within the country for livestock feeding.

COTTON (TABLE 5.4)

(10) Cotton is the most important non-food crop in U.S.A. Figures of production and exports imports etc. shown in this table are from 1905 onwards. Production of cotton had by this time already reached a level, which has not been greatly exceeded since. Production in 1905 was 13.45 million bales and the average for the quinquennium, 1905-09 was 12.2 million bales. In only two quinquennia since that time has production been larger. The highest average production for any quinquennium was about 15 million bales in 1925-29, and the lowest was 10.5 million bales in the quinquennium immediately preceding it *i.e.*, in 1920-1924.

These variations are fluctuations caused mainly by seasonal and demand factors. They do not reveal any secular trends, and one can say that the level of cotton production in the U. S. A., has remained more or less unchanged over the last 40 years.

(11) Domestic consumption of cotton, however, has been steadily increasing during this period. During the quinquennium, 1905-09, domestic consumption averaged about 4.7 million bales or a little more than 1/3 of the production, leaving about 7.5 million bales for export. From this figure of 4.7 million bales, domestic consumption has progressively increased and during the war years 1940 to 1944 and the post-war years 1945-1949 it has averaged about 10 million bales. Even if the normal demand may be considered to be somewhat lower, say, between 8 to 10 million bales, it is certain that the surplus available for exports is now much less than it was 40 years ago.

FERTILIZER CONSUMPTION (TABLE 5.5)

(12) We have referred above to the increase in yield of corn. In fact, increase in crop yields has been an important feature of U. S. agriculture in recent years. Yields of all important grains—wheat, corn, oats, barley, and also of other crops like cotton have shown significant increases during recent years. These increases have been brought about by improvement in agricultural techniques ; by the application of scientific knowledge to agriculture on an increasing scale. Increased use of machinery leading to more intensive and more efficient cultivation, improved seeds (of which hybrid corn is an outstanding example), greater use of fertilizers, better control over pests and diseases, improvement in livestock through better methods of breeding and feeding are some of the features of this improvement in agricultural techniques. An index of the trends in agricultural improvement is given by the figures of the use of commercial fertilizers. These figures are available for the last 100 years and have been produced in table 5.5. It will be seen from these, that the use of fertilizers has been increasing steadily and that it has gone up especially rapidly during the war and post-war years. The limit of cultivation having been reached, the emphasis in U. S. A., as in all countries, is now on intensification of agriculture.

Population and Land Use Table 5:0

Land Utilization in U.S.A.—Land and Water Area, By Type: 1850-1945

(In millions of acres. Total farm land and total nonfarm land acreages are for the calendar year indicated; cropland and pasture land acreages usually relate to the preceding year.)

Year	Total Area*			Farm Land					Nonfarm Land			
	Grand Total	Land	Inland Water	Total	Crop-land	Farm Pasture	Farming Woodland	Other land in farms	Total	Grazing land**	Forest land**	Other non-farm land
1	2	3	4	5	6	7	8	9	10	11	12	13
1945	1,934	1,905	29	1,142	403	529	166	44	763	292	322	149
1940	1,934	1,905	29	1,061	399	461	157	44	844	382	325	137
1935	1,937	1,903	34	1,055	416	410	185	44	848	411	306	131
1930	1,937	1,903	34	987	413	379	150	45	916	437	349	130
1925	1,937	1,903	34	924	391	331	144	58	979	495	354	130
1920	1,937	1,903	34	956	402	328	168	58	947	502	319	126
1910	1,937	1,903	34	879	347	284	191	57	1,024	600	301	123
1900	1,937	1,903	34	839	319	276	191	53	1,064	625	318	121
1890	1,937	1,903	34	623	248	144	190	41	1,280	818	344	118
1880	1,937	1,903	34	536	188	122	190	36	1,367	883	368	116
1870	1,937	1,903	34	408	189***	...	219†	...	1,495	‡	‡	‡
1860	1,937	1,903	34	407	163***	...	244†	...	1,496	‡	‡	‡
1850	1,918	1,884	34	294	113***	...	181†	...	1,590	‡	‡	‡

*1920 data used also for 1925 ; 1930 data for 1935 ; and 1940 for 1945. Land and water areas were completely re-measured in 1940. The difference between the new measurements and those reported in earlier years is due primarily to the redetermination of the outer limits of the United States, the movement in mapping, and the fact that certain bodies of water included in previous measurements were omitted under the definitions adopted in 1940.

**More than half the forest and woodland in the United States is grazed by livestock. Nonfarm grazing land includes arid woodland and other noncommercial-forest land.

***Improved farm land.

†Unimproved farm land.

‡Not available.

Population and Land Use Table 5·1

Population and Cropland in the United States, 1850-1950

Year	Population*	Improved land†	Land available for crops ‡ (all cropland and plowable pasture)	All cropland **	
				Land used for crops, including fallow or idle	Per capita
1	2	3	4	5	6
	Million	Million acres	Million acres	Million acres	Acres
1850	23	113	N.A.	76 ^{###}	3·3
1860	31	163	N.A.	109 ^{###}	3·5
1870	39	189	N.A.	126 ^{###}	3·2
1880	50	285	N.A.	188	3·8
1890	63	358	N.A.	248	3·9
1900	76	414	N.A.	319	4·2
1910	92	478	N.A.	347	3·8
1920	106	503	N.A.	402	3·8
1925	114	517 ^{***}	505	391	3·4
1930	123	536 ^{***}	522	413	3·4
1935	127	529 ^{***}	514	415	3·3
1940	132	527 ^{***}	510	399	3·0
1945	139	531 ^{***}	512	403	2·9
1950	151	536 ^{***}	510	409	2·7

* Data on population for all years are from U. S. Bureau of the Census reports and releases.

† Improved land is all land regularly tilled or mowed, land in pasture which has been cleared or tilled, fallow land, land in orchards, gardens, vineyards, etc., and farmsteads. Data are from the census or are estimates based largely on census data. This classification was discontinued by the census after 1920.

‡ The land available for crops as reported by the Census of Agriculture 1925 to 1940 is the nearest comparable figure for that given for improved land. Land available for crops includes all cropland and plowable pasture. The land available for crops in 1945 is all cropland from census and national summaries of the Department of Agriculture.

** All cropland as defined here is all land used for crops, including cropland harvested, failure, and fallow or idle cropland. Cropland also may be defined as acreage actually used for crops, that is, cropland harvested, crop failure, and fallow land, exclusive of that classified as idle. Land actually idle, however, any one year seldom is more than 6 to 8 percent of the cropland area as given in this table. Land is left idle for a number of reasons, including the need for restoration of crop and pasture land by rotation and changes in use, and the desirability in some areas to have a small reserve acreage to prepare for crops in advance of the planting season. Some cropland remains idle because of wet weather, floods, or drought; lack of labour and machinery; or of opportunities for more profitable employment.

*** Estimated.

Population and Land Use Table 5.2

Acres harvested and yield per acre

(i) WHEAT

Year	Acreage harvested (1000 acres)	Production (1000 bushels)	Farm Value (1000 dollars)	Yield per acre (bushels)	Index number of prices*	Price (cents per bushel)
1	2	3	4	5	6	7
1866-75	21,918	270,595	337,186	12.3	122.3	124.6
1876-85	34,553	448,337	413,730	13.0	90.6	92.3
1886-95	38,496	526,076	356,288	13.7	66.4	67.7
1896-1900	47,258	630,354	413,935	13.3	64.5	65.7
1901-05	47,002	674,843	483,123	14.4	70.3	71.6
1906-10	45,105	664,299	579,992	14.7	85.7	87.3
1911-15	53,247	801,080	712,938	15.0	87.3	89.0
1916-20	59,485	790,773	1,526,204	13.3	189.4	193.0
1921-25	57,558	787,082	857,067	13.7	109.1	111.2
1926-30	60,300	866,870	883,173	14.4	100.0	101.9
1931-35	51,926	680,868	406,253	13.1	58.9	60.0
1936-40	57,706	797,307	614,151	13.8	77.0	78.4
1941-45	56,384	984,700	1,252,507	17.5	123.9	126.3
1946-50	70,530	1,198,869	2,426,184	17.0	197.6	201.4
1933	49,424	552,215	410,770	11.2	73.0	74.4
1934	43,347	526,052	446,085	12.1	83.2	84.8
1935	51,305	628,227	521,915	12.2	81.5	83.1
1936	49,125	629,880	645,465	12.8	100.6	102.5
1937	64,169	873,914	840,706	13.6	94.4	96.2
1938	69,197	919,913	516,636	13.3	55.2	56.2
1939	52,668	748,180	512,401	14.1	67.8	69.1
1940	53,273	814,646	555,547	15.3	66.9	68.2
1941	55,935	941,970	889,561	16.8	92.6	94.4
1942	49,773	969,381	1,064,789	19.5	107.9	110.0
1943	51,355	843,813	1,148,845	16.4	133.5	136.0
1944	59,749	1,060,111	1,497,693	17.7	138.4	141.0
1945	65,120	1,108,224	1,661,649	17.0	147.2	150.0
1946	67,075	1,153,046	2,203,246	17.2	187.4	191.0
1947	74,389	1,367,186	3,128,587	18.4	224.7	229.0
1948	73,017	1,313,534	2,614,439	18.0	195.3	199.0
1949	76,559	1,141,188	2,141,564	14.9	184.5	188.0
1950	61,610	1,019,389	2,043,082	16.5	196.3	200.0
1951 (Preliminary)	61,424	987,474	2,091,535	16.1	208.0	212.0

Source: (i) Table No. 707, page No. 650, Statistical Abstract of United States, 1952.

(ii) Table No. 741, page 615, Statistical Abstract of United States, 1952.

*With 1926-30 as base (100).

Population and Land Use Table 5·2—concl'd.

Acreage harvested and yield per acre

(ii) CORN

Year	Acreage harvested (1000 acres)	Production (1000 bushels)	Farm Value (1000 dollars)	Yield per acre (bushels)	Index number of prices*	Price (cents per bushel)
1	2	3	4	5	6	7
1866—75	40,123	1,028,963	561,163	25·6	70·6	54·5
1876—85	63,655	1,667,510	652,608	26·2	50·6	39·1
1886—95	78,327	1,986,608	725,562	25·4	47·3	36·5
1896—1900	91,243	2,523,555	711,706	27·7	36·5	28·2
1901—05	95,226	2,529,114	1,113,625	26·6	57·0	44·0
1906—10	97,894	2,735,480	1,450,885	27·9	68·8	53·1
1911—15	100,294	2,609,562	1,720,900	26·0	85·5	66·0
1916—20	102,631	2,704,768	3,342,953	26·4	159·8	123·4
1921—25	101,275	2,706,506	2,033,203	26·7	97·5	75·3
1926—30	99,483	2,484,935	1,919,033	25·0	100·0	77·2
1931—35	102,306	2,330,431	1,137,535	22·8	63·2	48·8
1936—40	90,790	2,347,096	1,432,749	25·9	83·8	64·7
1941—45	89,375	2,931,095	3,031,463	32·8	133·4	103·0
1946—50	85,467	3,150,590	4,779,346	36·9	202·1	156·0
1933	105,918	2,397,593	1,246,777	22·6	67·4	52·0
1934	92,193	1,448,920	1,181,479	15·7	105·6	81·5
1935	95,974	2,299,363	1,506,281	24·0	84·8	65·5
1936	93,154	1,505,689	1,571,859	16·2	135·2	104·4
1937	93,930	2,642,978	1,368,474	28·1	67·1	51·8
1938	92,160	2,548,753	1,239,619	27·7	63·0	48·6
1939	88,279	2,580,912	1,465,075	29·2	73·6	56·8
1940	86,429	2,457,146	1,518,719	28·4	80·1	61·8
1941	85,357	2,651,889	1,991,103	31·1	97·3	75·1
1942	87,367	3,068,562	2,813,772	35·1	118·8	91·7
1943	92,060	2,965,980	3,328,496	32·2	145·1	112·0
1944	94,014	3,088,110	3,353,386	32·8	141·2	109·0
1945	88,079	2,880,933	3,670,567	32·7	164·5	127·0
1946	88,489	3,249,950	5,081,927	36·7	202·1	156·0
1947	83,932	2,383,970	5,145,345	23·4	279·8	216·0
1948	86,067	3,681,793	4,778,843	42·8	168·4	130·0
1949	87,029	3,379,436	4,211,005	38·8	161·9	125·0
1950	81,817	3,057,803	4,679,612	37·4	198·2	153·0
1951 (Preliminary)	81,306	2,941,423	4,934,921	36·2	217·6	168·0

Source: (i) Table No. 707, page No. 650, Statistical Abstract of United States, 1952.

(ii) Table No. 741, page 615, Statistical Abstract of United States, 1952.

*With 1926-30 as base (100).

Population and Land Use Table 5.3

Exports and Imports: 1852 to 1951

(i) WHEAT:

(Pounds per bushel of wheat, 60; per barrel of wheat flour, 196)

Yearly average or year ending June 30	Exports (excl. Re-exports)				Imports— wheat and flour
	Wheat (grain)	Wheat flour	Wheat and flour		
	1	2	3	4		5
	1,000 bushels	1,000 barrels	1,000 bushels	1,000 bushels	
1852—1856	4,715	2,892	19,173	4,178	
1857—1861	12,378	3,318	28,970	6,979	
1862—1866	22,530	3,531	40,184	4,728	
1867—1871	22,107	2,585	35,032	1,818	
1872—1876	48,958	3,416	66,037	1,680	
1877—1881	107,781	5,376	133,263	906	
1882—1886	82,884	8,620	121,675	517	
1887—1891	64,739	11,287	115,529	352	
1892—1896	99,914	15,713	170,624	1,634	
1897—1901	120,247	17,151	197,427	1,280	
1902—1906	70,527	15,444	140,026	993	
1907—1911	62,855	11,841	116,138	706	
1912—1916	129,415	13,185	188,748	2,996	
1917—1921	155,646	19,167	241,899	26,064	
1922—1926	140,149	14,274	207,237	17,473	
1927—1931	114,781	12,763	174,766	16,491	
1932—1936	27,908	4,763	50,295	21,106	
1937—1941	41,189	5,679	67,879	16,512	
1932	96,521	8,357	135,799	12,886	
1933	20,887	4,324	41,211	9,380	
1934	18,800	3,873	37,002	11,494	
1935	3,019	3,939	21,532	25,134	
1936	311	3,323	15,929	46,638	
1937	3,168	3,918	21,584	47,924	
1938	83,740	4,990	107,194	3,561	
1939	84,589	6,637	115,784	9,623	
1940	23,636	6,519	54,274	10,430	
1941	10,810	6,329	40,557	11,024	
1942	12,632	4,986	36,064	15,576	
1943	6,555	5,712	33,401	8,752	
1944	11,942	8,342	51,149	147,255	
1945	19,010	8,255	57,811	51,561	
1946	226,135	20,717	323,506	13,624	
1947	144,029	36,313	314,702	2,041	
1948	N.A.	N.A.	479,752	N.A.	
1949	N.A.	N.A.	505,303	N.A.	
1950	N.A.	N.A.	314,231	N.A.	
1951	N.A.	N.A.	373,810	N.A.	
1942—46	55,255	9,602	100,386	47,354	
1947—51	...	...	397,560	...

Source: Statistical Abstract of the United States, 1948 and 1952.

Exports and Imports : 1852 to 1951
(ii) CORN
(Corn in thousands of bushels of 56 pounds)

<i>Yearly average or year ending June 30—</i>	<i>Corn</i>	
	<i>Exports*</i>	<i>Imports</i>
1	2	3
1852—1856	7,123	...
1857—1861	6,558	48
1862—1866	12,060	56
1867—1871	9,924	75
1872—1876	38,561	57
1877—1881	88,190	41
1882—1886	49,992	24
1887—1891	54,606	15
1892—1896	63,980	8
1897—1901	192,531	4
1902—1906	74,615	28
1907—1911	56,568	92
1912—1916	38,774	5,688
1917—1921	45,296	4,959
1922—1926	66,759	1,141
1927—1931	18,941	1,855
1932—1936	4,170	10,509
1937—1941	45,726	23,018
1942	20,221	610
1943	9,062	498
1944	10,929	156
1945	15,769	9,606
1946	13,601	411
1947	76,029	634
1948	33,695	..
1949	90,621	N.A.
1950	109,670	N.A.
1951	116,030	N.A.

Source : Statistical Abstract of the United States
1948 and 1952.

*Exports include meal in terms of grain.

Population and Land Use Table 5·4
Production, Consumption, Exports, Imports, Prices, and Carry-Over: 1905 to 1951

(i) COTTON

[ALL FIGURES EXCEPT NET WEIGHT AND PRICE, IN THOUSANDS OF BALES]

Year ending July 31	Cotton (Exclusive of Linterns)							
	Production		Average net weight of bale (lbs.)	Average price per pound of upland cotton (cents.)	Consumption (running bales)	Exports of domestic cotton (running bales)	Imports (equivalent 500-pound bales)	Carry-over (running bales)
	Running bales, counting round as half bales	Equivalent 500-pound gross weight						
1	2	3	4	5	6	7	8	9
1905	13,451	13,438	478	8·7	4,279	8,560	130	1,935
1906	10,495	10,575	482	10·9	4,909	6,906	133	1,349
1907	12,983	13,274	489	10·0	4,985	8,616	203	1,515
1908	11,058	11,107	480	11·5	4,539	7,465	141	1,236
1909	13,086	13,242	484	9·2	5,092	8,635	165	1,484
1910	10,073	10,005	475	14·3	4,622	6,206	151	1,040
1911	11,568	11,609	480	14·0	4,498	7,788	231	1,375
1912	15,553	15,693	483	9·6	5,129	10,719	229	1,777
1913	13,489	13,703	486	11·5	5,483	8,746	225	1,598
1914	13,983	14,156	484	12·5	5,577	9,151	266	1,448
1915	15,906	16,135	485	7·3	5,597	8,323	364	3,936
1916	11,068	11,192	484	11·2	6,398	5,896	421	3,140
1917	11,364	11,450	482	17·3	6,789	5,300	288	2,720
1918	11,248	11,302	480	27·1	6,566	4,288	217	3,450
1919	11,906	12,041	484	28·8	5,766	5,592	197	4,287
1920	11,326	11,421	482	35·4	6,420	6,545	683	3,563
1921	13,271	13,440	484	15·8	4,893	5,745	211	6,534
1922	7,978	7,954	476	16·9	5,910	6,184	352	2,832
1923	9,729	9,762	480	22·9	6,666	4,823	450	2,325
1924	10,171	10,140	477	28·7	5,681	5,656	272	1,556
1925	13,639	13,628	478	22·9	6,193	8,005	303	1,610
1926	16,123	16,104	478	19·6	6,456	8,051	314	3,543
1927	17,755	17,977	484	12·5	7,190	10,927	382	3,762
1928	12,783	12,956	485	20·2	6,834	7,542	321	2,536
1929	14,297	14,478	484	18·0	7,091	8,044	442	2,312
1930	14,548	14,825	487	16·8	6,106	6,690	368	4,530
1931	13,756	13,932	484	9·5	5,263	6,760	99	6,370
1932	16,629	17,096	492	5·7	4,866	8,708	107	9,678
1933	12,710	13,002	490	6·5	6,137	8,849	124	8,165
1934	12,664	13,047	493	10·3	5,700	7,534	141	7,744
1935	9,472	9,637	487	12·4	5,361	4,799	106	7,208
1936	10,420	10,638	488	11·1	6,351	5,973	152	5,409
1937	12,141	12,399	489	12·3	7,950	5,440	249	4,499
1938	18,252	18,945	497	8·4	5,748	5,598	158	11,533
1939	11,623	11,944	492	8·6	6,858	3,327	132	13,033
1940	11,481	11,816	493	9·1	7,784	6,192	162	10,564
1941	12,298	12,565	489	9·9	9,722	1,112	188	12,166
1942	10,495	10,742	491	17·0	11,170	1,125	252	10,640
1943	12,438	12,820	495	19·0	11,100	1,480	168	10,657
1944	11,129	11,429	493	19·9	9,943	1,138	129	10,744
1945	11,839	12,230	496	20·7	9,568	2,009	190	11,164
1946	8,813	9,016	491	22·5	9,163	3,613	343	7,326
1947	8,517	8,639	507	32·6	10,025	3,545	284	2,530
1948						1,970		
1949	N.A.	N.A.	N.A.	N.A.	N.A.	4,747	N.A.	N.A.
1950	N.A.	N.A.	N.A.	N.A.	N.A.	5,770	N.A.	N.A.
1951	N.A.	N.A.	N.A.	N.A.	N.A.	4,117	N.A.	N.A.

Source: Statistical Abstract of the United States 1948

Population and Land Use Table 5:5
Fertilizer Consumption : 1850 to 1950

<i>Commercial Fertilizer</i>						
<i>Year</i>	<i>Nutrients contained</i>				<i>Farmers' expenditures for fertilizer and lime</i>	<i>Lime consumed on farms</i>
	<i>Consumed in United States @</i>	<i>Nitrogen (N)</i>	<i>Phosphoric acid (P₂O₅)</i>	<i>Potash (K₂O)</i>		
	1000 Short Tons	1000 Short Tons	1000 Short Tons	1000 Short Tons		
1	2	3	4	5	6 <i>Million Dollars</i>	7 <i>1000 Short Tons</i>
1950	N.A.	N.A.	N.A.	N.A.	821	26,536
1949	17,927	911	1,884	1,064	784	26,301
1948	17,596	841	1,843	956	717	24,811
1947	17,397	836	1,775	879	685	29,834
1946	16,087	756	1,671	852	620	28,932
1945	*13,981	*679	*1,438	*746	508	23,023
1944	13,330	640	1,408	649	476	24,557
1943	11,734	509	1,237	643	423	18,935
1942	10,331	409	1,131	547	352	19,838
1941	9,607	458	994	467	292	15,916
1940	8,656	419	912	435	261	14,406
1939	7,993	398	789	409	240	9,066
1938	7,758	384	744	393	226	7,859
1937	8,433	412	794	416	248	7,199
1936	7,222	350	673	350	196	6,566
1935	6,534	312	597	307	177	3,505
1934	5,794	275	530	263	158	2,748
1933	5,110	240	464	222	128	1,548
1932	4,545	214	413	192	125	1,811
1931	6,541	301	611	275	202	2,611
1930	8,425	377	793	354	288	3,588
1929	8,208	352	774	338	293	3,907
1928	8,215	342	776	333	292	3,806
1927	7,074	282	667	268	230	3,798
1926	7,531	286	701	290	250	3,330
1925	7,503	279	680	283	250	3,359
1924	6,999	252	630	259	231	3,217
1923	6,571	230	591	237	230	3,076
1922	5,798	191	516	226	212	2,935
1921	4,977	159	443	189	221	2,794
1920	7,296	228	660	258	382	2,653
1919	6,751	219	641	88	347	2,476
1918	6,580	217	625	46	317	2,306
1917	6,087	213	596	33	236	2,136
1916	5,214	208	505	16	179	1,966

*First revision. Still subject to minor revision.

Population and Land Use Table 5·5 (concl'd.)

· Fertilizer Consumption : 1850 to 1950

Year	Commercial Fertilizer					
	Nutrients contained				Farmers' expenditures for fertilizer and lime	Lime consumed on farms
	Consumed in United States @	Nitrogen (N)	Phosphoric acid (P ₂ O ₅)	Potash (K ₂ O)		
	1,000 Short Tons	1,000 Short Tons	1,000 Short Tons	1,000 Short Tons	Million Dollars	1,000 Short Tons
1	2	3	4	5	6	7
1915	5,418	206	515	81	172	1,796
1914	7,194	216	662	237	208	1,626
1913	6,416	173	571	244	182	1,456
1912	5,852	157	521	222	161	1,286
1911	6,108	162	544	232	166	1,116
1910	5,547	146	499	211	149	946
1909	4,821	125	434	178	120	776
1908	4,449	107	400	160	...	...
1907	4,307	101	392	151	...	...
1906	4,249	99	391	144	...	...
1905	3,913	90	368	129	...	...
1904	3,704	84	344	122	...	...
1903	3,382	77	311	108	...	...
1902	3,084	70	284	96	...	...
1901	3,044	68	282	90	...	...
1900	2,730	62	246	86	...	...
1899	2,603	60	236	82	...	...
1898	2,333	55	212	71	...	...
1897	2,131	51	195	63	...	...
1896	1,888	50	174	54	...	...
1895	1,578	39	147	42	...	...
1894	1,773	45	165	45	...	...
1893	1,715	45	160	42	...	...
1892	1,504	40	141	35	...	...
1891	1,584	43	150	36	...	...
1890	1,390	38	132	31	...	...
1880	753	19	70	13	...	...
1870	321	14	31	4	...	...
1860	164	10	12	3	...	...
1850	53	3	4	1	...	...

NOTE:—@Includes Hawaii and Puerto Rico. Also fertilizers distributed by Government agencies.

Source up to 1945: Series E 105-116, Historical Statistics of United States 1789-1945.

1946-1950. Statistical Abstract of U. S., Appendix 1 for 1952, 1951 and 1950.

Population and Land Use Table 6·0 to 6·2

Population, Land Utilization and Food Production in the U.S.S.R

(By Dr, Nath, M.A., Ph.D., of the Planning Commission)

Tables 6·0 to 6·2 show the trends in population, sown area, production and exports of food-grains in the Soviet Union during the period 1913 to 1939. The figures of these tables have been compiled mainly from the following two sources :—

S. P. Turin : "The U.S.S.R.", London, 1944.

Alexander Baykov : "The Development of the Soviet Economic System" Cambridge, 1946.

The 25 year period covered by these tables is the period during which revolutionary changes occurred in the political and economic life of the Soviet Union. This is the period of World-War I, the Bolshevik Revolution of 1917, the Civil War and the disturbances following the revolution (which led to an almost complete disruption of the country's economic life), the New Economic Policy and the First and the Second Five Year Plans. At the beginning of the period, Russia was still under the Czarist Regime. By its end, the conflicts, disturbances and difficulties following the Bolshevik Revolution has been largely overcome and the country had completed a decade of economic development under the two Five-year Plans.

Population :

The population of Soviet Union, which had been growing rapidly during the 19th Century, was estimated at about 139 million by 1914. During the next decade there were very large losses of life : first, due to World-War I, and then as a result of the Civil War and other post-Revolution disturbances, and the famines and scarcities of the early twenties. In 1923, the population was estimated at 137 million or somewhat less than the population of a decade ago. After 1923, however, population has been steadily

increasing. Between 1926 and 1939 i.e., between the 2nd and 3rd General Censuses, the Soviet Union's population increased from 147 to 170·5 million. This is an increase of 23·5 million in 13 years, which works out to a mean annual rate of increase of a little over 1·1 per cent.

Total area sown:

In 1913, the total area sown was 105·0 million hectares. With population at about 139 million, sown-area *per capita* came to 0·75 hectares or 1·85 acres. In 1922, sown area totalled only 77·7 million hectares or less than 3/4s of the 1913 total. This figure of sown-area, as also the figures of grain acreage and production in table 1·2 reflect the sharp decline in agricultural production in the years following the 1917 Revolution. First, the Civil War, and then the various economic policies followed by the new regime and the conflicts between the Government and certain classes of people led to an almost complete break-down of the country's economy, -during these years. The decline in agricultural production was accentuated also by the peasants' vehement opposition to the Government's measures for securing grain and other agricultural surplus for the urban and industrial areas. With the beginning of the New Economic Policy in 1923, however, production began to increase again. By 1930, when the First Five-Year Plan (launched in 1928) had been in operation for two years, sown-area totalled 127 million hectares, and by 1931 it increased - to 136 million hectares. The 1931 figure was nearly 60 million hectares more than the figure of 1922 and 31 million hectares more than the figure of 1913. This increase in sown area was achieved mainly by extension of cultivation in the dry lands of the Lower Volga region, in Siberia and in Soviet Central Asia. After 1931, however, there was practically no increase in sown-area. The figures show minor fluctuations from year to year caused mainly by seasonal factors.

Side by side with this expansion in cultivation, there also occurred a marked change in the cropping pattern. In 1913, nearly 9/10th of the sown area was given to the production of food grains. Commercial crops like cotton, sugar-beets, flax, tobacco, sun-flower etc. (called technical crops in Soviet statistics) occupied a total of

4.6 million hectares; potatoes and vegetables occupied about 4 million hectares, and fodder crops about 2 million hectares. By 1930, the proportion of sown-area occupied by foodgrains had been reduced to about 75% and that under technical crops, potatoes and vegetables and fodder crops had been greatly increased. Between 1913 and 1930, whereas the area under foodgrains increased from 94.4 to 101.8 million hectares, or less than 7%, the area under technical crops increased from 4.6 million to 10.5 million hectares or nearly 2½ times. This emphasis towards increasing production of commercial crops, potatoes and vegetables, and fodder crops was due to the Soviet Government's policy of diversifying agriculture, promoting development of subsidiary agricultural occupations like livestock farming, and increasing production of agricultural raw materials like cotton for the expanding manufacturing industries.

Table 6.1 shows the acreage, production and yields per acre of foodgrains. It will be seen from this table that production of foodgrains, which totalled 800 million quintals in 1913, went down to about 500 million quintals by 1922. After this date, however, there was a steady increase in production and by 1930 production stood at 835 million quintals. During the 1930's production fluctuated between 700 and 950 million quintals, except in 1937, which was an exceptionally good year and in which production exceeded 1100 million quintals. Broadly speaking, therefore, grain production in the 1930's was practically at about the same level as in 1913.

Column 4 in this table gives the yields per acre of foodgrains. In 1913, average yield of foodgrains was 8.5 quintals per hectare. In the 1930's yields fluctuated from 6.7 quintals in 1931 to 11.5 quintals in 1937, the average for the 9 year period 1930-38 being 8.5 quintals per hectare. Thus the yield per acre of foodgrains in the 1930's was also practically the same level as in 1913. This is very significant in view of the fact that between 1913 and the 1930's the agricultural system had been completely revolution-

ized, both as regards its organisation and its techniques of production. In 1913, land was held in small peasant operated farms or in large estates, the farming methods were generally backward and machinery was little used. By the 1930's all this had been completely changed. Collectivisation of agriculture had proceeded to the stage at which most of the farm land was in collective farms, and large areas were in State farms. Machinery was used on an extensive scale and the latest scientific knowledge was being applied to agriculture.

Table 6.2 shows the exports of the principal foodgrains, wheat, barley and rye. Russia was, in the years before World War I, noted for its large exports of foodgrains. In 1913, the total exports of these three grains amounted to nearly 8 million tons, or about 1/5 of the country's total grain production. This figure of 8 million tons has never been reached again. During the 1930's, the exports were rather small, the maximum, 2 million tons being in 1938. This, it may be noted, followed the record crop of 1937.

The main reason for the lower exports in the 1930's seems to be increase in domestic demand caused by increase in population in general and in urban population in particular, without any increase in grain production. By 1939, whereas the total population was nearly 32 million (or 22%) above the 1913 figure, grain production was practically at the same level as in 1913.

The changes in production and exports of crops in the Soviet Union may be summarised as follows: Before World War I, Soviet agriculture was a grain crop agriculture, and produced a large grain surplus for export. By the 1930's, agriculture had become much more diversified. Production of technical crops like cotton, sugar beet, flax etc. potatoes and vegetables and livestock products had been greatly increased. The production of foodgrains was still at about the same level as in the pre-war years, but as the domestic demand was much greater, the exportable surplus had been greatly reduced.

Table 6·0
Population and area sown by crops —U. S. S. R.

Year	Population million	Total area sown	Total area under			
			Grain crops	Technical crops	Potatoes and vegetables	Fodder crops
I	2	3	4	5	6	7
1913	139*	105·0	94·4	4·6	3·8	2·0
1922	137†	77·7	66·2	4·0	...	...
1930	147§	127·2	101·8	10·5	...	...
1931 . . . . .	...	136·3	104·4	14·0	...	...
1932 . . . . .	...	134·4	99·7	14·9	...	...
1933 . . . . .	...	129·7	101·5	12·0	...	...
1934 . . . . .	...	131·4	104·7	10·7	...	...
1935 . . . . .	...	132·8	103·4	10·6	...	...
1936 . . . . .	...	133·8	102·4	10·8	...	...
1937 . . . . .	...	135·3	104·4	11·2	...	...
1938 . . . . .	...	136·9	102·4	11·0	...	...
1939	170·5‡	134·0	99·6	11·1	14·0	9·2

NOTE:—All areas are in millions of hectares (1 hectare=2·47¹/₂ acres).

*1914 estimates

†1923 estimates

§ 1926, 2nd General Census

‡ 1933, 3rd General Census

Table 6·1
Areas and Yields—U. S. S. R.

Year	<i>Area under grain (in millions of Hectares 1 Hectare=2·47 acres)</i>	<i>Yield of grain (millions of Quintals 1 Quintal=112 lbs.)</i>	<i>Average yield rate (in Quintals per Hectare)</i>
1	2	3	4
1913	94·4	801·0	8·5
1922	66·2	503·1	7·6
1926	93·7	768·3	8·2
1927	94·7	723·6	7·6
1928	92·2	733·2	8·0
1929	96·0	717·4	7·5
1930	101·8	835·5	8·2
1931	104·4	694·8	6·7
1932	99·7	698·7	7·0
1933	101·5	898·0	8·8
1934	104·7	894·0	8·5
1935	103·4	901·0	8·7
1936	102·4	827·3	8·1
1937	104·4	1202·9	11·5
1938	102·4	949·9	9·3

Table—6.2
Foodgrain Exports—U.S.S.R.

<i>Year</i>	<i>Exports in Millions of Tons</i>			
	<i>Wheat</i>	<i>Barley</i>	<i>Rye</i>	<i>Total</i>
1	2	3	4	5
1913 .	3.33	3.93	0.65	7.91
1930 . .	2.53	1.18	0.65	4.36
1931 . .	2.50	0.97	1.10	4.57
1932 . .	0.55	0.42	0.42	1.39
1933 . .	0.75	0.57	0.16	1.48
1934 . .	0.21	0.18	0.10	0.49
1935 . .	0.72	0.59	0.04	1.35
1936 . .	0.06	0.11	0.11	0.28
1937 . .	0.85	0.22	0.20	1.27
1938 . .	1.28	0.41	0.36	2.05

APPENDIX II
BIRTH RATES AND DEATH RATES

Birth Rates and Death Rates

I — *The nature and purpose of this study*

IT IS NECESSARY that the census data about the growth of population should be analysed and the main component elements of the growth of population *viz.*, birth, death and migration separated from one another. To this end, it is necessary to assemble all available data about registration of births and deaths, correlate them to census data, and scrutinise them critically. The collection of data was initiated and the lines of study prescribed in a circular letter issued to all Superintendents of Census Operations on 7th May 1951. This study has been completed with the help of all Superintendents of Census Operations and Shri S. P. JAIN, the Census Actuary. The results are set out in this note.

2. For purposes of this study a change was made in the yard-stick for the measurement of growth of population. In earlier censuses, growth of population used to be measured by 'percentage variation' which expressed the difference between the numbers at the beginning and end of a period as a percentage of the population at the beginning of the period. At this census, the rate of growth is measured by the 'growth rate' which differs from the 'percentage variation' in that, the difference between the numbers at the beginning and end of a period is expressed as a percentage of the arithmetical mean of the population at the beginning and the end of the period. The difference is small; nevertheless, it is worth making. It helps us easily to institute comparison between periods of unequal duration. Even more important, it helps us easily to relate the growth rate to the birth rate and the death rate.

3. The growth during any period is made up of two parts. One is the natural increase and the

other is the net migration. Natural increase in its turn is the excess of births over deaths. If these are expressed as percentages of the mean population during the period under consideration, the growth rate is seen to be the sum of the natural increase rate and the net migration rate. And the natural increase rate is the excess of the birth rate over the death rate. As registration of births and deaths is non-existent in some parts of the country and incomplete in varying degrees in all parts of the country, a clear distinction has to be made between the registered birth rate and the actual birth rate; between the registered death rate and the actual death rate; and, consequently between the registered rate of natural increase and the actual rate of natural increase. The difference between mean decennial growth rate and the mean decennial rate of natural increase ascertained from the registration data will, therefore, not be identical with the mean decennial rate of net migration. There will be a further difference attributable mainly to the incompleteness of registration of births and deaths, and partly also to differential errors (if any) in enumeration at successive censuses. Let us refer to this combined difference as net-migration-cum-statistical error. We have then the formula: Census Growth Rate-Registered Birth Rate minus Registered Death Rate plus Net Migration-cum-Statistical Error. This is the starting point for collection, analysis and review of all relevant data.

4. All the Superintendents of Census Operations have prepared Subsidiary Tables which are designed to exhibit the relation between the census figures of growth of population and the registration figures of births and deaths in accordance with this formula. Basic data have been

compiled for three decades 1941-50, 1931-40 and 1921-30 under the following heads :

1. Mean population of the decade;
2. Mean population of the decade for area under registration of births and deaths;
3. Growth of population during decade;
4. Mean decennial growth rate;
5. Registered births during decade;
6. Mean decennial birth rate (registered);
7. Registered deaths during decade;
8. Mean decennial death rate (registered);
9. Decennial rate of natural increase (registered);
10. Migration-cum-Statistical error.

The data furnished by the Superintendents of Census Operations have been compiled, and a table prepared, showing the figures for India, states, divisions, zones, regions and sub-regions. The table is printed as *Annexure I* at the end of this APPENDIX.

5. Nature and extent of birth/death registration data— It has been mentioned in paragraph 3 that the registration of births is non-existent in some parts of the country and incomplete in varying degrees in all parts of the country. With reference to the degree of completeness and efficiency of registration, the entire territory of each zone has been divided into the following four categories :

A— Areas for which birth/death registration data are available for all the three decades 1921-30 to 1941-50 and where omissions are not unduly large and the registration may, therefore, be regarded as being reasonably satisfactory. These are : Madras, Coorg, Bombay, Madhya Pradesh, Punjab, Ajmer-Merwara and Delhi, subject to the exception of 'merged' areas within these States.

B— Areas for which birth/death registration are available for all the three decades 1921-30 to 1941-50 but where registration cannot be regarded as being reasonably satisfactory. These are : Uttar Pradesh, Bihar, Orissa, West

Bengal, Assam Plains and Mysore, subject to the exception of 'merged' areas within these States.

C— Areas for which birth/death registration data are available for 1941-50, but not for the previous decades. [In these cases also the registration cannot be regarded as being reasonably satisfactory.] These are: Hyderabad, Travancore-Cochin and Himachal Pradesh.

D— Areas for which birth/death registration data are not available at all. These are : Assam Hills, Manipur, Tripura, Sikkim, Saurashtra, Kutch, Madhya Bharat, Bhopal, Vindhya Pradesh, Rajasthan, PEPSU, Bilaspur, Jammu-Kashmir and 'merged' areas in other states.

TABLE I shows the relative magnitude of the different categories of areas in India and the zones, the magnitude being expressed as a percentage of the mean population of the areas in question to the total population during the decade 1941-50.

TABLE I

Zone	A	B	C	D
North India . . .	97.7	...	...	2.3
East India . . .	88.6	...	...	11.4
South India . . .	76.1	11.9	12.0	...
West India . . .	60.4	...	...	39.6
Central India . . .	35.0	...	35.1	29.9
North-West India . . .	40.5	...	3.5	56.0
INDIA . . .	31.5	42.9	8.0	17.6

6. It will be seen from *Annexure I* that the table excludes not only areas of Category *D*,

but also Hyderabad whose figures were rejected as too defective to be worth compiling. Figures are furnished for the other areas of Category C (Travancore-Cochin and Himachal Pradesh), but

they have not been included in the totals for India and the zones. These totals (which are limited to areas of Categories A and B) are reproduced in TABLE 2 below :

TABLE 2

Zone	Mean decennial growth rate (Census)			Mean decennial growth rate (Census)—Areas of Categories A & B			Mean decennial birth rate (Registered)—Areas of Categories A & B			Mean decennial death rate (Registered)—Areas of Categories A & B		
	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30
1	2	3	4	5	6	7	8	9	10	11	12	13
INDIA	12.5	13.3	10.4	12.4	13.0	9.6	27.2	33.8	33.7	19.4	23.0	25.3
North India	11.2	12.7	6.5	11.2	12.8	6.5	24.8	34.2	34.0	16.5	21.9	25.6
East India	10.8	14.4	10.8	10.8	14.3	10.4	21.7	29.8	32.5	17.5	21.7	25.3
South India	15.3	11.7	10.9	14.5	11.0	9.4	28.8	32.8	30.1	19.4	21.3	21.3
West India	20.1	14.6	12.3	20.8	14.5	12.1	32.9	37.2	35.9	22.6	25.1	26.7
Central India	10.0	11.3	12.4	7.2	9.3	10.9	37.0	41.2	41.4	30.3	31.9	31.8
North-West India	9.0	16.7	11.2	6.0	17.5	10.6	38.2	42.5	40.3	23.0	26.3	30.3

7. The registration areas of Categories A & B (it will be seen from TABLE 1) account for nearly three quarters of the population of India. The census growth rates of these areas differ—but only very slightly—from those of the country as a whole. According to TABLE 2, registered births and registered deaths during 1941-50 were as follows.

For every 1,000 persons living in these areas during the decade, 272 persons were registered as born during the decade; 194 persons were registered as having died during the decade. Thus 78 persons are shown to have been added to the population during the decade. But the census figures show that the addition was 124 in these same registered areas. The difference of 46 must be attributable to unregistered births; unregistered deaths; net migration; and the difference (if any) between the 1941 Census and the 1951 Census as regards accuracy of enumeration. Is it possible, even approximately, to assess how much of each it is, and to frame estimates of the actual numbers of births and deaths per 1,000 persons of mean population during the decade? This question may be put about India, as well as each of the six zones. The smaller the area about which the question is put, the more difficult it is to answer it. *The primary purpose of the present study is to furnish*

answers to these questions and thus to frame the best possible estimates of 'mean decennial birth rates' and 'mean decennial death rates' during the decade 1941-50 for India and each of its six zones.

8. Supposing we do succeed in solving this problem, then we pass on to a second set of questions. According to TABLE 2, the registered birth rate was practically stationary between 1921-30 and 1931-40 (33.7 and 33.8) but fell sharply (to 27.2) during 1941-50. Is that a real fall in actual births, or only a fall in the registration of births? Or is it a little of both; and, if so, how much of each?

Similar questions may be put about the death rates. These questions may be put not only about India but also about the zones.

If we succeed in answering these questions, the next step would be to attempt to ascertain whether, and if so, why, the rates of one zone differ from those of another; and also the causes which have led to changes in these rates from one decade to another. It is not intended that these further questions should be finally answered in this note. But they indicate why it is so important that the very set of questions—those set out in para 7 above—should be answered with as much certainty as possible.

9. The following materials have been collected and used in an endeavour to answer these questions :

A—Material furnished by the Superintendents of Census operations in States :

- (i) Census statistics of birth-place;
- (ii) Census facts about migration of displaced persons;
- (iii) Other facts locally known and thereby throwing light on the direction and volume of net migration;
- (iv) Results of the Experimental Census of Sample Households, 1952 and locally held sample surveys to secure an estimate of the extent of under-registration in births and deaths and thus compute the annual birth and death rates;

(v) Superintendent's analysis of the census data bearing on the birth rates and death rates; and

(vi) Computation of birth rates and death rates in relation to earlier census data made by Superintendents of census operations.

B. Birth rates and death rates calculated by Mr. S. P. JAIN, the 1951 Census Actuary.

C—Expected birth rates by operation of maternity rates derived from the maternity data of the 1951 Census.

The nature of the light thrown by each of these three different types of material is explained successively in Sections III, IV and V. A combined final review is presented in Section VI. Before proceeding to examine these data, it is necessary to consider the basic figures of the total count of population at successive censuses, and determine whether any allowance should be made for error present in them.

II—Allowance for error in Census figures

10. The first Indian Census took place in 1872, but the first of the systematic decennial series of censuses took place in 1881. The area covered by enumeration increased from decade to decade. The efficiency of enumeration also increased. The 1911 Census marked a definitive stage—when the technique of enumeration had been practically perfected and the census covered practically the whole area. This does not, of course, mean that no one was missed and everyone was enumerated without exception. Nor does it mean that fairly important changes in enumeration procedure did not take place later. They did. But the census of 1911 is, nevertheless, a landmark in that the proportion of the number omitted to the number counted had been reduced substantially and a high standard of completeness of enumeration attained; and (subject to certain special considerations set out below) the censuses, which were taken subsequently in 1921, 1931, 1941 and 1951 have maintained substantially the same standard so far as the degree of completeness of the count was concerned. The special considerations referred to above are explained below.

11. 'Merged Areas'—It is likely that in some of the numerous small States which are

since merged (*e.g.*, in such states as Madhya Pradesh) the present standard of completeness of enumeration was reached somewhat later. Even in such areas, however the technique was perfected by 1931 and the areas where the census count was significantly incomplete thereafter must be regarded as negligible from an all-India and zonal point of view.

12. The 1921 Census—This census was taken immediately after the influenza epidemic of 1918-19. In some areas where the epidemic was exceptionally severe, some increase in omission is probable.

There was also some difficulty arising out of the 'non-cooperation movement' which does not, however, appear to have developed into a boycott sanctioned by the leaders of the movement. The actual extent to which the census might have been affected in particular areas cannot now be measured. The references to the subject in the old reports indicate that we may safely assume that, while the 1921 Census figures might perhaps have been on the low side here and there the deficiency was not significant at the all-India and zonal levels.

13. **The 1931 Census**—This census coincided with the second wave of the non-cooperation movement, and this time there was a definite attempt at a boycott. The reports, however, indicate that census enumeration was actually impeded only in small and clearly located parts of West India. There may have been less significant effects of a purely local nature elsewhere also. The net result was much the same as in 1921 for India and the zones. No significant adjustments are necessary for purposes of computing the actual growth rates for these very large units.

14. **The 1941 Census**—The position was different in 1941, when the Census encountered difficulties of exactly the opposite nature to those of 1931. In parts of Bengal and the Punjab, there was a definite move among quite considerable numbers of Hindus as well as Muslims to make false returns in order to inflate the real numbers. The census authorities were aware of this and took whatever steps lay in their power to counter the move and furnish correct figures. Notwithstanding the steps thus taken, it seems likely that the published figures include an element of net over-enumeration. An attempt has, therefore, been made to assess its probable magnitude :

(a) An estimate of inflation was made by Mr. JAIN, the Census Actuary, and the Superintendent of Census Operations, Punjab. They have based their calculations in part on a statistical study of prior growth, and in part on the totals of a house-list prepared sometime before the competition between communities became a live issue. These calculations

indicate the presence of over-enumeration of the order of 2 or 3 lakhs in that part of the old Punjab Province which is now in India. [The Pakistan Census authorities have assessed the over-enumeration in that part of the Punjab which is now in Pakistan at about 9 or 10 lakhs.]

(b) A similar estimate was also made for West Bengal. Both the Census Actuary and the Superintendent of Census Operations, West Bengal concur in assessing this over-enumeration as being of the order of 17 lakhs. [The corresponding figure reached by Pakistan Census authorities in respect of East Bengal is 37 lakhs.] Having regard to the relative differences in the size of population, all these estimates appear to be reasonably consistent with one another. They are, therefore, accepted.

15. The net result of the special considerations set out in paras. 11 to 14 above may be stated as follows: *The differences between the population total of successive Censuses since 1911 may be accepted* as correctly representing the actual growth of population during successive decades for India and the zones, subject only to one correction on account of net over-enumeration during the 1941 Census. The actual growth during 1931-40 was smaller by about 20 lakhs than the Census figures indicate. Correspondingly, the actual growth during 1941-50 was larger by about 20 lakhs than the census figures indicate.* The figures of columns 2 and 3 of TABLE 2 require to be corrected as shown below:

TABLE 2-A

	Mean Decennial growth rate			
	1931-40		1941-50	
	According to Censuses of 1931 & 1941	Corrected for over-enumeration in 1941	According to Censuses of 1941 & 1951	Corrected for over-enumeration in 1941
East India	14.4	12.3	10.8	12.9
North-West India	16.7	16.0	9.0	9.8
INDIA	13.3	12.7	12.5	13.1

* This is *not* to assert that the Census figures of 1951, 1931, 1921 etc. are free from all error. The population totals of the 1951 Census are known to contain an element of under-enumeration—of which the magnitude has been estimated and published in Census of India Paper No. 1 of 1953. The conclusion reached here is simply that the Census of 1931, 1921 and 1911 contained an element of under-enumeration of substantially the same order, and that the figures of 1941 can be rendered comparable with them by a correction of the order indicated in TABLE 2-A.

III — Material supplied by the Superintendents of Census Operations

[This section contains a brief resume of facts recorded in birth-place tables of States as well as facts and opinion found in draft State Census Reports received from the Superintendents of Census Operations.]

16. **Uttar Pradesh**— (i) Out of 632 lakhs of persons enumerated in Uttar Pradesh, 14 lakhs were born outside including the displaced persons who numbered 4·8 lakhs. 15 lakhs of persons born in the State were enumerated in other States of India.

(ii) The Superintendent estimated the net migration of the decade as 5·2 lakhs including the displaced persons. [He had not, however, taken into account the displaced muslim emigrants to Pakistan from the state. Another report indicates that this number is approximately of the same order and may, therefore, be set off against the total number enumerated in the state as displaced persons.]

(iii) The Statistical Department of the State Government carried out a sample survey in 1949 in 44 districts (about 200 villages in each district). It was estimated that under-registration of births was of the order of 29·5%; and of deaths 24·3% for the whole state.

(iv) The Superintendent of Census Operations arranged for calculation of the birth-rate and death rate by the differencing method. This has led him to the conclusion that during the decade 1941—50 there was under-registration of births to the extent of 28·5% and of deaths to the extent of 32·0%; and that the true birth rate was 34·6 and the death rate was 24·3. [Here again, the reasoning has been affected by the omission to take Muslim emigrants to Pakistan into account, and the conclusions will need revision.]

There is a continuing drop in the birth rate in the State since 1921. The slow changes in the birth rate are mainly attributed to the direct and indirect effects of the alteration of age composition of population and its civil condition. The recent tendency towards a higher age of marriage may tend to lower the birth rate but improvement in maternal health and reduction in the number of widows are likely to have the opposite effect. The main factor that will affect the future trend will be the female proportion at the reproductive ages and the number of married females among them. The figures indicate that the birth rate may maintain the same level as during the decade

1941-50 or may show a slight decline during 1951-60.

17. **Bihar**— Out of 402 lakhs of persons enumerated in Bihar, 5·6 lakhs were born outside the state (including the Displaced Persons who numbered one lakh). 15·8 lakhs of persons born in the State were enumerated in other States of India.

18. **Orissa**— (i) Out of a population of 146 Lakhs, 1·97 lakhs were born outside the State. During the last decade there has been some fresh immigration owing to the development of industries and execution of large irrigation projects. The number of displaced persons was about 20,000 and there was no Muslim migration to Pakistan.

The number of persons born in Orissa and enumerated in other parts of India was 416,408. This takes into account the periodic migration of cultivators free from harvests at the time of Census, going to Bengal, Jamshedpur, etc. in search of employment, which has gone to swell the numbers. On the whole emigration is shrinking.

(ii) Efficiency of registration deteriorated during and after the World War II. Under registration of births may be of the order of 45% to 50% and of deaths from 33% to 40%. The Superintendent concludes that the real birth rate is likely to be 40 and the death rate to be 30. [All this, however, is very much of a guess, though, (as will be seen presently) evidence of a more substantial nature *also points* to much the same conclusion.]

(iii) There has been a fall in the birth rate. One of the direct causes of fall in the birth rate during the last decade is the decrease in the number of women belonging to the effective child-bearing age group, namely, between 15 and 34. The coming decade will be influenced by the undepleted and full-fledged reproductive age-groups and therefore unless other causes operate the birth rate is likely to increase.

19. **West Bengal**— (i) Out of the 248 lakhs of people in West Bengal 46 lakhs were born outside the State. This included 21 lakhs

of displaced persons and also 5 lakhs of persons born in Pakistan but not enumerated as displaced persons. 3 lakhs of persons born in West Bengal were enumerated in other states.

(ii) The Superintendent of Census Operations, estimate of average birth rate for the period 1941-50 was of the order of 41 to 42. On the basis of an estimate for the survival rate of the non-Muslim population, the death rate has been estimated to be of the order of 27 or 28.

(iii) The Director of Public Health carried out a sample survey in 1948 and obtained data regarding births and deaths and omissions in registration. It is reported that the 'formula of Chandrasekhar and Demming' was applied to these data and the conclusion was reached that a birth rate ranging from 34 to 43 (according to the area considered) and a death rate of about 29 were indicated.

20. **Assam**— (i) Out of 90 lakhs of persons enumerated in Assam, 77 lakhs were born in the state and 13 lakhs were born outside the state. Among the latter, 8.3 lakhs were born in Pakistan. Among these again, there were 2.8 lakhs who were enumerated as displaced persons. The balance consists mostly of Muslims from East Pakistan who were reported to have gone to Assam in considerable numbers during 1947-51. Assam-born population enumerated in other States of India is very small—about half a lakh.

(ii) Owing to the change of age composition of the people, it is said "Assam has now a larger proportion of infants and young persons than ever before in its history."

21. **Madras**— (i) Out of 570 lakhs of people enumerated in Madras 564½ lakhs were born in the state and 5½ lakhs were born outside the state. The number of persons born in Madras and enumerated in other states in India (at the 1951 Census) was 12 lakhs. About two-third of this number were found in other states of South India—5.3 lakhs in Mysore, 1.9 lakhs in Travancore-Cochin, and 0.5 lakhs in Coorg.

Emigration from Madras to countries outside India used to be fairly considerable formerly. According to the 1931 Census Report, the number of Madras-born persons living in foreign countries was estimated at 19 lakhs (or rather more than one-half of all the emigrants from the whole of India and Pakistan).

The Superintendent has attempted a similar estimate and has been led to the conclusion that

the corresponding number in 1951 is of the order of 17 lakhs. The order of magnitude of these figures seems to be correct; though they present considerable difficulties as regards the inferences to be drawn from them in respect of the actual direction and volume of movements into and out of the state during the last decade.

The Superintendent concludes his review with the opinion that difference between growth rate in 1941-50 (13.4) and that in 1931-40 (11.0) is not completely accounted for by natural increase; but that it is also due to the fall in emigration to outside countries and the return of emigrants notably from Burma, Ceylon and Malaya.

(ii) The registered birth rate (in 1941-50) is 30.8 and registered death rate is 20.6. The results of the Experimental Census showed an under-registration of births to the extent of 10.7% and under-registration of deaths to the extent of 15.7%. These data indicate a birth rate of 34.1 and a death rate of 23.8. The actual rates are unlikely to be very much higher, since Madras is one of the four states which are known to have a reasonably satisfactory system of registration.

(iii) The Superintendent thinks that the decline in the registered birth rate reflects a real fall in the birth rate; and that this fall is independently corroborated by a fall in the number of children aged 0 to 4 per 1000 married women. The relevant figures are as follows : 1931 (606); 1941 (561) & 1951 (522).

The Superintendent attributes the fall to "the pressure of economic conditions which came to a head during the War". He believes this pressure has made "at least some sections of the population more careful about too many children".

22. **Mysore**— (i) Out of 90.7 lakhs of people 84.5 lakhs of people were born in the state and 6.2 lakhs of people were born outside the state. The number of persons born in Mysore State and enumerated outside were 1.8 lakhs.

(ii) There are good reasons for believing that the state has received a net inflow of migrants from adjoining states during the decade 1941-50.

(iii) The Health Department staff in the various health centre areas in the state collected Vital Statistics by house-to-house enquiries. "They took special care to secure 100% accuracy."

According to this survey the crude birth and death rates were found to be 39.5 and 15.6 respectively in these areas. These rates tally with those of Ceylon which has recorded a very similar rate of population growth. The Superintendent considers that these rates are reasonable. He also refers to the view that there has been a deterioration in the efficiency of registration during World War II and since.

(iv) The outlook for 1951-60 is a higher birth rate than the decade 1941-50. The age-groups depleted by influenza and famine have passed beyond the child-bearing period. The future maternity age-groups will be undiminished in strength and will also be "assured of a higher rate of survival than at any time before in the history of Mysore". The rate of increase during 1951-60 is likely to touch even higher levels than 1941-50.

23. **Travancore-Cochin**— (i) Out of 93 lakhs of people in Travancore-Cochin 2 lakhs were born outside the state. 2 lakhs of people born in Travancore-Cochin were enumerated outside the state.

(ii) In 1948, the Department of Public Health conducted a survey in 30,535 houses scattered over 303 centres. The birth and death rates according to the survey were 34.9 and 11.4. The natural growth rate comes to 23.5 which is "more or less in agreement with Census growth rate of 21.2". Standardised death rate for the urban population of Trivandrum district for 1931 and 1941 was reached by applying the age distribution of the present Census to the age specific mortality rates. The mean of the two rates was 14.7. The Superintendent assumes that registration is practically complete in the urban areas of Trivandrum. Though this figure of 14.7 is low, there are good reasons for believing that the health standards are significantly higher and death rate significantly low in this State. Hence, he adds the growth rate to the death rate thus arrived at, the birth rate is deduced to be 35.9.

24. **Bombay**— (i) Out of 360 lakhs of people in Bombay, 22.5 lakhs of people were born outside the state. There were 3.4 lakhs of displaced persons. 4.4 lakhs of people born in Bombay were enumerated outside the state. 'Immigrants' have increased in number since

the 1931 Census, while the number of 'emigrants' has gone down.

(ii) There are good reasons for assuming a fairly substantial net inflow of migrants into the state during 1941-50.

(iii) The experimental census of births and deaths in sample households has disclosed an under-registration of 17.7% of registered births and 16.4% of registered deaths. If the registered rates for 1941-50 are increased by these percentages, then the following figures are obtained. Birth rate— 38.7; and death rate— 26.0.

25. **Madhya Pradesh**— (i). Out of 212.5 lakhs of people in Madhya Pradesh 205.2 lakhs were born in the state and 7.3 lakhs outside the state. The pattern is the same as at the earlier census except for immigration of displaced persons which was over a lakh. 4.6 lakhs of persons born in Madhya Pradesh were enumerated outside the state. Calculations during the decade 1921-30, show that there has been a net inflow of migrants both during 1921-30 and 1931-50, but the magnitude of the movement is small—rather less than one lakh per decade.

(ii) The experimental census of births and deaths in sample households held in 1952 has recorded an under registration of 10.3% of registered births and 14.2% of the registered deaths. The registered birth rate and death rate for Madhya Pradesh for the decade 1941-50 were 37.0 and 30.3. These data indicate a birth rate of 41.8 and a death rate of 34.6. Madhya Pradesh is one of the four states categorised as A; and the true rates are, therefore, not likely to be much in excess of these figures.

(iii) The Superintendent of Census Operations has examined the subject at considerable length and reached the conclusion that the trends as well as the differences in the trends occurring in the three different divisions of the state are clearly correlated to changes which have been occurring in the age-sex structure. He has also examined why these latter changes occurred and finds them to be the after effects of heavy abnormal mortality in the past in years of famine and influenza. The conclusion is reached that the birth rate is likely to remain substantially the same during 1951-60 as during 1941-50.

26. **Madhya Bharat** — Out of 79.5 lakhs of people in Madhya Bharat, 73.8 lakhs were

born in the State and 5.7 lakhs outside the State. This included 64,000 displaced persons from Pakistan. 3.3 lakhs of persons born in Madhya Bharat were enumerated outside the State. [This State is categorised as D.]

27. **Hyderabad**— Out of 187 lakhs of persons in Hyderabad 183 lakhs were born in the State and 4 lakhs were born outside the State. 6 lakhs born in Hyderabad State were enumerated outside. [This State is categorised as C.]

28. **Vindhya Pradesh**—Out of 35.7 lakhs of people in Vindhya Pradesh 34.8 lakhs were born in the State and 0.9 lakhs outside the State. Able-bodied persons are reported to go out when the ploughing operations are over (September-October) and return by the middle of July. The extent of this purely temporary migration is not known. [This State is categorised as D.]

29. **Rajasthan**—(i) Out of 152.9 lakhs of people in Rajasthan 146.4 lakhs were born in the State and 6.5 lakhs outside the State. This included 3.0 lakhs of displaced persons. 9.3

lakhs of people born in Rajasthan were enumerated in other States.

(ii) The net result of the analysis of the age structure tends to show that the birth rate is likely to show a slight rise during 1951—60. [This State is categorised as D.]

30. **Punjab**—(i) Out of 124 lakhs of people in Punjab, 98 lakhs were born in the State and 26 lakhs outside the State. This included 23 lakhs of displaced persons, 9 lakhs of persons born in Punjab were enumerated outside.

(ii) The Experimental Census of Births and Deaths in Sample Households held in 1953 has recorded under-registration amounting to 14.7% of registered births and 18.1% of registered deaths. The registered birth rate and death rate for Punjab during 1941—50 were 39.5 and 23.9 respectively. If the under-registration percentages as revealed by the Experimental Census are applied, a birth rate of 45.3 and death rate of 28.2 are indicated. [This State is categorised as A.] The actual birth and death rates are unlikely to be much higher than the figures above mentioned.

IV — *Result of study by Census Actuary*

31. Shri S.P. JAIN, the Census Actuary who prepared the life table from the 1951 Census data was also asked to compute the birth and death rates for the decade 1941—50 for different States and India from the available material. Shri JAIN has calculated the death rate and the birth rate by the 'differencing method' and also the birth rate by the 'reverse survival' method. From these data he has computed the birth and death rates for the various States. A detailed note has been prepared by Shri JAIN setting out the data used by him and the methods of calculation

adopted. The note is printed as *Annexure II*. Shri JAIN has taken note of the material supplied by Superintendents of Census Operations, has commented on the errors, omissions and other factors which raise doubts and difficulties about the assessment of migration change. Shri JAIN's conclusions are set out in TABLE 3 on next page. The rates finally suggested by his study are given in columns 2 & 3 of the Table. These figures give a birth rate of 39.9 per thousand and a death rate of 27.4 per thousand for Part A States.

TABLE 3

Zone and State	Estimate based on Differencing method		Estimated Birth rate based on Reverse Survival method
	Death rate	Birth rate	
I	2	3	4
North India			
Uttar Pradesh	27·2	38·6	37·1
East India			
Bihar	26·6	39·0	42·2
Orissa	29·9	37·2	39·3
West Bengal	28·6	35·4	35·3
Assam	31·8	46·7	49·8
South India			
Madras	22·8	35·7	34·7
Mysore	18·9	36·9	38·7
Travancore-Cochin	18·0	37·4	39·8
Coorg	18·6	38·7	38·7
West India			
Bombay	24·9	41·0	41·8
Saurashtra (including Kutch)	24·9	42·2	42·4
Central India			
Madhya Pradesh	38·5	46·1	45·1
Madhya Bharat	35·8	44·2	44·3
Vindhya Pradesh & Bhopal Hyderabad	29·5	43·1	47·2
North-West India			
Rajasthan	27·2	42·5	47·9
Punjab	26·3	41·2	40·8
PEPSU, Bilaspur & Himachal Pradesh	31·3	41·5	37·9
Ajmer	38·0	45·0	46·5
Delhi	26·3	41·2	41·1
ALL-INDIA	27·4	39·9	39·2

V — Maternity Data of the 1951 Census

32. Maternity data were collected in Travancore-Cochin and three divisions of East Madhya Pradesh, as part of the 1951 Census Operations. Similar data (though on a much smaller sample) were also collected in the rural areas of two groups of districts* of West Bengal in the course of training of census enumerators and Super-

visors. From the maternity data collected in these places, child birth indices and age specific maternity rates for married females aged 15—24, 25—34 and 35—44 were worked out. For a full description of these data as well as the methods of calculation adopted reference should be made to Census of India Paper No. 5 of 1953 'Maternity Data—1951 Census'. A note on the logistic graduation of maternity data, and derivation of table of age specific maternity rates, (printed as Annexure I in that Paper) is reproduced in Annexure III to this note.

*Group I—Birbhum, Bankura, Howrah, 24-Parganas, Malda and West Dinajpur.

Group II—Burdwan, Nadia, Murshidabad and Jalpaiguri.

It will be seen from this paper that upper limit estimates of birth rates were framed for the decade 1941-50 as below :

Travancore-Cochin	36.8
East Madhya Pradesh	46.4
North-West Madhya Pradesh	41.7
South-West Madhya Pradesh	43.5
West Bengal (I)	35.5
West Bengal (II)	37.4

33. It cannot be assumed that the child bearing habits of mothers in one part of India are the same as those of mothers in another part of India. But if we apply the age specific maternity rates obtained for the areas mentioned above to the age structure of married females in India, the zones and Part A States, we obtain a range of expected birth rates for the decade 1941-50 as shown in TABLE 4 below :

TABLE 4

<i>Expected birth rates— by applying the maternity rates of</i>						
<i>India, Zone and State</i>	<i>Travancore Cochin</i>	<i>East Madhya- Pradesh</i>	<i>North-West Madhya Pradesh</i>	<i>South West Madhya Pradesh</i>	<i>West Bengal (I)</i>	<i>West Bengal (II)</i>
1	2	3	4	5	6	7
INDIA	42	43	38	42	35	36
North India	43	44	39	43	36	37
East India	42	43	38	42	35	36
South India	41	42	37	41	34	35
West India	43	44	39	43	36	37
Central India	44	46	40	44	37	38
North-West India	41	42	37	41	34	35
STATES						
Uttar Pradesh	43	44	39	43	36	37
Bihar	42	43	38	42	35	36
Orissa	43	43	39	43	36	37
West Bengal	41	43	38	41	35*	38*
Assam	39	40	35	39	33	33
Madras	42	42	38	41	35	36
Bombay	43	44	39	43	36	37
Madhya Pradesh	43	44	39	43	36	37
Punjab	38	39	35	38	32	33

VI — Combined final review of all available material

34. The first part of the problem as set out in first Section of this note is to ascertain whether definite figures can be arrived at which may be regarded, with reasonable probability, as representing actual average birth rate and actual average death rate during the decade 1941-50. The nature of the material, which has been described already, indicates clearly

that the most difficult part of the analysis lies in assigning a value for the effect of net migration and isolating it. The difficulties are specially accentuated by the fact that birth place data collected at the 1941 Census have not been tabulated for most States. A great many territorial changes have occurred and the movement of large masses of displaced persons has to be taken into account. While these difficulties are real they do not disable us altogether from arriving at reasonably clear conclusions. This is especially true when these conclusions are limited to

* These rates have been obtained by applying the Maternity Rates of West Bengal (I) and (II) to the married females of the corresponding sample districts of West Bengal.

India and the Zones. The scope of this note, as mentioned already, is limited accordingly.

35. (i) The number of partition displaced persons from Pakistan enumerated at the 1951 Census in India was about 72 lakhs. In addition, nearly 12 lakhs of Pakistan-born persons have been enumerated in East India. From the Pakistan Census Bulletin No. 1 of 1952, it is found that nearly 71.5 lakhs* of displaced persons from India were enumerated in Pakistan. These figures indicate that the number of uprooted people who migrated from one country to another were very nearly the same. *The net result of the abnormal movement of partition displaced persons is statistically negligible as a component part of the growth rate of the decade 1941-50, so far as the country as a whole is concerned.* That is an important conclusion which simplifies further analysis to a large extent.

(ii) So much for one type of abnormal movements. There was another, earlier in the decade, shortly after Japan entered the War and overran Malaya and Burma. Large number of Indians who had emigrated to these countries earlier returned to India at that time. A special count of these migrants was made under the Asiatic British Evacuees Census Order, 1943 issued by the Government of India under Rule 24 (a) of the Defence of India Rules. The total number of migrants counted at that Census was 3.9 lakhs, of whom 2.7 lakhs came to the present territory of India. Of this total of 2.7 lakhs, 1.6 lakhs went to South India and nearly half a lakh to East India and less than half a lakh to North India. In the other three zones, the numbers were negligible. There are some reasons for believing that this count was not complete.

* The Pakistan Census figures for displaced persons from India are not yet available by 'state of origin'. A tentative allocation has been made of these figures on a zonal basis (with reference to tentative estimates made by Census Superintendents) as shown below :

	<i>In lakhs</i>
North India	5.8
East India	7.6
South India . . . . .	...
West India	1.2
Central India	0.8
North-West India	56.1
	<u>71.5</u>

The migrants who were *not counted*, it was thought at that time, might have been one lakh.

36. In the past, India was an emigrating country. At the time of 1931 Census, nearly 35 lakhs of Indians were living in other countries including Burma, while the number of persons born in other countries and enumerated in India was only 7 lakhs. The figures relate to undivided India; the share of the territory now in Pakistan is likely to be small in respect of emigrants.

The number of persons born in other countries and enumerated in India according to the 1951 Census was 87 lakhs, which included 82 lakhs of persons born in Pakistan. The remaining 5 lakhs were born in other countries. The figures indicate that changes, if any, in the movement of foreign-born persons into and out of India are quite insignificant in relation to the growth of population. What is the position regarding movement of India-born persons to and from foreign countries (other than Pakistan) ?

It has been seen already that there was one abnormal influx in or about 1942, of which the size (so far as India within its present boundary was concerned) was of the order of about 4 lakhs. To what extent should that figure be added to or diminished on account of normal movements ? According to the latest figures available, the combined total of Indians and Pakistanis living abroad appears to be of much the same order as in 1931. If allowance is made for natural increase in the numbers of the 1931 emigrants it is to be presumed that there must have been a net inflow of returning emigrants into India. It is also well known that there has been no significant emigration from India to countries other than India after 1931. Restrictions were imposed by different countries on immigration from time to time. On the whole it is safe to suppose that the direction of these normal movements during the decade was a net inflow rather than a net outflow, and its size was unlikely to exceed one or two lakhs if the abnormal inflow was only of the order of 4 lakhs. Assuming that the total net inflow was as much as 6 lakhs during 1941-50, it would account only for a couple of decimal points, in the all-India growth rate of the decade. Indeed, it would be necessary to postulate a net inflow of well over 16 lakhs, if it is to account for just one half of one per cent of the all-India growth rate. This is, on all the evidence, a very unlikely figure.

Thus we are led to the conclusion that the all-India growth rate must be substantially the same as the all-India rate of natural increase or the excess of the all-India birth rate over the all-India death rate.

This is an important conclusion, as it helps to simplify further analysis.

37. TABLE 5 gives an extract of birth place statistics of the 1951 Census as compiled for the six zones and for all-India.

TABLE 5

(FIGURES IN LAKHS)

Born in	Enumerated in							India
	North India	East India	South India	West India	Central India	North-West India		
North India	618	5	...	3	3	5	634	
East India	2	852	...	...	1	...	856*
South India . . . . .	...	1	753	4	2	...	760
West India . . . . .	...	...	1	387	3	...	391
Central India	2	1	1	5	509	1	520*	
North-West India	4	2	...	3	3	308	318*	
Pakistan	5	38	...	4	2	33	82	
Other Non-Indian territories	1	2	1	1	...	...	5

38. We have now to make a broad assessment of the net migration factor for each zone, being helped by the following main considerations :

(a) the assessment for each zone should be relatable to the order of magnitude of the figure for that zone in TABLE 5.

(b) the combined result for India should be a very small net inflow of the order mentioned in para 36.

The resulting assessment of net migration during the decade 1941-50 is given in the table below :

TABLE 6

Zone	Estimate of probable migration (IN LAKHS)	Net emigration (-) / Net immigration (+) [MEAN DECENNIAL RATE]	Mean decennial rate of natural increase
North India . . . . .	...	...	+11
East India	+10 to +15	+1.2 to +1.8	+11 or +12
South India	+3 to +4	+0.4 to +0.6	+15
West India . . . . .	...	+14	+16
Central India . . . . .	...	...	+10
North-West India	-20 to -25	-6.0 to -7.5	+16 or +17
INDIA	+7 to +8	...	+13

*Small discrepancies in totals due to rounding.

39. The following comments are offered by way of further explanation of the figures in TABLE 6 :

(i) *North India & Central India.*—The movement of partition displaced persons was approximately the same in both directions so far as North India is concerned. They are negligible in both directions so far as Central India is concerned. The birth place statistics indicate that inter-zonal movements of a normal character are relatively small and the net balance one way or another may be ignored.

(ii) *East India.*—This is a very difficult zone to assess; but there are a number of converging considerations. The birth place table shows that there were 38 lakhs of immigrants from Pakistan against 26 lakhs returned as displaced persons. According to Pakistan Census authorities there were nearly 15-20 lakhs of immigrants from India in East Pakistan against 7 lakhs returned as displaced persons. Out of those who did not return themselves as displaced persons, it is not clear how many migrated during the decade. Apart from partition movements between East India and East Bengal, there must have been some movement from other zones to East India. Taking all these into consideration, it is estimated that East India should have received a net inflow during the period to the extent of 10 to 15 lakhs.

(iii) *South India.*—South India used to send out emigrants to Ceylon and Burma and other countries in larger number than all other zones of India and Pakistan put together. But this has been drying up since 1931 and has more or less ceased. On the other hand, a reverse movement has been proceeding at the same time of which the arrival of large numbers from Burma in or about 1942 was the most conspicuous. [There are fairly important trends of internal movement within the zone, but they need not concern us.] The net migration position, it is fairly clear, is an *inward* movement. It is probably of the order of 3 to 4 lakhs.

(iv) *West India.*—West India has had a net inflow of partition displaced persons of the order of 4 lakhs. The birth place statistics show that in the zone there are nearly 15 lakhs of immigrants against 4 lakhs of emigrants. There is little doubt that during the last decade West India has been attracting immigrants from other zones to an even larger extent than in the past.

But it is difficult to locate the sources and define the magnitudes precisely. Whereas in respect of India and some of the zones, it is possible to use an assessment of the migration factor as one of the considerations in fixing the birth rate and death rate, it is necessary—in respect of West India—to do the opposite. Here information regarding births and deaths has to be considered first and a figure for net migration is fixed so as to be consistent with it. Hence the assumption of 10 lakhs of net inflow from other zones, in addition to 4 lakhs of displaced persons from Pakistan.

(v) *North-West India.*—Thirty three lakhs of persons born in Pakistan have been enumerated in North-West India. It is estimated that 56 lakhs of emigrants have gone to Pakistan. The difference is a net loss of 23 lakhs. The migration between North-West India and the other zones during the decade may be reasonably regarded as negligible. Hence the assumption of a net outflow of the order of 20 to 25 lakhs.

This is confirmed independently by the following consideration. The gain in East India, South India and West India for the decade has already been estimated at 27 to 33 lakhs. The assumption made in respect of North-West India leads to a net migration position for India of the order of 7 to 8 lakhs, from what has already been stated in paras 32 to 36 this is just about right.

40. We thus reach the position that the net effect of migration is allowed for, and the true rates of natural increase are settled as in column 4 of TABLE 6. That is to say, the natural increase rate was 13 per cent. for the country as a whole during 1941-50. Three zones had lower rates, *viz.*, Central India (10), North India (11), and East India (11 or 12). The other three zones had higher rates: South India (15), West India (16) and North-West India (16 or 17). What is the break-up of these rates into birth rates and death rates? This question is answered zone by zone and finally for India in the next seven paragraphs. In every case, the best conclusion to be reached, on available evidence, about the birth rate is first settled. The value for the death rate follows.

41. *North India.*—Shri S. P. JAIN, has reached three figures for the birth rate—38.6, 37.1 and 35.9. He rejects the last and prefers the first as the best estimate. The Superintendent of

Census Operations had originally estimated the birth rate at 34.6 allowing 28.5% for omissions in birth registration. He has since agreed that his figure must be raised for the reason that he took into account the number of displaced persons in Uttar Pradesh but not the emigration of Muslims to Pakistan.

The birth rate for Uttar Pradesh derived from the maternity rates of North-West Madhya Pradesh and West Bengal (II) work out to be 39 and 37 respectively. On *a priori* grounds, it seems likely that child bearing habits in Uttar Pradesh approximate more nearly to North-West Madhya Pradesh than to West Bengal. On the whole, there is fairly convincing evidence to the effect that the birth rate of North India (for 1941-50) must be 38 to 39. Since the rate of natural increase has been fixed at 11, the death rate should be between 27 and 28.

42. *East India.*— (i) BIHAR— There is no material other than the rates derived from maternity rates and Shri S.P. JAIN's estimates. The maternity rates of North-West Madhya Pradesh give 38 as the birth rate of Bihar. Both the West Bengal maternity rates give somewhat lower figures, *viz.*, 35 and 36. Shri JAIN's estimates are 39 by differencing method and 42 by the reverse survival method. He prefers the former. This independently seems to be probable. If maternity rates in North Bihar and South Bihar division follow the Uttar Pradesh pattern (assumed to be substantially the same as the North-West Madhya Pradesh) and if the Chhota Nagpur division of Bihar follows the same pattern as East Madhya Pradesh, the resulting rate is almost exactly 39. Hence 39 is accepted as a figure for Bihar, at any rate for use in building up the East India birth rate.

(ii) ORISSA— Shri JAIN has arrived at two figures—37.2 and 39.3—and prefers the former which is based on the differencing method. The latter is based on the reverse survival method. There are some reasons which indicate that the higher figure is perhaps nearer the truth. The application of maternity rates of other areas to Orissa leads to the following results. If the maternity pattern of East Madhya Pradesh (which seems to be suitable for Chhota Nagpur division of Bihar) is also accepted as suitable for the Inland Division of Orissa; and if either of the two West Bengal patterns is accepted as applicable to the Coastal Division of Orissa, the resulting birth rate is 39 or 40. This was also

the figure mentioned independently by the Superintendent of Census Operations (albeit on grounds which were little better than a guess). On the whole 39 (which is the higher of the two figures reached by Shri JAIN) is indicated as the birth rate of Orissa and accepted accordingly.

(iii) WEST BENGAL— The Superintendent's estimate of the birth rate is 41 or 42. He has, however, also stated that the application of "Chandrasekhar and Demming formula" to the results of a survey conducted by the Director of Health Services in 1948, indicates a birth rate having a wide range from as low as 34 to as high as 43 according to the area considered. The maternity rates for the two groups of districts in West Bengal give the birth rates as 35.5 and 37.4 respectively. Shri JAIN's estimate is 35.4 according to differencing method and 37.4 according to reverse survival method. The latter is reduced to 35.3 after adjustment Shri JAIN prefers 35.4 as his computed rate. But, on *a priori* grounds, there is justification for placing greater reliance on the higher figure given by the reverse survival method in those cases where there is room for much uncertainty about the migration element. As it happens, this is the case in West Bengal. The reverse survival method yields the higher figure, otherwise indicated as more probable. In the circumstances, 37 is accepted as the birth rate for West Bengal for use in building up the East India Birth Rate.

(iv) ASSAM— Available data are so scanty and also so defective that no statement whatever can be hazarded about the birth rate of Assam.

(v) ZONE AS A WHOLE— The zonal birth rate may be taken to be the weighted mean of the birth rates (mentioned already) as accepted for Bihar, Orissa and West Bengal; the figure for each state being weighted by the mean population of the state. We thus get the zonal rate as either 38 or 39. (This is the same as the conclusion already reached for North India). Since the natural increase of East India has been fixed as 11 or 12, the death rate must be either 26, 27 or 28.

43. *South India.*— (i) MADRAS— Shri S.P. JAIN's estimates of the birth rate are 35.7 according to differencing method and 34.7 according to reverse survival method and he prefers the former. The registered birth rate, corrected for under-registration as assessed by the Experimental Census yields a figure of 34.1. The

true figure must be above this— but not perhaps very much higher, since Madras is categorised *A*. If the West Bengal pattern is applied to the age-sex-marital status structure of Madras, we get 35 or 36 as the birth rate. If the higher maternity pattern of Travancore-Cochin is applied, the result would be very much higher *viz.*, 42. If we accept Shri JAIN's estimate and fix the birth rate as 36, it would follow that the maternity rates for Madras (as a whole) are substantially lower than in Travancore-Cochin, and not very dissimilar to those prevailing in West Bengal and the Coastal division of Orissa. This might well be the case. The birth rate for Madras is therefore taken to be 36.

(ii) MYSORE— The Superintendent's estimate of the birth rate is 39.5. Shri JAIN's estimates are 36.9 according to the differencing method and 38.7 according to the reverse survival method. As will be seen below, the Travancore-Cochin birth rate is fairly clearly established as 37. On *a priori* grounds, it seems unlikely that the Mysore rate will be higher than Travancore-Cochin, but the possibility cannot be ruled out. A special enquiry (carried out jointly by the Government of India and the United Nations) has been recently concluded in this state. The result of this enquiry is not yet available. For present purposes— *viz.*, the making of an assumption about Mysore, in order to build up the South India birth rate— it is assumed that anything between the two figures stated by Shri JAIN, is possible. The birth rate may be 37, 38 or 39.

(iii) TRAVANCORE-COCHIN — The birth rate is 37.4 by differencing method and 39.8 by reverse survival method. The Public Health Department had reached a figure of 34.9 by an estimate of under-registration of births. As omissions are known to be numerous in this State, even a corrected registration figure must be somewhat on the low side. The true birth rate— there is little doubt— must be not less than 35. The Superintendent estimates the birth rate at 35.9, on the basis of death registration data for urban areas in Trivandrum district which are stated to be complete. The maternity data yield the rate of 36.8. There is thus converging testimony of a fairly convincing nature pointing to 37 as a good estimate of the birth rate. It is accepted accordingly.

(iv) ZONE AS A WHOLE— The zonal rate may now be fixed, as the weighted mean of the rates

for Madras, Mysore and Travancore-Cochin. We get 36 or 37 as the birth rate for the zone. The natural increase rate is 15. The death rate is therefore 21 or 22.

44. *West India.*— The rates to be fixed for the zone must be the same as those for Bombay— since there are no registration data for Saurashtra and Kutch and since Shri JAIN's estimates are substantially the same for Bombay and Saurashtra. Shri JAIN's differencing method gives 41 as the birth rate for Bombay, while the reverse survival method gives 41.8 as the birth rate. He prefers 41. The figures for Saurashtra are 42.2 and 42.4. If the whole of West India had the same maternity pattern as South West Madhya Pradesh, the birth rate would be 43. On the other hand, if North-West Madhya Pradesh pattern were in force, the birth rate would be 39. The registration data for Bombay (corrected for omissions on the basis provided by the Experimental Census) yield a birth rate of 39, and a death rate of 26. It is impossible to accept both figures as simultaneously corrected the reason being that, in that case, the natural increase rate would be only 13, and we should be forced to assume a net migration of the order of 25 lakhs. It is not possible satisfactorily to locate sources from which movements in such numbers could have taken place within a decade. The best conclusion to be drawn from available data would appear to be : (a) a zonal birth rate of 42, (b) a zonal death rate of 26, and (c) a net inflow by migration into the zone of about 10 lakhs from other zones in India, in addition to 3 lakhs of displaced persons from Pakistan *vide* para 39 (iv) above. It will be noted that a birth rate of 42 is Shri JAIN's higher figure based on reverse survival. As already mentioned, there is justification for preferring it in those cases where assumptions about migration are relatively important as well as uncertain. The choice of 42 involves also the corollary that the maternity rates of West India are a shade below those of South West Madhya Pradesh and distinctly higher than those of North-West Madhya Pradesh. There is nothing impossible about this corollary; in view of the known composition of the people in those areas it is indeed quite credible.

45. *Central India.*— (i) MADHYA PRADESH— Shri S. P. JAIN has arrived at two rates 45.1 and 46.1. Maternity data

yield the following birth rates for the three divisions of Madhya Pradesh :

East Madhya Pradesh . . .	46·4
North-West Madhya Pradesh . .	41·7
South-West Madhya Pradesh . .	43·5

The average rate for the entire state is 44·4. There is thus a good case for accepting 44 or 45 as the correct figure of the birth rate. There is however a difficulty. Madhya Pradesh, as mentioned already has a reasonably satisfactory registration. The registered birth rate is 37·0. According to the Experimental Census, omissions are 10·3% of registered births. This would yield only a true birth rate of 41. If 44 or 45 is correct, then the omissions must be of the order of 20%. On the whole, the weight of evidence of three entirely distinct methods of computation should be preferred, and birth rate of 44 or 45 adhered to. It would then follow either that the Experimental Census was rather less complete in the detection of omissions than would be expected in a state categorised as A or alternatively that the registration of births is better this year as compared with the decade 1941-50. The latter is the more probable inference, because it is known that there was some deterioration during the War and the first few post-War years and there has been an opportunity in recent years to bring about improvement.

(ii) MADHYA BHARAT, VINDHYA PRADESH AND BHOPAL—The birth rate according to Shri JAIN's differencing method and the reverse survival method are practically identical and the rate is 44. There are no other data. This figure (44) is accordingly accepted.

(iii) HYDERABAD—The birth rate reached by Shri JAIN through the differencing method is 43·1. According to the reverse survival method the figure is 47·2. The former seems to be preferable for the reason that Hyderabad is unlikely to have a higher birth rate than Madhya Pradesh. It is probably intermediate between Madhya Pradesh and Bombay. 43 is, therefore, accepted as the birth rate for Hyderabad.

(iv) ZONE AS A WHOLE—The birth rates above mentioned for individual states yield a zonal birth rate of 44. The natural increase rate is 10; and hence the zonal death rate must be fixed as 34.

46. *North-West India.*—(i) PUNJAB—The birth rate arrived at by Shri S. P. JAIN is 41·2 according to differencing method and 37·6 according to the reverse survival method. The latter figure is revised to 40·8 after adjustment. Shri JAIN prefers the first. The application of maternity data to the age-sex-marital status of the Punjab (both in 1941 and in 1951) leads to the following results :

If the Punjab pattern follows that of South-West Madhya Pradesh, the birth rate would be 39·8. If the East Madhya Pradesh pattern is applicable, the birth rate would be 41·1. On the other hand, if the pattern is the same as in North-West Madhya Pradesh (which, by assumption, is much the same as that of Uttar Pradesh) the birth rate could be only 36·4. Thus the indications given by the maternity rates are consistent with Mr. JAIN's results—but there is no clear ground for preferring the higher figure to the lower.

When we turn to the registration data for an indication on this point, a difficulty arises, because they point to a higher level than the figure 41. The registered birth rate for 1941-50 is 39·5. The Experimental Census of Births and Deaths held in 1952 indicates omissions in births of the order of 14·7% of registered births. If this was true of the decade as a whole, the birth rate would be as high as 45·3. Could this possibly be correct? Apparently not, because a careful computation made by the Superintendent of Census Operations, Punjab who reported on the 1931 Census showed a birth rate of only 43·9 for the decade 1921-30. It is very unlikely that the true figure for 1941-50 would exceed it—when the trend is the other way about almost everywhere else.

How are we to reconcile a birth rate figure which does not appreciably exceed 41, with a registered birth rate of 39·5, to which must be added something on account of omissions, even if it be not 14·7%? The explanation seems to lie in the mass movements of population which took place in 1947, and which resulted in a net reduction of numbers during the last three years of the decade. This is a peculiar circumstance affecting the Punjab and it is calculated to yield an exaggerated figure as the registered birth rate, because the arithmetical mean of the population in the years 1941 and 1951 must be smaller than the actual average of the mean population from year to year during the decade

[The registered death rate must also be exaggerated for the same reason.]

If we allow for this peculiarity, it is seen that Shri JAIN's figure of 41 is adequately corroborated and may be accepted as the birth rate of the Punjab.

(ii) REST OF THE ZONE—The data available for the rest of North-West India are exceedingly sketchy. Shri JAIN has been unable to reach any definite opinion, but has mentioned the following birth rates:

State	Differencing Method	Reverse Survival Method
Rajasthan	42.5	47.9
Bilaspur and Himachal Pradesh	41.5	37.9
Ajmer	45.0	46.5
Delhi	41.2	45.6

(iii) ZONE AS A WHOLE—If we consider the figures in the light of the Punjab birth rate fixed at 41, the zonal birth rate for North-West India may be fairly taken to be 41 or 42. As the natural increase rate is fixed already at 16 or 17, the zonal death rate must be 24, 25 or 26.

47. Rates for India—The rates for India may now be fixed as the weighted mean of the

rate for the six zones. The result is a birth rate of 40, and death rate of 27; and growth rate of 13 for the decade 1941—50 for the country as a whole.

TABLE 7 gives, the birth rates, the death rates and the natural increase rates for the six zones and for all-India.

TABLE 7

India and Zones	Mean Decennial Rates (1941—50)		
	Birth	Death	Natural Increase
North India	38-39	27-28	11
East India	38-39	26-27-28	11 or 12
South India	36-37	21-22	15
West India	42	26	16
Central India	44	34	10
North-West India	41-42	24-25-26	16-17
INDIA	40	27	13

The figures of this table furnish the answers to the questions posed in para 7 of this note—with as much certainty as the nature of available evidence permits.

48. The following table shows the assessment of under-registration of birth rates for individual states arranged in order of their efficiency of registration :

TABLE 8

State	Mean Decennial Birth Rate		Percentage of unregistered births to estimated total number of births
	Registered	Estimated	
Punjab	39.5*	41	Under 13
Madras	30.8	36	15
Madhya Pradesh	37.0	44-45	16 to 18
Bombay	32.9	42	22
Orissa	28.2	39	28
Uttar Pradesh	24.8	38-39	35 to 36
Bihar	21.9	39	44
West Bengal	20.5	37	45
Travancore-Cochin	20.3	37	45
Mysore	16.2	37 to 39	Over 50

* This figure needs revision for reasons set out in para 16 (i).

ANNEXURE I

Mean Decennial Growth Rate

ANNEXURE

Mean decennial growth rate during

State and Division	Mean Population of decade			Mean Population of decade for area under registration of Births and Deaths		
	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30
I	2	3	4	5	6	7
INDIA	335,842,031	294,962,755	261,633,608	250,395,171	222,958,843	198,928,118
North India	59,873,795	52,980,504	48,062,327	58,473,509	51,714,550	46,891,851
East India	85,520,764	75,465,814	66,434,604	75,744,434	66,744,738	58,733,204
South India	70,219,076	61,262,039	54,710,864	61,828,835	54,358,133	49,061,456
West India	36,955,421	30,983,387	27,056,170	22,327,147	21,029,217	18,402,266
Central India	49,770,923	44,741,680	39,747,818	17,423,992	16,053,050	14,519,032
North-West India	33,469,682	29,497,715	25,593,550	14,597,254	13,059,155	11,320,309
Andaman and Nicobar Islands	32,370	31,616	28,275	...	...	...
NORTH INDIA						
Uttar Pradesh	59,873,795	52,980,504	48,062,327	58,473,509	51,714,550	46,891,851
1·11 Himalayan Uttar Pradesh	2,383,318	2,109,584	1,898,675	1,978,610	1,736,113	1,564,681
2·14 East Uttar Pradesh Plain	16,957,939	15,170,051	13,826,610	16,472,544	14,748,701	13,449,544
2·21 Central Uttar Pradesh Plain	15,217,534	13,418,754	12,225,503	15,217,534	13,418,754	12,225,503
2·22 West Uttar Pradesh Plain	21,543,957	19,038,752	17,200,147	21,033,774	18,567,619	16,740,731
3·21 Uttar Pradesh Hills & Plateau	3,771,047	3,243,363	2,911,392	3,771,047	3,243,363	2,911,392
EAST INDIA						
Bihar	38,377,033	34,542,179	30,866,767	38,174,360	34,346,156	30,697,207
2·12 North Bihar Plain	17,441,948	15,932,624	14,595,382	17,441,948	15,932,624	14,595,382
2·13 South Bihar Plain	10,523,775	9,191,013	8,031,345	10,523,775	9,191,013	8,031,345
3·31 Chhota Nagpur	10,411,310	9,418,542	8,240,040	10,208,637	9,222,519	8,070,480
Orissa	14,206,967	13,129,522	11,824,821	7,753,569	7,285,289	6,582,345
3·33 Orissa Inland	7,667,630	6,940,704	6,072,941	1,864,640	1,676,007	1,332,585
5·11 Orissa Coastal	6,539,337	6,188,818	5,751,880	5,888,929	5,609,282	5,249,760
West Bengal (excluding Chandernagore)	23,323,802	19,750,361	17,032,132	22,667,802	19,134,497	16,440,444
1·25 Himalayan West Bengal	1,946,934	1,756,297	1,609,487	1,290,934	1,140,433	1,017,800
2·11 West Bengal Plain and Chandernagore	21,420,964	18,026,837	15,448,988	21,376,867	17,994,064	15,422,645
Assam	8,318,372	6,968,747	5,830,523	...	...	...
1·21 Assam Plains	7,148,703	5,978,796	5,013,208	7,148,703	5,978,796	5,013,208
1·22 Assam Hills	1,169,669	989,951	817,315	...	...	...
1·23 Manipur	544,852	478,838	414,811	...	...	...
1·24 Tripura	576,020	447,730	343,443	...	...	...
1·26 Sikkim	129,622	115,664	95,764	...	...	...
SOUTH INDIA						
Madras	53,423,375	47,240,116	42,621,002	53,423,375	47,240,116	42,621,002
3·54 Madras Deccan	4,759,878	4,263,064	3,855,317	4,759,878	4,263,064	3,855,317
4·23 West Madras	6,240,106	5,367,462	4,772,157	6,240,106	5,367,462	4,772,157
5·12 North Madras	13,587,438	12,079,743	10,800,811	13,587,438	12,079,743	10,800,811
5·21 South Madras	28,835,953	25,529,846	23,192,716	28,835,953	25,529,846	23,192,716
3·53 Mysore	8,206,395	6,951,991	6,276,872	8,206,395	6,951,991	6,276,872
4·24 Travancore-Cochin	8,390,241	6,903,906	5,649,408	8,390,241	6,903,906	5,649,408
4·25 Coorg	199,065	166,026	163,582	199,065	166,026	163,582

NOTE:—Totals for India and Zones (cols. 5-7, 14-16 and 20-22) do not include the figures for the areas of Category 'C' (Travancore-Cochin and Himachal Pradesh) because the birth/death registration data in these states is not regarded as reasonably satisfactory.

three decades—General Population

State and Division	Mean Population of decade			Mean Population of decade for area under registration of Births and Deaths		
	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30
I	2	3	4	5	6	7
WEST INDIA						
Bombay	32,568,648	27,211,911	23,797,942	22,327,147	21,029,217	18,402,266
3·43 Bombay Deccan Northern	11,212,171	9,436,000	8,140,444	8,793,519	8,614,181	7,430,023
3·52 Bombay Deccan Southern	4,349,809	3,790,153	3,418,962	3,698,632	3,225,512	2,917,697
4·11 Bombay Gujrat	10,452,380	8,707,802	7,477,030	3,686,077	4,286,369	3,633,986
4·21 Greater Bombay	2,267,219	1,498,842	1,298,336	2,267,219	1,498,842	1,298,336
4·22 Bombay-Konkan	4,287,069	3,779,114	3,463,170	3,881,700	3,404,313	3,122,224
4·12 Saurashtra	3,849,030	3,257,288	2,755,706	...	...	...
4·13 Kutch	537,743	514,188	502,522	...	...	...
CENTRAL INDIA						
Madhya Pradesh	20,439,573	18,711,755	16,794,089	17,423,992	16,053,050	14,519,032
3·24 North-West Madhya Pradesh	5,326,047	4,940,428	4,514,467	5,309,452	4,925,492	4,500,308
3·32 East Madhya Pradesh	9,742,552	8,730,158	7,664,779	6,743,566	6,086,389	5,403,882
3·41 South West Madhya Pradesh	5,370,974	5,041,169	4,614,843	5,370,974	5,041,169	4,614,843
Madhya Bharat	7,562,017	6,733,871	5,963,007	...	...	...
2·35 Madhya Bharat Lowland	1,605,164	1,413,837	1,249,297	...	...	...
3·13 Madhya Bharat Plateau	4,383,909	3,911,418	3,481,960	...	...	...
3·14 Madhya Bharat Hills	1,572,944	1,408,616	1,231,750	...	...	...
Hyderabad	17,491,114	15,377,645*	13,442,946*	...	...	...
3·42 North Hyderabad	5,665,302	5,102,742	4,468,566	...	...	...
3·51 South Hyderabad	11,825,812	10,279,023	8,986,728	...	...	...
3·22 Vindhya Pradesh	3,470,670	3,167,101	2,842,950	...	...	...
3·23 Bhopal	807,549	751,309	704,827	...	...	...
NORTH-WEST INDIA						
Rajasthan	14,298,514	12,285,266	10,566,194	...	...	...
2·34 East Rajasthan Plain	6,163,904	5,370,356	4,770,051	...	...	...
2·41 Rajasthan Dry Area	4,269,241	3,537,658	2,855,790	...	...	...
3·11 Rajasthan Hills	1,939,031	1,652,820	1,415,001	...	...	...
3·12 Rajasthan Plateau	1,926,338	1,724,432	1,525,352	...	...	...
Punjab	12,669,904	11,735,879	10,279,187	12,627,715	11,736,733	10,281,057
1·13 Himalayan Punjab	952,445	873,407	810,821	960,073	888,026	824,745
2·31 Punjab Plain	11,717,459	10,862,472	9,468,366	11,667,642	10,848,707	9,456,312
1·12 Himachal Pradesh and Bilaspur	1,083,589	1,005,994	922,161	1,18,218	105,665	99,497
2·32 Patiala & East Punjab States Union	3,448,136	3,148,154	2,786,756	...	...	...
2·33 Delhi	1,331,006	777,093	562,349	1,331,006	777,093	562,349
2·36 Ajmer	638,533	545,329	476,903	638,533	545,329	476,903

*An adjustment on account of the transfer of a number of villages has been made in Hyderabad State total, therefore, it does not tally with the division totals where no similar adjustments could be made.

ANNEXURE

Mean decennial growth rate during

State and Division	Growth of Population during decade			Mean decennial growth Rate			Registered Births during decade		
	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30
I	8	9	10	11	12	13	14	15	16
INDIA	42,074,730	39,313,042	27,345,810	12.5 (12.4)	13.3 (13.0)	10.4 (9.6)	68,047,335	75,349,879	66,939,428
North India	6,683,894	6,731,904	3,105,013	11.2 (11.2)	12.7 (12.8)	6.5 (6.5)	14,479,317	17,667,306	15,921,016
East India	9,218,884	10,891,018	7,171,398	10.8 (10.8)	14.4 (14.3)	10.8 (10.4)	16,408,593	19,893,444	19,069,737
South India	10,763,454	7,150,621	5,951,730	15.3 (14.5)	11.7 (11.0)	10.9 (9.4)	17,791,194	17,807,862	14,775,787
West India	7,411,389	4,532,679	3,321,756	20.1 (20.8)	14.6 (14.5)	12.3 (12.1)	7,341,581	7,816,171	6,603,769
Central India	4,994,073	5,064,413	4,923,311	10.0 (7.2)	11.3 (9.3)	12.4 (10.9)	6,446,177	6,608,830	6,008,081
North-West India	3,005,833	4,938,102	2,870,225	9.0 (6.0)	16.7 (17.5)	11.2 (10.6)	5,580,473	5,556,266	4,561,038
Andaman and Nicobar Islands	-2,797	4,305	2,377	-8.6	13.6	-8.4	...	...	...
NORTH INDIA									
Uttar Pradesh	6,683,894	6,731,904	3,105,013	11.2	12.7	6.5	14,479,317	17,667,306	15,921,016
1.11 .	277,338	270,582	151,237	11.6	12.8	8.0	578,877	634,318	543,583
2.14 .	1,857,725	1,718,051	969,369	11.0	11.3	7.0	3,594,059	4,478,270	4,040,252
2.21 .	1,824,713	1,775,300	611,202	12.0	13.2	5.0	3,070,122	4,017,838	3,769,581
2.22 .	2,454,591	2,547,854	1,129,381	11.4	13.4	6.6	6,195,618	7,295,948	6,513,179
3.21 .	269,527	420,117	243,824	7.1	13.0	8.4	1,040,641	1,240,932	1,054,421
EAST INDIA									
Bihar	3,697,828	3,971,880	3,378,943	9.6	11.5	10.9	8,371,213	10,503,937	10,542,504
2.12 .	1,462,171	1,556,477	1,118,007	8.4	9.8	7.7	3,799,344	4,981,745	4,855,322
2.13 .	1,325,576	1,339,947	979,389	12.6	14.6	12.2	2,512,912	3,067,919	3,027,774
3.31 .	910,081	1,075,456	1,281,547	8.7	11.4	15.6	2,058,957	2,454,273	2,659,408
Orissa	877,958	1,276,932	1,332,470	6.2	9.7	11.3	2,186,248	2,604,118	2,456,134
3.33 .	610,530	843,322	892,203	8.0	12.2	14.7	460,480	454,995	389,213
5.11 .	267,428	433,610	440,267	4.1	7.0	7.7	1,725,768	2,149,123	2,066,921
West Bengal	2,973,013	4,173,868	1,262,590	12.7	21.1	7.4	4,647,359	5,256,685	4,714,056
1.25 .	168,043	213,232	80,388	8.6	12.1	5.0	338,187	366,772	302,963
2.11 .	2,816,595	3,971,658	1,184,041	13.1	22.0	7.7	4,309,172	4,889,913	4,411,093
Assam	1,450,670	1,248,581	1,027,866	17.4	17.9	17.6	...	...	...
1.21 .	1,313,710	1,026,104	905,071	18.4	17.2	18.1	1,203,773	1,528,704	1,357,043
1.22 .	136,960	222,477	122,795	11.7	22.5	15.0	...	...	...
1.23 .	65,566	66,463	61,590	12.0	13.9	14.9	...	...	...
1.24 .	126,019	130,560	78,013	21.9	29.2	22.7	...	...	...
1.26 .	16,205	11,712	28,087	12.5	10.1	29.3	...	...	...
SOUTH INDIA									
Madras	7,185,253	5,181,266	4,056,961	13.4	11.0	9.5	16,430,283	16,401,025	13,613,507
3.54 .	555,554	438,074	377,420	11.7	10.3	9.8	1,575,666	1,642,748	1,376,444
4.23 .	1,157,912	587,375	603,235	18.6	10.9	12.6	1,951,278	1,879,531	1,710,808
5.12 .	1,692,086	1,323,303	1,234,561	12.5	11.0	11.4	4,143,616	4,189,108	3,339,662
5.21 .	3,779,701	2,832,514	1,841,745	13.1	11.1	7.9	8,759,723	8,689,638	7,186,593
3.53 .	1,737,154	771,654	578,585	21.2	11.1	9.2	1,326,771	1,366,899	1,125,462
4.24 .	1,780,368	1,192,302	1,316,695	21.2	17.3	23.3	1,698,711	1,357,609	958,264
4.25 .	60,679	5,399	-511	30.5	3.3	-0.3	34,140	39,938	36,818

NOTE 1.—The Mean Decennial Growth Rate (Cols. 11, 12 and 13) and the Migration-cum-Statistical Error (Cols. 29, 30 and 31) which are shown in this table within brackets for India and Zones refer to areas of categories A and B defined in sub-para 2 and 3 of para 5 of the note on Birth rates and Death rates.

three decades—General Population

State and Division	Growth of Population during decade			Mean decennial growth Rate			Registered Births during decade		
	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30
I	8	9	10	11	12	13	14	15	16
WEST INDIA									
Bombay	6,775,004	3,938,471	2,889,466	20·8	14·5	12·1	7,341,581	7,816,171	6,603,769
3·43	2,305,128	1,247,214	1,343,898	20·6	13·2	16·5	3,105,621	3,403,625	2,893,391
3·52	697,340	421,972	320,409	16·0	11·1	9·4	1,330,504	1,242,727	1,092,468
4·11	1,888,817	1,600,340	861,205	18·1	18·4	11·5	1,335,099	1,666,718	1,315,632
4·21	1,144,102	392,653	8,358	50·5	26·2	0·6	523,190	380,164	244,472
4·22	739,617	276,292	355,596	17·3	7·3	10·3	1,047,167	1,122,937	1,057,806
4·12	576,659	606,824	396,341	15·0	18·6	14·4	...	...	...
4·13	59,726	-12,616	35,949	11·1	-2·5	7·2	...	...	...
CENTRAL INDIA									
Madhya Pradesh	1,615,918	1,839,719	1,995,614	7·9	9·8	11·9	6,446,177	6,608,830	6,008,081
3·24	328,725	442,513	409,410	6·2	9·0	9·1	1,955,555	2,150,801	1,853,715
3·32	913,615	1,111,174	1,019,584	9·4	12·7	13·3	2,372,883	2,384,923	2,131,825
3·41	373,578	286,032	566,620	7·0	5·7	12·3	2,117,739	2,073,106	2,022,541
Madhya Bharat	784,274	872,019	669,709	10·4	12·9	11·2	...	...	...
2·35	173,388	209,265	119,817	10·8	14·8	9·6	...	...	...
3·13	463,503	481,481	377,433	10·6	12·3	10·8	...	...	...
3·14	147,383	181,273	172,459	9·4	12·9	14·0	...	...	...
Hyderabad	2,327,989	1,898,949*	1,970,449*	13·3	12·3	14·7	...	...	...
3·42	562,204	562,916	705,437	9·9	11·0	15·8	...	...	...
3·51	1,765,785	1,327,793	1,256,796	14·9	12·9	14·0	...	...	...
3·22	208,041	399,097	249,205	6·0	12·6	8·8	...	...	...
3·23	57,851	54,629	38,334	7·2	7·3	5·4	...	...	...
NORTH-WEST INDIA									
Rajasthan	1,984,565	2,041,932	1,396,212	13·9	16·6	13·2	...	...	...
2·34	842,926	744,170	456,441	13·7	13·9	9·6	...	...	...
2·41	669,087	794,079	569,655	15·7	22·4	19·9	...	...	...
3·11	308,729	263,693	211,946	15·9	16·0	15·0	...	...	...
3·12	163,823	239,990	158,170	8·5	13·9	10·4	...	...	...
Punjab	-57,398	1,925,448	987,936	-0·5	16·4	9·6	4,997,531	5,052,481	4,183,065
1·13	59,495	98,581	26,590	6·2	11·3	3·3	327,433	318,658	286,384
2·31	-116,893	1,826,867	961,346	-1·0	16·8	10·2	4,670,098	4,733,823	3,896,681
1·12	51,755	103,435	64,230	4·8	10·3	+7·0	35,994	30,014	...
2·32	91,099	508,865	213,931	2·6	16·2	7·7	...	...	...
2·33	826,133	281,693	147,794	62·0	36·2	26·2	398,410	299,037	217,661
2·36	109,679	76,729	60,122	17·2	14·1	12·6	184,532	204,748	160,312

* The adjustment on account of the transfer of a number of villages has been made in Hyderabad State. total, therefore, it does not tally with the division totals where no similar adjustments could be made.

ANNEXURE

Mean decennial growth rate during

State and Division	Mean decennial birth rate (Registered)			Registered deaths during decade			Mean decennial death rate (Registered)		
	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30
I	17	18	19	20	21	22	23	24	25
INDIA	27.2	33.8	33.7	48,597,377	51,206,579	50,245,842	19.4	23.0	25.3
North India	24.8	34.2	34.0	9,664,105	11,333,226	11,993,248	16.5	21.9	25.6
East India	21.7	29.8	32.5	13,260,931	14,458,803	14,859,500	17.5	21.7	25.3
South India	28.8	32.8	30.1	11,994,657	11,586,869	10,443,465	19.4	21.3	21.3
West India	32.9	37.2	35.9	5,038,376	5,275,109	4,912,309	22.6	25.1	26.7
Central India	37.0	41.2	41.4	5,287,720	5,115,188	4,611,449	30.3	31.9	31.8
North-West India	38.2	42.5	40.3	3,351,588	3,437,384	3,425,871	23.0	26.3	30.3
<i>Andaman and Nicobar Islands</i>	...	...	...	...	...	...	...	...	...
NORTH INDIA									
Uttar Pradesh	24.8	34.2	34.0	9,664,105	11,333,226	11,993,248	16.5	21.9	25.6
1.11	29.3	36.5	34.7	381,278	426,498	430,996	19.3	24.6	27.5
2.14	21.8	30.4	30.0	2,526,415	2,846,158	3,005,366	15.3	19.3	22.3
2.21	20.2	30.0	30.8	2,103,872	2,634,496	2,891,645	13.8	19.6	23.7
2.22	29.5	39.3	38.9	3,929,398	4,652,027	4,845,841	18.7	25.1	28.9
3.21	27.6	38.3	36.2	723,142	774,047	819,400	19.2	23.9	28.1
EAST INDIA									
Bihar	21.9	30.6	34.3	6,139,423	7,362,275	7,499,151	16.1	21.4	24.4
2.12	21.8	31.3	33.3	3,087,306	3,506,041	3,603,771	17.7	22.0	24.7
2.13	23.9	33.4	37.7	1,821,313	2,121,114	2,246,115	17.3	23.1	28.0
3.31	20.2	26.6	33.0	1,230,804	1,735,120	1,649,265	12.1	18.8	20.4
Orissa	28.2	35.7	37.3	2,017,370	2,069,927	2,030,427	26.0	28.4	30.8
3.33	24.7	27.1	29.2	376,467	331,527	267,262	20.2	19.8	20.1
5.11	29.3	38.3	39.4	1,640,903	1,738,400	1,763,165	27.9	31.0	33.6
West Bengal	20.5	27.5	28.7	4,292,221	3,996,988	4,287,236	18.9	20.9	26.1
1.25	26.2	32.2	29.8	313,637	299,169	279,330	24.3	26.2	27.4
2.11	20.2	27.2	28.6	3,978,584	3,697,819	4,007,906	18.6	20.6	26.0
Assam	...	...	...	...	...	...	...	...	...
1.21	16.8	25.6	27.1	811,917	1,029,613	1,042,686	11.4	17.2	20.8
1.22	...	...	...	...	...	...	...	...	...
1.23	...	...	...	...	...	...	...	...	...
1.24	...	...	...	...	...	...	...	...	...
1.26	...	...	...	...	...	...	...	...	...
SOUTH INDIA									
Madras	30.8	34.7	31.9	11,015,377	10,512,272	9,431,588	20.6	22.3	22.1
3.54	33.1	38.5	35.7	1,082,344	1,111,996	990,797	22.7	26.1	25.7
4.23	31.3	35.0	35.8	1,141,176	1,105,590	1,060,249	18.3	20.6	22.2
5.12	30.5	34.7	30.9	2,809,869	2,703,746	2,295,336	20.7	22.4	21.3
5.21	30.4	34.0	31.0	5,981,988	5,590,940	5,085,206	20.7	21.9	21.9
3.53	16.2	19.7	17.9	950,763	1,035,819	961,100	11.6	14.9	15.3
4.24	20.3	19.7	17.0	786,973	752,906	544,851	9.4	10.9	9.7
4.25	17.2	24.1	22.5	28,517	38,778	50,777	14.3	23.4	31.0

I

three decades—General Population

State and Division	Mean decennial birth rate (Registered)			Registered deaths during decade			Mean decennial death rate (Registered)		
	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30
I	17	18	19	20	21	22	23	24	25
WEST INDIA									
Bombay	32·9	37·2	35·9	5,038,376	5,275,109	4,912,309	22·6	25·1	26·7
3·43	35·3	39·5	38·9	2,144,667	2,243,327	2,055,726	24·4	26·0	27·7
3·52	36·0	38·5	37·4	905,457	849,408	794,588	24·5	26·3	27·2
4·11	36·2	38·9	36·2	912,657	1,141,646	969,407	24·8	26·6	26·7
4·21	23·1	25·4	18·8	363,410	316,242	365,409	16·0	21·1	28·1
4·22	27·0	33·0	33·9	712,185	724,486	727,179	18·3	21·3	23·3
4·12	...	...	...	...	...	...	...	...	...
4·13	...	...	...	...	...	...	...	...	...
CENTRAL INDIA									
Madhya Pradesh	37·0	41·2	41·4	5,287,720	5,115,188	4,611,449	30·3	31·9	31·8
3·24	36·8	43·7	41·2	1,670,193	1,725,575	1,462,604	31·5	35·0	32·5
3·32	35·2	39·2	39·4	1,893,441	1,693,715	1,612,927	28·1	27·8	29·8
3·41	39·4	41·1	43·8	1,724,086	1,695,898	1,535,918	32·1	33·6	33·3
Madhya Bharat	...	...	...	...	...	...	...	...	...
2·35	...	...	...	...	...	...	...	...	...
3·13	...	...	...	...	...	...	...	...	...
3·14	...	...	...	...	...	...	...	...	...
Hyderabad	...	...	...	...	...	...	...	...	...
3·42	...	...	...	...	...	...	...	...	...
3·51	...	...	...	...	...	...	...	...	...
3·22	...	...	...	...	...	...	...	...	...
3·23	...	...	...	...	...	...	...	...	...
NORTH-WEST INDIA									
Rajasthan	...	...	...	...	...	...	...	...	...
2·34	...	...	...	...	...	...	...	...	...
2·41	...	...	...	...	...	...	...	...	...
3·11	...	...	...	...	...	...	...	...	...
3·12	...	...	...	...	...	...	...	...	...
Punjab	39·5	43·0	40·6	3,025,595	3,097,916	3,129,378	23·9	26·3	30·4
1·13	34·1	35·8	34·7	228,579	239,615	259,109	23·8	26·9	31·4
2·31	40·0	43·6	41·2	2,797,016	2,858,301	2,870,269	23·9	26·3	30·3
1·12	30·4	28·4	...	23,073	23,674	...	19·5	22·4	...
2·32	...	...	...	...	...	...	...	...	...
2·33	29·9	38·5	38·7	188,560	174,577	164,529	14·1	22·5	29·2
2·36	28·9	37·5	33·6	137,433	164,891	131,964	21·5	30·2	27·7

ANNEXURE,

Mean decennial growth rate during

State and Division	Decennial rate of Natural increase (Registered)			Migration-Cum-Statistical error		
	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30
	26	27	28	29	30	31
INDIA	7.8	10.8	8.4	4.7 (4.6)	2.5 (2.2)	2.0 (1.2)
North India	8.3	12.3	8.4	2.9 (2.9)	0.4 (0.5)	-1.9 (-1.9)
East India	4.2	8.1	7.2	6.6 (6.6)	6.3 (6.2)	3.6 (3.2)
South India	9.4	11.5	8.8	5.9 (5.1)	0.2 (-0.5)	2.1 (0.6)
West India	10.3	12.1	9.2	9.8 (10.5)	2.5 (2.4)	3.1 (2.9)
Central India	6.7	9.3	9.6	3.3 (8.5)	2.0 (0.0)	2.8 (1.3)
North-West India	15.2	16.2	10.0	-6.2 (-9.2)	0.5 (1.3)	1.2 (0.6)
Andaman and Nicobar Islands	...	...	...	...	...	...
NORTH INDIA						
Uttar Pradesh	8.3	12.3	8.4	2.9	0.4	-1.9
1.11	10.0	11.9	7.2	1.6	0.9	0.8
2.14	6.5	11.1	7.7	4.5	0.2	-0.7
2.21	6.4	10.4	7.1	5.6	2.8	-2.1
2.22	10.8	14.2	10.0	0.6	-0.8	-3.4
3.21	8.4	14.4	8.1	-1.3	-1.4	0.3
EAST INDIA						
Bihar	5.8	9.2	9.9	3.8	2.3	1.0
2.12	4.1	9.3	8.6	4.3	0.5	-0.9
2.13	6.6	10.3	9.7	6.0	4.3	2.5
3.31	8.1	7.8	12.6	0.6	3.6	3.0
Orissa	2.2	7.3	6.5	4.0	2.4	4.8
3.33	4.5	7.3	9.1	3.5	4.9	5.6
5.11	1.4	7.3	5.8	2.7	-0.3	1.9
West Bengal	1.6	6.6	2.6	11.1	14.5	4.8
1.25	1.9	6.0	2.4	6.7	6.1	2.6
2.11	1.6	6.6	2.6	11.5	15.4	5.1
Assam	...	...	...	...	...	...
1.21	5.4	8.4	6.3	13.0	8.8	11.8
1.22	...	...	...	...	...	...
1.23	...	...	...	...	...	...
1.24	...	...	...	...	...	...
1.26	...	...	...	...	...	...
SOUTH INDIA						
Madras	10.2	12.4	9.8	3.2	-1.4	-0.3
3.54	10.4	12.4	10.0	1.3	-2.1	-0.2
4.23	13.0	14.4	13.6	5.6	-3.5	-1.0
5.12	9.8	12.3	9.6	2.7	-1.3	1.8
5.21	9.7	12.1	9.1	3.4	-1.0	-1.2
3.53	4.6	4.8	2.6	16.6	6.3	6.6
4.24	10.9	8.8	7.3	10.3	8.5	16.0
4.25	2.9	0.7	-8.5	17.6	2.6	8.2

I

three decades—General Population

State and Division	Decennial rate of Natural increase (Registered)			Migration-Cum-Statistical error		
	1941-50	1931-40	1921-30	1941-50	1931-40	1921-30
I	26	27	28	29	30	31
WEST INDIA						
Bombay	10.3	12.1	9.2	10.5	2.4	2.9
3.43	10.9	13.5	11.2	9.7	-0.3	5.3
3.52	11.5	12.2	10.2	4.5	-1.1	-0.8
4.11	11.4	12.3	9.5	6.7	6.1	2.0
4.21	7.1	4.3	-9.3	43.4	21.9	9.9
4.22	8.7	11.7	10.6	8.6	-4.4	-0.3
4.12	...	...	...	...	...	...
4.13	...	...	...	...	...	...
CENTRAL INDIA						
Madhya Pradesh	6.7	9.3	9.6	0.5*	0.0*	1.3*
3.24	5.3	8.7	8.7	0.8*	0.3*	0.3*
3.32	7.1	11.4	9.6	1.1*	1.1*	1.6*
3.41	7.3	7.5	10.5	-0.3	-1.8	1.8
Madhya Bharat	...	...	...	...	...	...
2.35	...	...	...	...	...	...
3.13	...	...	...	...	...	...
3.14	...	...	...	...	...	...
Hyderabad]	...	...	...	...	...	...
3.42	...	...	...	...	...	...
3.51	...	...	...	...	...	...
3.22	...	...	...	...	...	...
3.23	...	...	...	...	...	...
NORTH-WEST INDIA						
Rajasthan	...	...	...	...	...	...
2.34	...	...	...	...	...	...
2.41	...	...	...	...	...	...
3.11	...	...	...	...	...	...
3.12	...	...	...	...	...	...
Punjab	15.6	16.7	10.2	-16.1	-0.3	-0.6
1.13	10.3	8.9	3.3	-4.1	2.4	0.0
2.31	16.1	17.3	10.9	-17.1	-0.5	-0.7
1.12	10.9	6.0	...	-6.1	4.3	...
2.32	...	...	...	...	...	...
2.33	15.8	16.0	9.5	46.2	20.2	16.7
2.36	7.4	7.3	5.9	9.8	6.8	6.7

*The figures have been worked out by substituting the mean decennial growth rate of the population of the area under registration instead of figures relating to total area given in Cols. 11-13.

ANNEXURE II

PART I

Computed Birth and Death Rates in India during 1941-50 by Shri S. P. Jain, M.Sc., F.I.A., F.S.S., Census Actuary

In this note an attempt has been made to estimate from the Census data the levels of birth and death rates in the various States obtained during the last intercensal period 1941-50. Birth and death rates are linked with each other through the rates of growth and migration, of which the former is reliably given by the last Census. There is usually some uncertainty about the migration data but this time it is particularly worse because of the relevant data for 1941 not having been tabulated, large scale migration following Partition and division and integration of States that took place during the decade. Migration factor has generally been ignored in Indian demographic studies of this kind, as its effect is considered to be trivial. However, from the discussions that follow it would appear that for a proper study this element is not so negligible. Its effect on the finally computed birth and death rates may be by quite a few points, which make all the difference in regard to the estimates conforming to certain other information in the matter. In this note, migration factor as affecting population growth has been tackled even though with imperfect data. The estimates have been made by two independent methods. By the first method, which may be called the 'differencing' method, a direct estimate of death rate has been obtained, and the corresponding birth rate deduced therefrom. In such deductions, the problem has been to split up on the available data the observed growth rate into rate of natural increase based on excess of births over deaths and rate of migration gain or loss. Mr. Hardy in his Actuarial Report for 1901 seems to have made the first attempt to estimate the levels of birth and death rates in important States by this method, ignoring the migration element. A similar calculation has been made by Mr. Porter in respect of Bengal in 1931 Census Report for the

province. By the second method, which has come to be known as the 'Reverse Survival' method, a direct estimate of birth rate has been made. Considering the very good agreement between the estimate of birth rate by this method and that deduced by the first method, it is not necessary to deduce the corresponding death rate. It may be stated that the final estimates of birth and death rates obtained in this study are given in columns 6 and 7 of Table I. Estimates of birth rates in 1950 based on the infants enumerated in 1951 Census are discussed in Part II of the note. In para (7), the evidence for the extent of omission in birth and death registration is presented and in para (8) the trend in birth and death rates for the last fifty years is reviewed. Kingsley Davis has given in his book 'The Population of India and Pakistan' valuable material on these topics and it has been considered in this note in the light of the results obtained here.

(2) Census data can be used to estimate levels of birth and death rates in the various parts of the country. In essentials, the problem is to break up an observed intercensal increase in the population into its various components; for confining attention to the intercensal period, we have

Population increase

$$\begin{aligned}
 &= \text{Births (B)} - \text{Deaths (D)} \\
 &+ \text{Fresh Immigration (FI)} \\
 &- \text{Fresh Emigration (FE)} \dots \dots \dots (A)
 \end{aligned}$$

Here, population increase is the difference between the enumerated population at the two Censuses. Our knowledge of fresh immigration and emigration in India is derived from birth place statistics collected during the Censuses. In the Census children of immigrants or emigrants born

at the place of migration are recorded as the native population of the place. Thus, it is implied in the above relationship that births among immigrants are to be included in B and not in FI. This conforms to the registration practice of recording births by place of occurrence, under which births among immigrants will go to increase the number of registered births in the place. Similarly, deaths are reckoned by place of occurrence, and hence deaths among immigrants are included in D. Thus, FI represents fresh immigration without including subsequent births and deaths in the migrating group. The same is true of FE. Births and deaths among them do not enter in the above relationship directly. Of course, in the calculation of FI or FE by the method of tracing change in birth place statistics recorded at two points of time, allowance will have to be made for changes due to deaths in the migrant group, but this is another matter. The terms on both the sides of the above relationship may be divided by the mean population during the intercensal period. The mean population may be estimated in a simple manner by taking the average of the enumerated populations at the two Censuses. We get the following relationship in terms of rates :—

Mean Decennial Population Growth Rate.

$$\begin{aligned} &= \text{Birth Rate} - \text{Death Rate.} \\ &+ \text{Fresh Migration Rate} \dots \dots \dots (B). \end{aligned}$$

where the exact significance of the various rates involved here is in accordance with the explanations indicated above. In the application of this relationship to the Indian data for 1941 and 1951 Censuses, certain special points of details arise in view of the large scale migratory movement following partition, division and integration of States and the fact that birth place statistics were not compiled in 1941. These will be taken up in their proper places, but it may be remarked here that the birth and death rates computed from the above relationship would have been obtained more reliably and with less labour had these special disturbing factors not been present.

(3) — Calculations by 'Differencing' Method.

(3.1) *Mean Population.* — In 1951 Census, displaced immigrants coming to India in the wake of partition were enumerated separately and for convenience, unless mentioned otherwise,

throughout these calculations 1951 population has been taken exclusive of displaced persons. This procedure resolves to a large extent the complications arising out of an unusual migratory movement but the problems due to emigrating Muslims are still left. This Muslim emigration is taken in the calculations along with normal emigration. It may be noticed that the Mean Decennial Growth Rate referred to, in para. 2 is different from that shown in Census of India Paper No. 1—1952 in that the former excludes displaced persons.

(3.2) *Death Rate.* — As would be clear from the above discussion, deaths as required here should include (a) deaths in 1941 population (b) deaths among the births during the intercensal period and (c) deaths among fresh immigrants. But for the disturbing factor of migration, deaths under head (a) can be simply obtained. The survivors of 1941 population are enumerated as population aged 10 and over and, therefore, the difference between 1941 total population and 1951 population aged 10 and over gives the deaths under (a). The effect of migration is that survivors in 1951 of fresh immigration during the intercensal period reduce the difference and that survivors of fresh emigration increase it. Hence, to allow for migration, it is necessary to estimate in 1951 the numbers of surviving fresh immigrants and emigrants. This would involve making some assumption about the manner in which the streams of immigrants and emigrants moved and the mortality rates to be applied to them. There is very little data which can be helpful in fixing these assumptions. In order to avoid making such assumptions without any factual knowledge, it seems better to calculate death rate with reference to the natural population and to make the plausible assumption that the death rate in the natural population is the same as in the resident population. Usually in India migration is not of such a magnitude that the sex-age composition of the resident population is materially different from that of the natural population, by and large the bulk of the resident population consists of the natural population. It is, therefore, unlikely that the death rates in the two populations would differ appreciably. In the calculations death rate among the natural population was taken in equation B of para 2. The main merit of this approach is that natural population is depleted by mortality only. If the Census data are correct, an estimate of death rate unaffected by any other extraneous factor is

directly obtained. Thus, we have now to estimate deaths in the natural population under heads (a) and (b) only.

(3.21) Natural population at the Census time is easily obtained by adding emigrants to and subtracting immigrants from the enumerated population. The difference between 1941 total population and 1951 population in the age sector 10 and over gives deaths under head (a). This difference is nearly equal to deaths at ages 5 and over in the natural population which is changing in composition due to births and deaths only. The difference, referred to, here, includes deaths below age 5 in 1941 population. Such deaths took place within the next 5 years of 1941, as persons below age 5 after this period were survivors of births after 1941, and not of 1941 population. Further, the difference excludes deaths above age 5 among the births of the intercensal period. Such deaths were obviously at ages 5-10 and from amongst survivors of births during the next five years after 1941 but had nothing to do with 1941 population. Subject to an adjustment for these inclusion and exclusion the difference is *exactly* equal to deaths at ages 5 and over. Mortality in the first five years of life is much heavier than in the following five years, and, therefore, the inclusion is more than the exclusion except in a possible though unusual case when the births during the next five years after 1941 may be abnormally high. Thus, generally speaking, the difference should be slightly in excess of the deaths at ages 5 and over in the natural population. It is possible to make an estimate of this excess as explained in paragraph (3.24). Calculations in an actual case showed that the excess is well within 5%. For practical purposes the excess may be ignored, as the labour involved in making the necessary calculations for adjusting for the excess is not worth the result. The refinement loses its importance in the face of a much broader assumption that has to be made for estimating total deaths in the community. Actual registration data of deaths by ages gives the ratio of deaths above age 5 to the total deaths recorded. This ratio may be applied to the difference to arrive at the total deaths in the natural population. Vital statistics are defective but the ratio based on them may be good enough for practical purposes. Strictly speaking, percentage omission in the registration of deaths below age 5 is likely to be

relatively more than that for deaths in the remaining span of life and for this reason, the ratio as obtained from the registration data is likely to be an under-estimate. This factor may go to minimise the effects of ignoring the excess referred to earlier in this para. Thus, the total deaths under heads (a) and (b) calculated as above when divided by the mean natural population give mean death rate during the period 1941-50.

(3.220) Certain points of detail with regard to emigrants and immigrants enumerated at the Censuses may now be taken up. Firstly, the proportion of persons below age 10 in the migrant population is likely to be small enough and it would not appear to be incorrect to treat practically all the migrant population as above age 10, since as already stated births among them are not included in the migrant group.

(3.221) Allowance has to be made for Muslim migrants from India to Pakistan after partition. Their number is not yet available from the Indian and Pakistan Census data. Perhaps it may be possible to get some firm figures from the Pakistan Census at a later date. For the present their number has been estimated by the Census Superintendents. Here we are concerned with their survivors at the time of 1951 Census. Since the number of Muslim emigrants itself is a broad estimate, refinements are out of place, and hence the survivors are taken at 90% of the estimated figure of Muslim emigrants. It may be worth mentioning here that Muslim emigration was very heavy in Punjab and PEPSU only. In fact, in these States, the pre-partition composition of the population has been thoroughly changed. Delhi also had a considerably high number of Muslim emigrants. Other areas from which emigration of Muslims was of some considerable magnitude are U. P., Bihar, West Bengal, Assam, Rajasthan and Ajmer. Certain States like Madras, Travancore-Cochin, Mysore, Vindhya Pradesh and Orissa were practically unaffected by this movement.

(3.222) Another point is the estimation of migrant population as at 1941 Census. Here the relevant censal figures relating to migrants are available for 1931, and next for 1951. The figures for 1941, have, therefore, to be estimated from those for 1931 and 1951. The abnormal migration following partition has already been considered and hence can be ignored in this

context. Certain developments which are peculiar to the period complicate a reliable estimation of migrant population in 1941. Since 1931 the boundaries of States have changed. The first instalment of major changes in the boundaries took place round the year 1936. Sind was separated from Bombay, Bihar and Orissa were formed into distinct provinces which involved carving out certain areas from C. P., Bihar, Orissa and Madras. The next major alteration in the boundaries of States was effected during the period 1947 to 1950. Punjab, Bengal and Assam were partitioned, and integration of States in other areas took place. Practically every State has thus been affected if not by a major operation, at least by the comparatively minor event of mergers. It is unnecessary to go into the details here, but it would suffice to say that a consideration of the magnitude of these changes would bring home the difficulties of estimating 1941, or as a matter of that, even 1931 migrant population corresponding to 1951 layout of States. Somehow 1931 migrant population for 1951 layout of States was pieced together from the data given in 1931 Census Reports, but there is a big snag in this procedure, which can be well illustrated by the example of Bengal. In 1931 Census persons born in East Bengal and enumerated in West Bengal and *vice versa* were treated as non-migrants but in 1951 Census they appear as migrants. There are no available data for correcting the figures for this change. Similar remarks apply to other areas partitioned since 1931 such as Bihar and Orissa, Bombay and Sind and so on. Apart from this there is the further problem of estimating the migrant population of the two partitioned portions. In 1921 Census Reports immigration and emigration figures are available in their breakdown by districts but not so in 1931 Reports, as this healthy practice was discontinued. In the circumstances, the migration figures for the combined State were split up in the ratio of the corresponding migrant population of the two areas as shown in 1921 Report. Thus, estimates of the migrant populations in 1931 for the two partitioned areas were obtained. There is yet another minor development which, to some extent, has affected the comparability of 1951 and 1931 migration data. In 1931 Census counting was one night affair on a *de facto* basis but in 1951 the Census counting was spread over 20 days. In 1931 Census a person who may have gone over to another place for a few days was enumerated wherever he was found to be on the Census night.

and thus treated as a migrant, whereas in 1951 he was more likely to be relegated to his normal place of residence, which in majority of cases would be his birth place also, and thus counted as a non-migrant. However, it seems improbable that this factor has much weight in affecting the final figures of migration, as losses and gains may more or less balance out.

(3.223) Having obtained 1931 migration figures for 1951 layout, the next hurdle is to fix the figures for 1941. There is hardly any objective data for allocating between the two decades the increase or decrease in the migrant population of a State during 1931-50. In 1941 for a few States, *viz.*, Bombay, Bihar, Orissa and Madhya Pradesh only figures of enumerated persons born outside the State were tabulated on about 1% sample basis, but the figures of immigration thus brought out for the State as a whole do not appear to be satisfactory. This is glaringly shown by the data for Madhya Pradesh, where they show practically no immigration. This information for Madhya Pradesh was ignored. This tabulation in the case of Ajmer, Delhi, Mysore, Travancore-Cochin and Hyderabad only was made for the complete count. Immigration figure for 1941 where thus available was adopted, even though it is not considered to be satisfactory, and without its emigration counterpart is not of much help. Thus, the allocation referred to above where it became necessary was made on the advice of the State Census Superintendents, who carefully considered the possibilities of any special openings for immigration to and emigration from the State having occurred during 1931-50 to justify a departure from fifty-fifty allocation based on a steady flow of migration. On such advice 60% of the change in emigrant population shown by 1951 and 1931 Census figures for Bombay State is taken to have occurred during 1941-50. In the case of Madras the ratio of allocation is 57.5%, for Assam it is 59%, for Saurashtra it is 60%, for Punjab it is 60% in the case of immigration and 50% in the case of emigration. In other cases, 1941 figures were taken to be mean of those for 1931 and 1951. In the case of Madras there is yet another difficulty due to the fact that a very large proportion of her emigrants have gone over to outside countries like Ceylon, Singapore, Malaya, Thailand, Indonesia, Burma, etc. The number of such emigrants, being not known, has been estimated at 1,692,800 in 1951 on certain

rough and ready bases as against a figure of 1,032,000 in 1931. This estimate for 1951 is high enough to affect the resulting estimate of fresh migration during 1941-50 which is commented upon in paragraph (4.10).

(3.224) The above remarks on migration show how unsatisfactory the bases of estimating migration change during 1941-50 are. However, an attempt has been made as explained above to assess the correct position in a bad situation of paucity of data. In States where migration change is not material, the estimates have served well but where the change is substantial, certain contradictory results are obtained in some cases, which are discussed later in this note. This discussion here points to the need for a greater attention to the migration statistics in Indian Censuses. Any uncertainty about the migration factor leaves one guessing about the role of the other factors in the population prognosis. The comparatively small migration in the Indian population seems to be no justification for ignoring this very important factor, since it is essential to have some firm idea about its role in causing population changes. It is suggested that a proper plan for the routine collection of data in respect of immigration from and emigration to India may be evolved. Now that India has attained an independent status and it is necessary to take stock of the distribution of her people all over the world for various practical reasons also. Further, a comprehensive scheme may be worked out for the type of internal migration data which should be collected and tabulated at the Censuses.

(3.225) To summarise, the method for calculating death rate adopted here is as follows. The population aged 10 and over of a State as at 1951 Census is calculated by multiplying its total population (P_2) by the ratio (f) of 10% sample population aged 10 and over to the total sample population, which already excludes displaced persons. This is subtracted from the population (P_1) of the State as at 1941 Census. To this difference is added the algebraic excess of 1951 immigrants (I_2) over 1941 immigrants (I_1) and the algebraic excess of 1951 emigrants (E_2) over 1941 emigrants (E_1) is subtracted from the result. E_2 includes the survivors of Muslim emigrants on partition, reckoned at 90% of the estimated number of Muslims who went out. The result is taken to give the number of deaths

at ages 5 and over in the natural population of the State during 1941-50.

In symbols :

$$\begin{aligned} \text{Natural population at 1941 Census} &= N_1 \\ &= P_1 + E_1 - I_1 \end{aligned}$$

$$\begin{aligned} \text{Natural population at 1951 Census} &= N_2 \\ &= P_2 + E_2 - I_2 \end{aligned}$$

$$\begin{aligned} \text{Deaths at ages 5 and over} &= d \\ &= P_1 - fP_2 + (E_1 - I_1) - (E_2 - I_2) \\ &= P_1 - fP_2 + (I_2 - I_1) - (E_2 - E_1) \end{aligned}$$

It will be observed that $(I_2 - I_1) - (E_2 - E_1)$ stands for the change by 1951 Census time in the 1941 Census migrant population. This may in brief be referred to as "migration change" as distinct from fresh migration.

A small point of detail in the calculation of (f) arises from the fact that population aged 10 at the census is inflated by the preference for returning this age, while those enumerated at ages 9 and 11 are deflated. There is a similar preference for returning age as 8 and 12. A rough and ready assumption may be made that the enumerated population at age 10 is high largely because of the deflation at ages 9 and 11 arising out of some of them having returned their ages as 10. If so, the true population aged 10 may be taken roughly as $1/3$ of the population enumerated as aged 9 to 11. Half of the excess of the population enumerated as aged 10 over this one third may be taken as aged below 10. Thus, the ratio (f) may actually be obtained as the ratio of the sample population aged 10 and over less half the excess referred to here to the total sample population.

Total deaths in the natural population during 1941-50 are estimated by multiplying d by the ratio of the total deaths in the State to the deaths at ages 5 and over as given by the vital registration data for 1941-50. Dividing total deaths thus obtained by the mean natural population of the decade, i.e., $(N_1 + N_2)/2$ yields the mean death rate in the decade. For States for which data on registered deaths by ages are not available, the ratio for a State in the same Zone for which these data are available is used. This ratio from the registration record of Bihar, Orissa

Assam and West Bengal ranges between 1.40386 and 1.50468, whereas the figure based on the registration records of the other Part A States varies between 1.62530 and 1.84835. The low values in the former cases are considered to be due to the greater omission of deaths below age 5, as the final calculations show a comparatively much higher omission in registration of births and deaths in those States. Accordingly, in the cases of Bihar, Orissa, Assam and West Bengal, a ratio of 1.63654 based on the combined data relating to the remaining Part A States was adopted. The final effect of this adjustment may be seen from the fact that on the basis of the original ratio the death rates for Bihar, Orissa, Assam including Manipur and West Bengal in order worked out to 22.3, 26.7, 27.5 and 24.5 per mille as against 26.0, 29.0, 30.8 and 28.2 per mille respectively. In the calculation smaller States have been combined with the major units such as Manipur with Assam, Kutch with Saurashtra, Vindhya Pradesh and Bhopal with Madhya Bharat, Bilaspur and Himachal Pradesh with PEPSU.

(3.24) Before passing on to the next item the theoretical adjustment which should be made in taking the difference between 1941 population and 1951 population aged 10 and over as equal to deaths at ages 5 and over in the community as mentioned in para. (3.21) may be considered. Let M_x be the population between ages x and $x+1$ at 1941 Census and N_x be the population between ages x and $x+1$ at 1951 Census. From a life table applicable to the population, out of l_0 born the number l_x surviving to age x and the number l_x enumerated between ages x and $x+1$, can be obtained for estimating the relevant number of deaths. Of M_x persons, x being less than 5, the number surviving to age 5 is $l_5 \times \frac{M_x}{L_x}$. Thus the inclusion referred to in (3.21), viz. the number of deaths below age 5 in 1941 population is given by

$$\sum_0^4 M_x - l_5 \times \sum_0^4 \frac{M_x}{L_x}$$

Similarly, N_x Persons, x being greater than 5, are the survivors of $l_5 \times \frac{N_x}{L_x}$ persons who were aged 5. Thus, the exclusion referred to in (3.21), viz., the number of deaths between ages 5—10 among the intercensal births, whose sur-

vivors are enumerated between ages 5—10 at 1951 Census is given by

$$l_5 \sum_5^9 \frac{N_x}{L_x} - \sum_5^9 N_x$$

The difference of these two expressions gives an estimate of the excess which, as has been mentioned, is not considerable.

(3.3) *Fresh Migration Rate.* — Migration change during 1941-50 having already been estimated as explained above, it is only necessary to make an allowance for deaths among the migrant population during the period in order to arrive at an estimate of fresh migration in the intercensal period. In respect of Muslim migrants, the number initially emigrated is known and hence 10% of the number gives the number of deaths among them, as the survivors to 1951 Census date have been taken at 90% in the earlier calculations. In respect of normal migration, it would appear to be a reasonable assumption in the absence of any information to the contrary that the migrant population grew steadily from 1941 to 1951. Thus, the changing migrant population can be replaced by the mean migrant population at the mid-censal point. An overall death rate may be applied to this mean population to estimate deaths in this migrant population in the next 5 years. In the calculations the death rate was uniformly taken at 20 per thousand per annum except in the cases of States in the Central India Zone, where it was taken at 25 per thousand per annum. A convenient expression for calculating fresh immigration from migration change (M.C.) (ignoring Muslim Emigrants) and 1951 immigration (I_2) and emigration (E_2) figures, allowing for deaths at 20% during the decade, would be as follows: $(MC) + .20x(I_2 - E_2) - .20x \frac{1}{2}(MC) = .2(I_2 - E_2) + .9(MC)$. Fresh migration divided by the mean of 1941 population and 1951 population (excluding displaced persons) gives the fresh migration rate. The rate is taken as positive if there be a net immigration gain and negative if a net emigration loss.

(3.4) Death rate having been obtained directly, the corresponding birth rate is deduced with the help of relation (B) given in para. 2. Thus, in symbols, we have:

$$B.R. = G.R. + D.R. - F.M.R.$$

The results of the calculations are shown in the TABLE I Columns (6) and (7) show birth rates and death rates obtained by the method explained above. The rates which have

obtained on some other considerations are marked with asterisk.

TABLE I

It will be observed that for Madras, Travancore-Cochin, Bombay, Saurashtra and Punjab two sets of figures are given. The set of figures given in brackets are those obtained on the basis of the standard method explained above and the data furnished by the Census Superintendents. The other set of figures is obtained in a slightly different manner indicated in the next paragraph and is considered to be more appropriate. These rates have been taken into account in calculating the All-India birth rate and death rate.

(4) **Discussion of the results.**— It will be observed that computed death rates for Madras, Bombay and Punjab *viz.*, 19.1, 21.3 and 18.2, respectively are lower than the registered death rates which are 20.6, 22.6 and 23.9 respectively.

(4.10) In the case of Madras the registered deaths at ages 5 and over during 1941-50 are 6,687,300, whereas the difference between 1941 population and 1951 population aged 10 and over enumerated in Madras is 6,482,638. The value of the difference seems to be comparatively low, when it is considered that theoretically it should be higher still in view of the net emigration brought out by the available figures and the fact that the registered deaths do not cover the entire State. During 1941-50 there was no registration of births and deaths in certain small areas, *viz.*, Visakhapatnam and Srikakulam Agencies and the newly merged areas of Banganapalle, Sandur and Pudukkottai except for the period after 1949 when the births and deaths in the three merged States are included in the registration data. A low value of the difference may possibly arise due to (a) a comparatively more complete enumeration in 1951 Census and or, (b) a substantial fresh net immigration in place of net fresh emigration as brought out by the estimate of migration figures, which at the best is the result of an intelligent guess. As regards (a), while it is difficult to say how far this factor has been operative, it may be stated that a difference of $\frac{1}{2}$ % increase in efficiency of enumeration would make a difference of 2 lakhs nearly. This would, no doubt, raise the value of the difference but there would still be something left over to be explained on the basis of (b) as would be seen from the discussion below. As shown in (3.223) the number of emigrants from Madras outside the country in 1951 is estimated to be

higher than that in 1931. This does not seem to fit properly with the well-known fact that these foreign countries imposed severe restrictions on immigration and that a good proportion of emigrants to foreign countries had to return to Madras during 1941-50. A net immigration change seems more likely. Another factor which can account for the low value of the computed death rate is the ratio of total deaths to deaths at ages 5 and over according to registration records. For Madras, the ratio is 1.63553, whereas the highest value shown by any State is 1.84835. As is obvious the computed death rate varies directly with the value of the ratio. For instance, if the value of the ratio be 1.84835, the computed death rate would come out to be 21.6. It is difficult to make any objective assessment of the relative role of the various factors which could be responsible for a reduced value of the computed death rate. It is not unlikely that each one may be operating to some extent. In the present case, the evidence for the low value of the computed death rate being to a greater extent due to a miscalculation in migration is fairly strong and for the sake of presentation, the migration changes necessary to bring out different values of death rate have been worked out on the basis that only migration data are at fault. These figures are helpful in deciding the figure of death rate to be adopted. It is highly unlikely that the true death rate can be less than the registered rate of 20.7 per mille. For this rate, migration change should be a net immigration of 200,636 and the corresponding birth rate would then be 34.7 per mille. There is little doubt that there are some omissions in the registration of deaths. For 10% extra deaths on account of omission in registration, the true death rate would be 22.8 and true birth rate 35.0, if a net immigration change of 871,924 can be assumed. For 20% extra deaths, the true death rate would be 24.8 and true birth rate 36.5, if a net immigration change of 1,524,086 can be assumed. The size of immigration change required to support a large percentage of omission in deaths appears to be too high in the known circumstances. It seems that an assumption of 10% extra deaths, which agrees with the general belief in the matter is fairly reasonable. The corresponding birth and death rates have, therefore, been adopted for the State. A circumstantial evidence of the reasonableness of the assumption is given by the fact that the mean growth rates of the State during the last three intercensal periods are 9.5%,

TABLE I—Computed Birth

State	Mean Pop. excluding D. P. (in 000's)	Migration change	F.M.R.	G.R.
I	2	3	4	5
1. Uttar Pradesh	59,634	—394781	—1·01	10·4
2. Bihār	38,340	—910473	—2·95	9·5
3. Orissa	14,197	—331439	—1·30	6·0
4. West Bengal	22,800	—862719	—2·86	3·9
5. Assam including Manipur	8,725	—272834	—0·68	14·2
6. Madras	53,419	871924 (—312702)	0·55 (—1·45)	13·4 (13·4)
7. Mysore	8,203	190101	3·16	21·1
8. Travancore-Cochin.	8,390	172981 (—40294)	1·8 (—0·47)	21·2 (21·2)
9. Coorg	199	9869	10·41	30·5
10. Bombay	32,400	1005521 (408051)	3·77 2·10	19·9 (19·9)
11. Saurashtra including Kutch	4,351	—82987 —244606	—4·3 (—7·45)	13·0 (13·0)
12. Madhya Pradesh	20,383	—71695	—0·17	7·4
13. Madhya Bharat, Vindhya Pradesh and Bhopal	11,792	—54856	—0·39	8·1
14. Hyderabad	17,489	—20546	—0·29	13·3
15. Rajasthan	14,150	—332050	—3·37	11·9
16. Punjab	11,482	—3608662 (—4165799)	—36·1 (—39·58)	—21·2 (—21·2)
17. PEPSU, Bilaspur and Himachal Pradesh	4,351	—610981	—15·25	—5·0
18. Ajmer	603	—11103	—0·66	6·4
19. Delhi	1,083	...	16·0	30·5
ALL-INDIA	331,991	...	...	12·5

and Death Rates (1941-50)

D.R. (Differencing)	B.R.	B.R. (Reverse Survival)	B.R. (1950)	Registered B.R.	Registered D.R.
6	7	8	9	10	11
27.2	38.6	37.1	35.9	24.8	16.5
26.6	39.0	42.2	49.9	21.9	16.1
29.9	37.2	39.3	...	28.2	26.0
28.6	35.4	37.4† (35.3)	27.0	20.5	18.9
31.8	46.7	50.4† (49.8)	37.2	16.8	11.4
22.8* (19.1)	35.7 (34.0)	34.7	...	30.8	20.6
18.9	36.9	38.7	...	16.2	11.6
18.0* (13.7)	37.4 (35.4)	39.8	...	20.3	9.4
18.6	38.7*	38.7	...	17.2	14.3
24.9* (21.3)	41.0 (38.9)	41.8	...	32.9	22.6
24.9* (18.5)	42.2 (39.1)	42.4	...	...	...
38.5	46.1	45.1	39.9	37.0	30.3
35.8	44.2	44.3	...	...	...
29.5	43.1	47.2	...	...	...
27.2	42.5	47.9	...	...	...
26.3* (18.2)	41.2 (36.6)	37.6† (40.8)	39.5	39.5	23.9
31.3	41.5	36.6† (37.9)	...	...	...
38.0	45.0	46.8† (46.5)	...	28.9	21.5
26.3*	41.2	45.3† (41.1)	...	29.9	14.1
27.4	39.9	39.2	...	27.5	19.7

*Calculated on other bases explained in paras (4.10) to (4.13).

† Adjusted rates see para, (5.2) of the note.

11.0% and 13.4%. The registered birth and death rates in these periods are 31.9 & 22.1, 34.7 & 22.3 and 30.8 & 20.6 respectively. These give the rate of natural increase as 9.8, 12.4, and 10.2 respectively. These rates for 1921—30, and 1931—40 reasonably agree with the corresponding growth rates of the periods considering that Madras has been a net emigrating State. The conclusion may be made that registration system in the State has worked well during 1921—40. Even allowing for a possible deterioration in the registration system during 1941—50, it seems difficult to reconcile a growth rate of 13.4% with the registered rate of natural increase of 10.2% except on the basis of a net fresh immigration gain. The higher growth rate for 1941—50 can well justify a net fresh immigration of 0.55% involved in the assumption of a 10% extra deaths if the operation of factor (a) is entirely ignored. This note attempts at fixing of only the levels of birth and death rates. It is difficult to claim accuracy for any precise figures calculated as the migration data are not on the firm bases. It seems fairly well established that the level of birth rate in Madras is near about 35 per mille and the death rate a little above 20 per mille; A birth rate of 35 is brought out also by an independent calculation by the reverse survival method.

(4.11) A similar conflict as has been noticed in the case of Madras is shown by the data relating to Bombay. The registered deaths at ages 5 and over during 1941—50 are 3,127,145, whereas the difference between 1941 population and 1951 population aged 10 and over excluding displaced persons is 3,327,103. The comparatively small difference between the two figures requires an explanation, considering that there is a big chunk due to mergers for which deaths are not included in the registration figure, although such deaths are taken into account in the above difference figure. The size of the chunk may be seen from the fact that 1941 population of Bombay State for 1941 layout was 20,849,849 as against the corresponding figure of 29,181,146 for 1951 layout after mergers. It is unnecessary to go over the general considerations discussed with reference to Madras in the preceding paragraph; they apply here equally well. Coming to their application in the case of Bombay it is seen that an improvement by 1/2% in the efficiency of enumeration would make a difference of about 1½ lakhs. A net immigration change in 1951 shown by the

estimates of migration figures leading to a net fresh immigration of 2.1% seems to be out of tune with the mean decennial growth rates recorded by the State. The growth rates during the last three intercensal periods are 12.1%, 14.5% and 19.9% (excluding displaced persons.) The rate for 1941—50 is high and it seems improbable that it would have been so mainly due to higher survival of population through a very substantial lowering of death rate in the decade. The evidence for a substantial gain through net fresh immigration is strong when the registered birth and death rates are considered. The registered birth and death rates for the last three intercensal periods are 35.9 & 26.7, 37.2 & 25.1, and 32.9 & 22.6, giving the corresponding rates of natural increase as 9.2%, 12.1% and 10.3%. These percentages in 1921—30 and 1931—40 conform to the net immigrating position of the State. They also suggest a fairly good system of registration. On this basis, the big difference between population growth rate in 1941—50 (19.9%) and the rate of natural increase (10.3%) seems to point to a substantial net fresh immigration even if a deterioration in registration efficiency in 1941—50 is allowed for. On the assumption of a death rate equal to the registered rate (22.6), the migration change should be 623,706 leading to a net fresh immigration rate of 2.71% and a birth rate of 39.8. With 10% extra deaths, a death rate of 24.9 and birth rate of 41.0 is got involving net immigration change of 1,005,521 leading to a net fresh immigration rate of 3.77% during 1941—50. With extra deaths at 20% a death rate of 27.1 and birth rate of 42.2 is obtained, if it can be assumed that there was a net immigration change of 1,370,721 leading to a net fresh immigration rate of 4.78% during 1941—50. The rate of population growth in 1941—50 seems to justify a net immigration increase of 3.77% involved in assumption of 10% extra deaths. Accordingly, the birth rate of 41.0 and death rate of 24.9 are adopted for Bombay. The method of reverse survival gives a birth rate of 41.8. The computed death rate of 17.3 for Saurashtra and Kutch, a small unit, seems to be unacceptable when the death rate for Bombay is 24.9. Hence the death rate for Saurashtra as well as is taken as 24.9, which gives birth rate of 42.2. It requires a net fresh emigration rate of—4.3 as against, —7.45% brought out on the initial estimates of migration figures.

(4.12) The problem of Punjab seems to be complicated by the upheaval due to partition,

The number of Muslims emigrating is known to be large but the precise figure is not available, which makes any discussion on the lines adopted in (4.10) and (4.11) unhelpful. Accordingly, the true death rate has been taken to be 10% higher than the registered rate of 23.9. This gives a birth rate of 41.2 and a death rate of 26.3. Delhi a small State was seriously disturbed by the movement of population on partition. This makes the estimates of birth and death rates by the present method unreliable and hence Punjab rates have been assumed for Delhi also, and the corresponding figures of fresh migration rate has been worked out on the basis of the observed growth rate.

(4.13) The computed death rate for Travancore-Cochin seems to be unsatisfactory when compared to the death rate for Madras and Mysore. The registered death rate for Travancore-Cochin is incredibly low and affords no guidance for the calculation of the true rate. The death rate for the State has been taken to be below that for Madras and Mysore considering its slightly better health conditions. In the case of Travancore-Cochin the assumed death rate of 18 per mille requires a net fresh immigration rate of 1.8% against a net loss of -0.47% brought out on the estimates of migration figures by the Census Superintendent. The growth rates during the last three intercensal periods are 23.3%, 17.3% and 21.2%. The clue given by these figures as to the migration level is not clear. In support of a net fresh immigration gain during 1941-50 may be mentioned the return of a large number of war recruits who went out of the State immediately on the outbreak of war coupled with the industrial expansion during the decade. In this group the birth and death rates for Coorg, again a small State, which is easily affected by a small inaccuracy in the migration data, were determined by a different method. The birth rate adopted is based on the reverse survival method explained later and the death rate is derived from it with the observed growth rate and migration change based on estimated migration figures.

(4.14) The last four paragraphs describe the method of fixing a more reasonable figure for death rate or birth rate in cases where the one computed by the differencing method proved to be unsatisfactory in the light of other more reliable information. The units affected are small except those of Madras, Bombay,

and Punjab. The smallness of the units makes the computed rate liable to be considerably affected by any inaccuracy in the migration data. In the case of the three major States, the registration data are good enough to show up any appreciable effect of inaccuracy in the migration data or in other figures employed in the calculations of the computed rate. For the remaining States, registration data are so unsatisfactory that the effect due to any possible inaccuracy in migration data is insignificant compared to the registration deficiency and hence no conflict is reflected in the computations made here. The birth and death rates so determined for each State were applied to the mean population to determine births and deaths with a view to calculating births and deaths for All-India. The birth rate for India as a whole comes to 39.9 per mille and the death rate to 27.4 per mille. The rate of natural increase so brought out agrees with the observed mean decennial growth rate of 12.5%.

(5) Reverse Survival Method

(5.10) Birth rates shown in column 8 of table given in para (3.4) have been calculated independently on what is called the 'reverse survival' method. It is based on the fact that the population enumerated below 10 years of ages is the survivor of births in the inter-censal period. The Age Tables for 1951 in the column headed P_x give the required populations at individual ages below 10 for each State separately for male and female. In the terminology adopted in (3.24), N_x persons enumerated at age x are the survivors of $\frac{10}{L_x} \times N_x$ births. The factors 10 and L_x should be taken from a life-table applicable to the area concerned. For this purpose, the male and female life tables for 1941-50 are appropriate, if the limitations are borne in mind. In the first instance, N_0 persons enumerated in 1951 as aged 0-1 are the survivors of births in 1950 under the operation of mortality applicable to their group as prevalent in 1950, which may be different from the overall mortality experience of 1941-50 life table. Again N_1 persons aged 1-2 are the survivors of 1949 births after passing through the mortality of 1949 and 1950 as applicable to them. Similar remarks apply to N_x for other values of x . Child mortality is liable to considerable fluctuations and the differences from the overall experience may result in considerable differences in the estimates of births in the individual years.

However, the force of this limitation is considerably reduced if estimates of births in the intercensal period are combined. In the second place, life tables for each State are not available. North India Zone life tables relate to U.P. alone and are, therefore, entirely suitable for calculating births in U. P. The life tables for Eastern India Zone apply to Bihar, Orissa, and Assam taken together, and therefore, births estimated for these States on the basis of these tables do not take any account of the peculiar child mortality experience of each State. These tables are applied to West Bengal also and this extension is based on a plausible assumption of the applicability of the life tables to the case. Similar remarks apply to life tables for other Zones. In the South India Zone table the mortality experience of Madras predominates. In the West India Zone, the Bombay experience dominates. In East and Central India Zones no one State has a dominant position. There are no life tables for North-West India Zone. As an expedient North India Zone life tables have been applied to Punjab, PEPSU, Himachal Pradesh and Bilaspur and Delhi and Central India Zone life tables to the other States in the Zone. The All-India life tables have been applied to India as a whole. On the other hand, under-enumeration of children which is widely believed to be affecting the Indian Census data, may lead to an underestimate of births in the decade. Mis-statement of age is not such a seriously disturbing factor so long as the person is enumerated, but it should not be lost sight of. Child mortality particularly below age 5 changes so rapidly that a transfer of children from one age to another may make an appreciable difference. A clear appreciation of the above limitations would indicate that too much may not be seen in small differences in the calculated birth rates.

(5.11) The estimated births in 1941-50 calculated as above divided by the mean of the enumerated populations of 1941 and 1951, including displaced persons, give the mean birth rate for the decade. The birth rates so obtained are shown in column 8 of the table in para (3.4). The birth rate of 39.2 for All-India is unexpectedly close to the figure obtained by the earlier method. Similarly, the agreement in the estimates of birth rate by the two methods in the case of Bombay, Saurashtra, Madras, Madhya Bharat group and Madhya Pradesh is quite close. For

other States, the agreement is good enough but not so close. In the cases of Punjab and PEPSU group, the estimate by reverse survival is lower than that given in column (7) by 3.6 and 4.9 respectively. Bihar, Assam, Delhi, Hyderabad and Rajasthan show the largest differences of 3.2, 3.7, 4.1, 4.1 and 4.4 per mille respectively between the two estimates of their birth rates. Orissa, West Bengal and Travancore-Cochin are the other ones which show a considerable difference varying between 2 to 3 per mille. A higher estimate by 'reverse survival' may arise due to (a) an inflated enumeration of children below 10; this seems to have been a factor in certain States where the influx of displaced persons relative to its population size has been considerable and (b) the application of heavier mortality rates. These two factors are considered in the next paragraphs.

(5.12) Normal migration, if it is of a small order, as it generally is in the case of Indian States, does not deserve much consideration, but abnormal movement of the type following partition which affected certain areas particularly should be taken note of. Its effect on the estimate of children born and mean population may be considered separately.

(5.121) Normally migration below age 10 is not considerable but due to this movement which took place under duress, the number of children enumerated below 10 at 1951 Census may have been appreciably affected in certain cases. The bulk of this migration took place in the second half of 1947. According to Census practices, as already mentioned, children born in the State of enumeration to displaced persons were not counted as displaced persons and, therefore, there would be, if at all, few displaced children below age 3 in 1951 enumeration. Displaced children would occur in the age period 3-10. A similar problem in connection with Muslim emigration is not of much relevance, as these emigrants are not counted in 1951 population. This emigration generally took place on a family basis. The children as well the population to whom they were born emigrated *en bloc* and neither of these appears in the figures of children or population at 1951 Census. However, some small adjustment in the calculation of mean population is called for in as much as a section of Muslim emigrants was present in 1941 Census in the form of a group whose survivors formed this section. The States appreciably

affected by the influx of displaced persons are, Punjab, PEPSU group, West Bengal, Assam, Delhi & Ajmer. In the case of these States, 1951 Census gives the number of children enumerated between 0-4 and 5-9. A rough and ready estimate of births of which these children are survivors, may be obtained by multiplying the group populations by $\frac{I_0}{I_x}$, where x represents mean age of the group. Here, 0-4 would consist mainly of children aged between 3 and 4 and hence L_x may roughly be taken as the mean of L_3 and L_4 . For group 5-9, x may be taken as 7. Thus, a rough estimate of births relevant to displaced children may be obtained. This estimate may be subtracted to get the births in the decade undisturbed by the inclusion of displaced children below age 10.

(5.122) The adjustment in the mean population referred to in the preceding paragraph in connection with Muslim emigrants would in most cases be only a minor refinement for introducing which the necessary data are not available. Where the migratory movement compared to the total population was not of a high order, the adjustment would not affect the resultant birth rate materially. However, where the efflux relative to the size of the population was heavy such as in Punjab, PEPSU, etc., adjustments seem necessary. There is considerable uncertainty about the number of Muslim emigrants, and coupled with it is the fact that the data necessary to estimate the population of the group in 1941 whose survivors in 1947 emigrated will have to be based on guess work. In the circumstances refinements are out of place and it would appear to be good enough for the purpose of assessing the effect on computed birth rate, if the mean of 1941 and 1951 enumerated population is simply reduced by half the estimate of Muslim emigrants in order to take them out of calculation. A similar adjustment in the mean population on account of the immigration of displaced persons may also be considered. In taking mean population as the average of 1941 and 1951 populations, it is implied that the change of population from 1941 to 1951 took place at a uniform rate in the decade, so that the changing population can be replaced by a constant population existent throughout the decade. The constant population is taken as 1941 population to gether with half the final increase in the decade. Thus, by taking the mean population as the average of

1941 and 1951 enumerated populations, half the population of displaced persons (enumerated as at 1951 Census) is taken to have existed during the decade. Actually, the displaced immigrants came in the second half of 1947, and were in the State during 3 1/2 years on the average. Allowing for deaths at 25 per thousand of 1951 population of displaced persons, the original displaced immigrants may be taken as 1.088 of the enumerated number. The mean displaced population that existed for 3 1/2 years of the decade may therefore, be taken as equivalent to 1.044 ($3\frac{1}{2} \div 10$) i.e. .37 of 1951 enumeration figure existent throughout the decade. This is short of half the population taken into account by .13 or roughly by 1/8. Thus, a rough allowance for the migration following partition may be made by deducting 1/8 of the displaced population enumerated in 1951 Census from the average of 1941 and 1951 enumerated population in addition to the deduction of half the Muslim emigrants as already discussed.

(5.2) The birth rates for the particularly affected States revised on the basis of the rough adjustments explained in (5.121) and (5.122) are as follows; for the sake of comparison the birth rate by the differencing method is also shown.

TABLE 2
Reverse Survival

State	Unadjusted	Adjusted	Differencing
Punjab	37.6	40.8	41.2
PEPSU Group	36.6	37.9	41.5
West Bengal	37.4	35.3	35.4
Assam	50.4	49.8	46.7
Delhi	45.3	41.1	41.2
Ajmer	46.8	46.5	45.6

The adjustment has a substantial effect in the cases of Punjab, West Bengal and Delhi. It has little effect in the cases of Assam and Ajmer. The rates for Punjab and PEPSU group are raised because they suffered a net efflux due to migratory movement on partition. The rates for

West Bengal and Delhi are decreased because they had a net influx. The adjustment has yielded closely agreeing rates by the two methods for Punjab, West Bengal and Delhi. The difference in the case of *PEPSU*, and Assam is still considerable.

(5.22) The other factor of the application of heavier mortality may be responsible for the still unexplained differences. The other States in the Central India Zone have a death rate of about 35 as against a death rate of 27.5 for Hyderabad. This indicates that the Central India Zone life tables may be a little too heavy for Hyderabad and hence may lead to higher birth rate by the reverse survival method. The same explanation holds for Rajasthan. A similar explanation applies to the case of Travancore to which the higher mortality table of South Zone dominated by Madras has been applied. The low birth rate obtained for *PEPSU* seems to be due to the adoption of low mortality tables for U. P., which has a death rate of 26.5 as against 30.6 for the *PEPSU* group. The difference in the cases of Bihar, Orissa and Assam do not appear to be so easily explainable. The life tables for East India Zone applied in their cases are based on data relating to these areas. It may be recalled that the infant mortality rates required for obtaining the mortality rates for ages 0-5 for the life table are based on guess work. This evidence seems to point to the fact that East India Zone life table mortality rates for ages 0-5 may be a little too heavy for Bihar, Orissa and Assam. The precise figures show some difference but the levels of birth rates in the two States brought out by the two methods agree very well.

(6.0) It is a matter for great satisfaction that birth rates calculated by the two independent methods support each other so well. From the discussion in the preceding paragraphs, it would appear that the estimates of birth rates given in column 7 and hence of death rates in column 8 to which birth rates are tied up through the observed mean growth rate may be relied upon. The birth rate by reverse survival for All-India was obtained independently of the estimates for the States by the application of All-India life tables. Its agreement with the birth rate by the 'differencing' method deduced from the estimates of death rates for each State may be put forward as an indication of the soundness

of the All-India life-tables. In fact, the agreement of the two estimates for the States shows the soundness of the Zonal life tables.

(6.1) In Part II of the note an attempt has been made to estimate the birth rates for some States in the year preceding the Census from the number of enumerated infants. As a matter of interest those estimates are given in column (9) of Table I. These estimates relate to one year, and, in general, may have little relevance in the context of 1941-50 average rates. However, certain observations of a general nature seem possible. Except for Bihar, where the estimate has been noted to be abnormal, the birth rate obtained by this method is markedly below the other estimates shown in columns (7) and (8). This is so due to under-enumeration of infants, a factor to which attention has been drawn in that note. The best agreement is shown by U. P. and Punjab. Excepting Bihar the order in which the States are placed according to birth rates brought out by this method agree well with those obtained by the previous two methods. The main interest in the birth rates given in column 9 lies in the fact that the rates calculated by another independent method bring out the gross under-registration of births in certain States in a recent year.

(7) TABLE 3 given below shows the registered birth and death rates for the last three inter-censal periods, and the percentage of omissions in birth and death registration during 1941-50. The percentage expresses the ratio of the shortage of the registered rate to the corresponding rate given in column (6). The percentages obtained by Kingsley Davis by estimating births during 1926-30 by the method of reverse survival and comparing them with the registered births during the period are also shown.

Registration seems to be particularly bad in Assam. U. P., Bihar and West Bengal show high percentages. It is true that percentages of omission in death registration in Madras, Bombay and Punjab are comparatively low by assumption but the omission in birth rate brought out on this assumption seems to agree fairly well with Kingsley Davis's estimates in the cases of Madras and Bombay. Hence, the percentage of omission for death given for these States may not be wide off the mark. The very low figure of omission

for births shown for Punjab seems to be of doubtful significance. The population of Punjab in 1951 was less than what it was in 1941 due to migratory movement on partition. Upto 1947 the population was substantially higher than 1941 due to natural growth. It was abruptly depleted by migration on partition. The mean population obtained by taking the average of the registration area populations in 1941 and 1951, therefore, understates the population to which the registered births in the decade relate with the result that the birth rate derived therefrom is over-stated. This leads to a low figure of omission in births.

However, the position appears to be that registration system in the Punjab has worked fairly efficiently, and that the percentages of registration omission are not high. It is believed that the machinery broke down during partition and for the remaining inter-censal period it could not come up to the old efficiency. However, for the major part of the inter-censal period the State had the benefit of a properly functioning registration system. The subject of under-registration of births is further discussed in paras 12 & 13 in Part II of the note.

TABLE 3
Registered Birth and Death Rates and Percentage Omission

States 1		Registered			Computed rate 1941-50	Percentage Omission in 1941-50		Kingsley Davis (1926-30) Percentage Omission in births 8
		1921-30 2	1931-40 3	1941-50 4		Deaths 6	Births 7	
U. P.	B.R.	34.0	34.2	24.8	38.6	39.3	35.8	25.4
	D.R.	25.6	21.9	16.5	27.2			
Bihar	B.R.	34.3	30.6	21.9	39.0	39.5	44.6	22.3
	D.R.	24.4	21.4	16.1	26.6			
Orissa	B. R.	37.3	35.7	28.2	37.2	15.0	24.2	
	D. R.	30.8	28.4	26.0	29.9			
West Bengal	B. R.	28.7	27.5	20.5	35.4			41.6
	D. R.	26.1	20.9	18.9	28.6	33.9	42.1	
Assam	B. R.	27.1	25.6	16.8	46.7			45.6
	D. R.	20.8	17.2	11.4	31.8	64.1	64.0	
Madras	B. R.	31.9	34.7	30.8	35.7			16.1
	D. R.	22.1	22.3	20.6	22.8	9.6*	13.7	
Bombay	B. R.	35.9	37.2	32.9	41.0			22.8
	D. R.	26.7	25.1	22.6	24.9	9.2*	19.8	
Madhya Pradesh	B. R.	41.4	41.2	37.0	45.1			7.1
	D. R.	31.8	31.9	30.3	38.5	21.3	18.0	
Punjab	B. R.	40.6	43.0	39.5	41.2			25.3
	D. R.	30.4	26.3	23.9	26.3	9.1*	4.1	
Combined Part A States.	B. R.	34.2	34.2	21.5	39.9	28.1	31.3	25.3 British (India)
	D. R.	25.6	23.3	19.7	27.4			

*By assumption.

The percentage omission in births is shown to be generally slightly higher than the omission in deaths. The overall percentage of 31.3 for births for Part A States is slightly higher than that brought out by Kingsley Davis. The relative position of the States from the point of view of registration efficiency shown by the two sets of figures in columns (8) and (9) seems to be very much the same. In U. P., Bihar, Assam and Madhya Pradesh the percentage of omissions during 1941-50 are higher than those in 1926-30 suggesting further deterioration in registration efficiency. It may be of interest to mention that in U. P., a sample enquiry to verify births and deaths during Diwali 1947 to Diwali 1948 showed that 29.5% of births and 24.3% of deaths escape registration. In West Bengal the percentage omission of 42.1 is so high that there is little room for further deterioration. However, it may be pointed out that the results based on reverse survival method depend on the life table used. Kingsley Davis himself regarded the life tables used by him for the purpose as imperfect and hence small differences in percentages may not have much significance.

(8.0) Subject to the remarks in the concluding sentence of the last paragraph the estimates of Indian birth and death rates by Kingsley Davis, based primarily on the reverse survival method, may be considered along with the rates now obtained for 1941-50 to see the trends. The relevant figures are shown below :—

Excepting for 1941-50 all the rates shown in columns (2), (3) and (6) are taken from Davis' book. The registered rates relate to Part A States only. The figures in column (6) are the reciprocals of expectations of life at birth obtained from the life table applicable to the period multiplied by 1,000 to get rates per thousand. Life table data relate to a certain level of mortality experience, which is represented by the death rate given here. This is the death rate that will be shown by a community which has attained a stationary condition as regards age and sex composition and is subjected to the life table mortality rates. Naturally, this stationary community will have births equal to deaths in any period of time. Such a balance is never actually obtained, and, therefore, the death rate obtained from the expectation of life merely reflects the general mortality level to which the life table conforms. The absolute figure of death rate does not represent precisely the crude death rate in the actual population. As has been frankly stated by those who prepared Indian life tables the necessary data for deriving rates at childhood ages and particularly for infants are not available ; they have to be guessed on insufficient factual data. In India infant deaths account for 20 to 25 per cent. of total deaths and, therefore, are important in determining the precise figure of crude death rate in the country. The importance of having a correct idea of infant deaths for fixing the death rate in

TABLE 4

Decade	Estimated		Registered		Life Table
	B. R.	D. R.	B. R.	D. R.	D. R.
1	2	3	4	5	6
1881-90	48.9	41.3	...	...	40.0
1891-00	45.8	44.4	34	...	42.0
1901-10	48.1	42.6	37	...	43.7
1911-20	49.2	48.6	37	34	49.8
1921-30	46.4	36.3	34	26	37.3
1931-40	45.2	31.2	34	23	31.5
1941-50	39.9	27.4	28	20	31.2

the entire population may be seen from the fact that according to 1941—50 Indian life table the death rate of 27.4 would change to near about 25 if the population over age 1 only be considered. Thus, from theoretical and practical considerations it appears that a good correspondence between the figure of actual death rate and that based on life table expectation of life may be obtained by chance. The latter rate serves merely as a broad indicator of the level of mortality.

(8.1) From the figures given in column (3) a substantial lowering in the level of death rate during the last three decades is evident. The birth rates in column (2) indicate a lowering in birth rate also, although the level remains more or less the same. It further seems clear that the comparatively accelerated increases in population recorded by the Censuses during the last three decades are due to saving of more lives through a substantial fall in death rate without corresponding decrease in additions to the population through a fall in birth rate. Compared to the decline during the preceding two decades, the lowering of birth rate in 1941—50 is more substantial, while the lowering in the death rate is smaller. In the light of the estimates of birth and death rates for the previous decades it is possible to hold the view that the figures for 1941—50 may be underestimated. A critical examination of the data on which the earlier estimates have been obtained does not rule out the possibility that they are overestimated. They represent the results of a laudable effort to get at the correct position with unsatisfactory data. A conservative appreciation of their value may be that they successfully bring out the levels of birth and death rates, although the precise figures by themselves may be out either way by a small margin. It may be recalled that the estimates of birth and death rates for 1941—50 have been obtained by independent methods and that the two rates fit well with the growth rate brought out by the Census. However, for the sake of argument if it be assumed that the true death rate for 1941—50 is about 30 per mille the birth rate would still be about 42.5 per mille as the mean growth rate for the period is 12.5%. Thus, compared to the previous two decades there is clear evidence for some lowering in birth rate during 1941—50.

(8.2) The registered birth* and death rates bear out the same trends as have been indicated

in the preceding paragraph. However, the registered rates are at much lower levels compared to those of the estimated rates. A comparison of the birth rates given in columns (2) and (4) of table 4 shows that the percentages of omission in birth registration since 1891 through the successive decades were 26, 25, 23, 25 and 30. The percentage was never as high as it was in 1941—50. This seems to indicate a further deterioration in the registration system during the 1941—50 in India as a whole. Certain States show a more marked deterioration than others as has been shown in para. 7. The percentage omission in death registration was 28 in 1911—20 and 28, 26 and 28 in the successive decades. If it be held that the figures of estimated birth and death rates in the previous decades are overstated, the figures of percentage omission in the various decades would point to the system of registration having fared worst during 1941—50.

(8.3) A similar analysis at the State level as has been made in respect of All-India in para. (8.1) could not be made. However, a consideration of the registered birth and death rates in the States during 1921—30 and 1931—40 shown in the Table 3 shows that in the various States true rates in these two decades would be appreciably higher than the corresponding computed rate for 1941—50, if an omission in the registration of births and deaths of more or less the same order as has been observed for 1941—50 can be assumed. The difference is sufficiently high to suggest a small decline in birth rate and appreciable fall in death rate in practically every State.

(9) It may not be inappropriate to conclude this note with a passing reference to the impact of this study on the problem of improving the registration of births and deaths in India. The study shows that in certain large States the present arrangements have yielded reasonably good results in so far as the counts of births and deaths are concerned. Till such time as it becomes possible to allocate the necessary finances for setting up a proper machinery for registration of births and deaths it seems practicable to achieve much better results from the existing machinery than are being obtained in several States, if only the various cogs in the wheel are properly geared up.

ANNEXURE II

PART II

Birth rates derived from infants enumerated

So far the subject of birth rates has been discussed at the State level. However, there is a distinct interest in the consideration of the subject at the level of lower units such as district. A very simple method, which is discussed in this part, is available for tackling this aspect of the subject with the help of Census data. The usefulness of the method is limited in as much as it yields results only in respect of the year preceding the Census. However, the actual study reveals several interesting features relating to infant enumeration in censuses and birth registration in India. Apart from this, the adaptation of the method to the Indian data has a methodological interest of its own.

2. Giorgio Mortara in the pamphlet on "Methods of Using Census Statistics for the Calculation of Life Tables and other Demographic Measures" issued by the United Nations Organisation has given an approximate relationship between the number of infants enumerated at a Census, the births in the preceding 12 months and the infant mortality rate as calculated in the usual manner by dividing infant deaths in a year by the number of live births in the year. This relationship is based on a certain ratio first observed by W. Lexis with reference to Belgium data in his classical work "Abhandlungen Zur Theorie der Bevolkerungs and Moralstatistik" (Jena, Fisher 1903). He found that of the infant deaths from amongst births in say, a calendar year $\frac{2}{3}$ occurred in the calendar year of birth and the balance in the following year. This relationship is not precise, but in the absence of more accurate data may serve as a useful hypothesis for certain investigation. Lexis was of the opinion that this approximate result may be observed in all countries but an extensive investigation into the matter with reference to the data of other countries seems to show that the ratio $\frac{2}{3}$ is more appropriate for populations with infant mortality rates between 100 to 200 per 1,000 live births. When the infant mortality rate becomes very low, this ratio may have a higher value. For instance, for U.S.A. the ratio would be $\frac{5}{6}$ according to 1939-41 experience and perhaps 5 should have an even higher value for 1949-51 when the infant mortality rate was reduced to 30 per 1,000 live births. In

the Western Countries where infant mortality has been very much reduced the reduction has been mainly in the mortality in the later period of infant life. Thus, in such countries deaths in the early infant period account for a large proportion of total infant deaths than they do in countries with higher infant mortality; there deaths in the later period of infant life are still substantially high. This explains why the $\frac{2}{3}$ ratio should be changed to a higher value in countries with low infantile mortality rates.

3. Giorgio Mortara kindly furnished details as to how this $\frac{2}{3}$ ratio was varied from the data relating to other countries. In para. 5 below the results obtained by similar method with the Indian data are given. The derivation of the ratio was straight forward in the case of Belgium data as information on infant deaths was available by months of age at death classified by calendar year of birth. In India, infant deaths in a calendar year are published for each State only by the period of life *viz.*, below 1 week to 1 month, 1 month to 6 months and 6 months to a year, and births are available by the month of occurrence. To determine infant deaths in a calendar year from amongst the birth of the year, it is necessary to fix the breakdown of the deaths recorded under the age groups by month of age. In consultation with Dr. Pandit, the Maternity and Child Welfare Adviser to the Government of India, it is considered reasonable to sub-divide the deaths recorded in the age period of one month to 6 months as 25% in the second month of life, 21% in the third month, 18% each in the fourth, fifth and sixth months. Similarly of the deaths in the age period 6 months to 1 year, 15% are ascribed to each of the seventh, eighth, ninth and tenth months, and 20% to each of the eleventh and the twelfth months. The considered view is that in India mortality in the eleventh and the twelfth months is comparatively higher than that in the immediately preceding months. Similarly, 40% of the deaths recorded between 1st week and 1 month are taken to have occurred in the second week, 30% in the 3rd week, and the rest 30% in the 4th week. These proportions determine the mortality experience in the relevant period of infant life. For instance, the mor-

tality rate in the period 1-2 weeks of life is $0.4q_2$ of the infant mortality rate where q_2 is the ratio of infants deaths recorded for the period of life 1 week to 1 month to the total infant deaths in the calendar year.

4. The number of monthly births multiplied by the infant mortality rate gives the number of infant deaths to be expected among them. To find out how many of these occur within the calendar year of birth, this expected number should be multiplied by certain factors which are determined as follows. Let in a specified period say a calendar year the proportion of infant deaths that occurred within 1 week of life be q_1 , that between 1 week to 1 month be q_2 , 1 month to 6 months be q_3 and 6 months to 1 year be q_4 . For India as a whole, covering all the major States, the actually observed values during 1947-49 were $q_1 = 0.231$, $q_2 = 0.222$, $q_3 = 0.306$ and $q_4 = 0.241$. For individual States the observed values varied considerably round these figures. Now in the calendar year of birth those born in January are exposed to the risk of infant death peculiar to all the first 12 months of age except on the average for half the mortality relevant to the twelfth month of age. The exception comes to $0.1q_4$ of the total infant mortality. Thus, of the infant deaths among the January births, a proportion $(1 - 0.1q_4)$ occurs in the same calendar year. Similarly in the calendar year of birth February born are exposed to the risk of infant death peculiar to all the 12 months of age except for the mortality of the twelfth month and half the mortality of the eleventh month. This exception means $0.3q_4$ of the total infant mortality and hence a proportion $(1 - 0.3q_4)$ of the total infant deaths among February born will occur in the calendar year of birth. Arguing in this way, we get the following factors of proportion for calculating deaths in the calendar year of birth:—

Month	Factor
January	$(1 - 0.1q_4)$
February	$(1 - 0.3q_4)$
March	$(1 - 0.48q_4)$
April	$(1 - 0.62q_4)$
May	$(1 - 0.77q_4)$
June	$(1 - 0.92q_4)$
July	$(1 - q_4 - 0.09q_3)$
August	$(1 - q_4 - 0.27q_3)$
September	$(1 - q_4 - 0.45q_3)$
October	$(1 - q_4 - 0.65q_3)$
November	$(1 - q_4 - 0.88q_3)$
December	$(q_1 + 0.45q_2)$

The expression for December needs a little further explanation. The month consists of 4 1/2 weeks. It will not be incorrect to assume a uniform distribution of births over the month, so that we can take 2/9 of the birth in the month to have occurred every week. During the calendar year, the births in the first week which on the average may be taken to have occurred on the midweek day are exposed to the mortality of the 1st month of life. Thus, of the total infant deaths in these 2/9 births in December a proportion $(q_1 + q_2)$ occur during the calendar year. The next 2/9 births that occur in the second week experience the mortality of the first three weeks and hence the factor of proportion for the births of second week is $q_1 + .7q_2$. Similarly, for the births of the third week, it is $q_1 + .4q_2$ and for those of the 4th week it is q_1 . Regarding 1/9th births during the last half week, it is considered that they will experience 3/4 of the mortality of the 1st week and hence the proportion is 3/4 q_1 . Adding these proportions, we get the factor of proportion to be applied to the births in December to be:

$$\frac{2}{9}(q_1 + q_2) + \frac{2}{9}(q_1 + .7q_2) + \frac{2}{9}(q_1 + .4q_2) + \frac{2}{9}q_1 + \frac{1}{9} \times \frac{3}{4}q_1 = \frac{35}{36}q_1 + 4.2/9q_2 = q_1 + .45q_2$$

(approx)

5. The values of q_1, q_2, q_3, q_4 were taken from the recorded statistics of infant deaths during 1947-1949 for each of the major States for each state for the period 1947-49 the number of infant deaths during the calendar year of birth from amongst the births in the year was calculated by applying the factors giving in para 3 above. The ratio of this number of deaths to the total infant deaths recorded during the period 1947-49 was then obtained. The results are given in col. (3) of the following table:—

TABLE I

State	Infant Mortality rate per thousand	Percentage ratio	
		as calculated	as adopted
	1	3	4
1. Madhya Pradesh	213	73.4	3/4
2. Orissa	184	76.1	3/4
3. Bombay	147	67.7	2/3
4. West Bengal	141	76.3	3/4
5. Punjab	139	69.1	7/10
6. Madras	132	70.6	7/10
7. Uttar Pradesh	107	66.6	2/3
8. Bihar	81	75.2	3/4
9. Assam	97	68.0	2/3
10. All States Combined.	133	70.5	7/10

TABLE I

Column 4 shows the ratio that was adopted in the calculations described below. These results generally conform to the universal observation except to the extent that higher values of the ratio do not go with the lower values of infant mortality rate unlike what has been stated in para 1. It may be observed that the value of the ratio depends on the distribution of infant deaths by months of age. In the Western countries the reduction in infant mortality is the result of active public health and medical activities, which have largely resulted in reducing infant deaths in the later periods of infancy. This results in the infant deaths being concentrated more in the earlier portion of life. In India, the impact of hygienic and medical activities is not so effective in controlling infant mortality. The distribution of infant deaths by months of age is determined more by the peculiar conditions in a State. This may possibly explain the irregular variation of the ratio with reference to the level of infant mortality.

6. Suppose in a State there were b births in the 12 months preceding a Census. There will be $b \times r \times I$ deaths among them by the Census time. Here, r is the ratio $2/3$ or $7/10$ or $3/4$ as obtained in Table I and I is the infant mortality rate as recorded in the preceding year. Thus, E the number of infants enumerated at the Census is related to be as follows:—

$$E = b(1 - rI) \dots \dots \dots (1)$$

There are three variables E , b , I in equation (1). If two are known, the third can be calculated. Relying on the accuracy of E as given by the Census and of I as registered, we can get a good estimate of b . As the total population is known correctly from the Census, the birth rate thus obtained for the year preceding Census should be fairly reliable. It was primarily with an idea to obtain some estimates of birth rates in the year preceding the Censuses that data by districts giving the number of births registered in the 12 months preceding the Census date, recorded infant mortality rate during the preceding year and the infants enumerated were collected from the States for the last four Censuses. It is well known that in India none of E , r and I is known absolutely correctly. As is obvious, the reliability of the calculated rates depends on the accuracy with which E , r , and I are available. As regards the last, it does not appear that it need be known with perfect accuracy, as the final effect on the accuracy of b due to an approximation in I is not very substantial. The value of I for the various parts of

India may broadly be taken to be lying between 100 and 200 per 1,000 live births. The estimated births by taking $I=0.1$ come out to be only nearly 7% lower than the estimate based on $I=0.2$, taking $r=2/3$ in each case. Infant mortality rate is a ratio of infant deaths to births, both of which are subject to omissions in registration though by varying degrees. As is shown in the next paragraph, the true rate can at the most be double of the recorded rate.

7. Let the birth registration efficiency as suggested by the proportion of registered births to the actual births be p and a similar infant death registration efficiency represented by the proportion of registered infant deaths to the actual infant deaths be q . Obviously, each of p and q is less than 1. Further, let B and D be registered births and infant deaths in a year and b and d be their true values.

Then, $B=pd$ and $D=qd$.

$$\text{Observed infant mortality rate} \quad I = \frac{D}{B} = \frac{q}{p} \times \frac{dc}{b} = \frac{qi}{p} \dots (i)$$

Where i is the true infant mortality rate.

It is well known that circumstances which lead to the omission of births from being registered are stronger for the omission of infant deaths from being registered. Thus, p is greater than q . From relation (i), it then becomes obvious that the true infant mortality rate i is higher than the observed value I . Let the true rate of infant mortality be K times the observed rate. The ratio K is given by the relative proportions of births and infant death registrations.

The following table shows for the various values of K , the permissible percentage omission in infant death registration against the different levels of birth registration efficiency:—

p	Upper limit of percentage omission in infant deaths when					
	K=5/4	K=3/2	K=2	K=3	K=4	
0.8	20	36	47	60	73	80
0.6	40	52	60	70	80	85
0.5	50	60	67	75	83	87
0.4	60	68	73	80	87	90
0.2	80	84	87	90	93	95

Objectively, there seems to be no evidence for fixing K but from the above limits, it seems

reasonable to take that the true infant mortality rate is at most twice the registered rate, it may well be less.

8. There is little doubt that the true value of r is near about $2/3$. The calculations made above show that it may be $7/10$ or $3/4$ in some cases. The effect on the estimate of b for the variation in the value of r from $2/3$ to $3/4$ is very small. However, it is quite possible that the uncertainty in the value of r combined with that in the value of I may substantially affect the estimate of b . The following table shows the magnitude of this effect when r is taken as $2/3$, $7/10$ and $3/4$ in combination with the values of I taken at the true levels of 80, 160, 250 per 1,000 live births, which cover the range likely to be met in India. The figures given below show the percentage by which the estimated births come out to be higher than the number obtained by taking $r = 2/3$ and $I = 80$.

Infant mortality rate	$r=2/3$	$r=7/10$	$r=3/4$
80	...	0.3	0.7
160	6.0	6.6	7.6
250	11.4	14.5	16.6

9. From the discussions in the preceding paragraphs it is seen that a considerable amount of uncertainty in the value of I & r can be tolerated and yet a fairly good estimate of births may be obtained. However, the reliability of E directly affects the reliability of the estimated births to the same extent. As will be seen in the following paragraphs the number of infants enumerated at the past Censuses appears to be inconsistent with some other available evidence. This affects the reliability of the estimated births deduced from the above relationship. The number of infants enumerated in 1951 Census is generally more consistent and in this respect this Census appears to be an improvement over those in the past.

10. Table 2 shows the estimated births during the 12 months preceding the Census date obtained by the method in respect of the major States except Bombay, for which the data were not furnished. The figure of estimated births given in the table is calculated directly from the number of infants enumerated in the State as a whole. Alternatively it could be taken as the total of estimated births by districts in the State. Actual calculations show that the two agree very closely.

TABLE 2

Normally, infants enumerated should be less than the registered births and so the ratio shown in column 6 would be less than 100. Instances, where the ratio is substantially above 100, give a clear proof of a considerable under-registration of births. It does not appear probable that the infants in a State could be enumerated materially in excess of the real survivors of births during the preceding 12 months, for the important factor which can inflate the enumeration figure is only net gain due to immigration of infants. In all probability there is an under and not over enumeration. From general considerations it does not appear probable that there is any substantial migration of infants at the States level. Thus there appears to be little reason to believe that enumerated figure is in any way inflated, if anything, it may well be understated due to omission of infants from being recorded in the Census. The latter is a more true of the Indian Censuses. It therefore, appears that the extent of omission in registration brought out in cases where the ratio is above 100 may well be taken as an estimate on the lower side of under-registration of births in the relevant year. This would be so for another reason. The other factors besides E which are likely to affect the estimated births from equation (1) are the values of r & I . As would be clear from the explanations given in the preceding paragraphs the probable variation in r does not affect the results materially. If anything, the registered value of I , which is adopted in the calculations, is an under-estimate. The combined effect is that the expression $(1-rI)$ is overstated with the consequent result that the number of births from equation (1) is under estimated. Now the individual instances where infants enumerated exceed the register births may be considered.

Assam data consistently show in col. 6 a ratio exceeding 100. In 1951 this ratio shows an abrupt increase over the level in the preceding censal years. Column (5) of the table gives the ratio of registered births to estimated births. The difference of the ratio from 100 gives an idea of the extent of under-registration of births, taking the estimated figure as the correct one. Thus, in Assam the under-registration of births was by 21%, 34% and 27% in the years 1920, 1930 and 1940 respectively but in 1950 it was by 62%. There is little doubt about the sudden deterioration in the registration of births in recent years and these figures would seem to give a good indication of its extent. The estimated birth rate works out to 37 per mille

as against 14 per mille registered in 1950. The estimated birth rate comes to 34, 39 and 33 per mille in 1920, 1930 and 1940 respectively. These estimated birth rates are fairly consistent and may, therefore, be taken to indicate the true level of the birth rate.

Considering other instances where the ratio in col. 6 exceeds 100, it is seen that a similar position is revealed by the data for 1950 relating to Bihar. The under-registration of births appears to be of the order of 65%. The estimated birth rate in 1950 comes to 50 per mille as against 18 per mille registered. The figure obtained for this one year does not seem to reflect the level of true birth rate in Bihar. Delhi shows a deficiency of 42% in the registration of births in 1950. The estimated birth rate in 1950 is 55 per mille as against 32 per mille registered.

Madhya Pradesh shows a deficiency of 16% in the registration of births in 1950. The estimated birth rate in 1950 comes to be 39 per mille as against 33 per mille registered. In the Punjab though the ratio in column (6) is less than 100, column 5 shows a deficit of 4%, giving an estimated birth rate of 40 per mille in 1950 as against 38 per mille registered. This is commented upon in the next paragraph. In U.P. the deficiency in the registration of births in 1950 was by 42%. The estimated birth rate in 1950 works out to 36 per mille as against 21 per mille registered. West Bengal shows a deficiency of 32% in the registration of births in 1950 and thus the estimated birth rate comes to 27 per mille as against 18 per mille registered. The estimated birth rate comes out to be much lower than in the other cases cited above. The ratio for 1931 also is above 100 and the deficiency in the registration of birth rate comes to 23%. From the above it appears that in respect of 1950 there is evidence of high degree of under-registration in Assam, Bihar, U.P., Delhi and West Bengal. It is also shown that the true birth rate in 1950 in most of the States was near about 35 to 40 per mille with the possible exception of West Bengal. It is, therefore, clear that the low registered birth rate noticed in the recent years is mainly due to a serious under-registration of births.

There are a few instances where the ratio in column (6) is below 100 but column (5) shows a deficient registration. Madras in 1921 shows a deficiency of 6.5% in registration. In U.P. there is an evidence of a small under registration of births by 0.4% in 1931. The

Punjab data in 1931 and 1921 show a deficiency of 4% and 10% respectively. West Bengal data for 1921 shows under-registration by 10%. In Orissa an under-registration of 5.6% in 1941 is shown. In all other instances the infants enumerated are so much short of the registered births that the estimated births based on the enumeration figure come out to be lower than the registered births. This fact is reflected in the ratio in column 5 coming out to be above 100. This fact clearly points to the under-enumeration of infants at the Censuses. Leaving out Assam, practically all the past Censuses in the various States give evidence of under-enumeration of infants. Only 1951 Census data except those for Madras do not give evidence of under-enumeration according to the method adopted here.

With the help of relationship (1) given in para 6, it is easy to see that the ratio in column 5 is really the ratio of registered births to infants enumerated multiplied by the factor $(1-r)$. The factor is very nearly 1. If the registration of births be fairly good but infant enumeration be comparatively much worse the ratio in column 5 would come out to be above 100. This probably explains the higher value of the ratio in 1951 Census in the case of Madras. In para (13) some evidence is produced to show the poor infant enumeration in Madras in 1951. In 1951 Census ratio is very much below hundred in the case of Assam, Bihar, Delhi, U.P. and West Bengal, probably because infant enumeration efficiency is comparatively better than the birth registration efficiency. For the same reason, it is possible that the small deficiency in birth registration brought out for some States may in part be due to the under-enumeration of infants and not due entirely to better registration. The estimated birth rates as obtained here generally do not appear to be unreasonable when compared with the estimates for 1941-50 obtained in Part I. This is discussed in para (6.1) there.

11. From the above discussion it appears that the Census enumeration of infants in 1951 is sufficiently reliable for the applicability of equation(1) from which a fairly reasonable estimate of birth rate in 1950 can be obtained.

Although the results based on a study of the data for one year may lack the authenticity of those based on the data for a number of years, the ratio of registered births to the estimated births may be used to assess the completeness of registration in the various districts in a State

However, it may be borne in mind that the number of infants enumerated in a district is likely to be affected a little more by migration than in the case when State is taken as a whole. The following table shows the percentage omission in birth registration, and the registered and the estimated birth rates in 1950. The birth rates have been calculated on the censal population projected back by 6 months to accord with the midpoint of the year for which births are taken.

TABLE 3

In the above table percentage omission and estimated birth rate have not been given where the registered births exceed the estimated births. The value of I based on registration data is, if at all, an underestimate. As has already been seen in para 8, this would lead to slight under-estimation of births, but it seems unlikely that registered births will exceed the estimated births merely on this account. If the excess is substantial, it is more likely to be due to the under-enumeration of infants. In cases where a positive percentage omission is obtained, it is not unlikely that there may be some under-enumeration of infants as well, and this would lead to a still higher percentage omission. These remarks shall be kept in mind in the following discussion.

12. The above table brings out the poor State of registration in every district in Assam. Even in Cachar, where percentage omission is the least, one third of the births escape registration. Kamrup and Nowgong seem to have the worst registration arrangements. Darrang and Sibsagar have a very high true birth rate. The birth rate in other districts are generally above 30 per mille. Similar seems to be the cases in Bihar, where registration is shown to be as bad as in Assam. It seems to be particularly poor in the districts of Saran, Saharsa, Purnea, Monghyr, Bhagalpur, Hazaribagh and Santhal Parganas. Purulia and Palamau seem to have about the best arrangements, but even here nearly one third of the births escape registration. Another remarkable thing is the high birth rate in most of the districts, of which Saran, Darbhanga, Purnea and Bhagalpur may be especially noted. Only Purulia, Dhanbad, and Singhbhum have birth rates below 30 per mille.

In Madhya Pradesh the percentage omission of births seems to be low in most of the districts. Only in Sagar, Mandla, Betul, Balaghat and Wardha the omission is substantial and over one third of the births are not registered. The omission seems to be particularly low in Nimar, Chanda and Amraoti. In Akola and Yeotmal, it is likely that a substantial number of infants may have escaped enumeration, which will probably explain why registered births exceed estimated births. In every district the level of birth rate is round about 40 per mille. In Punjab there is a substantial omission in the registration of births in the districts of Karnal but in Hissar, Rohtak, Gurgaon, and Ambala it is considerably low. In Hoshiarpur it is fairly low. In other districts the enumeration of infants appears to have been defective, which seems to be the reason why registered births exceed estimated births. This explains the low overall omission in birth registration for the State as a whole, although in the individual districts where it is possible to have some deal of under-registration it is not so low. In Punjab where the estimated birth rate can be calculated, it is well above 40 per mille. In the remaining districts the registered birth rate is generally between 35 and 40 per mille.

13. In the U.P. there is a wide range of omission in registration. The districts of Allahabad, Jaunpur, Partapgarh, Bahraich, Unao and Kheri are the worst but Etah, Faizabad, Gonda and Barabanki show omission from registration of over 50% of births. Almora and Garhwal are the only ones which show low percentage omission, but this may be due more to defective enumeration of infants in these hilly districts rather than due to better registration. Otherwise, practically no district shows omission by less than 20%. Barring Ballia, Gorakhpur, Deoria and Azamgarh practically all the districts have estimated birth rates well above 30 per mille. A good proportion shows birth rates above 40 per mille. Here, it will be of interest to mention that in U.P. a sample enquiry into the extent of under registration in 44 out of 49 districts was conducted. The District Medical Officers of Health were asked to verify births and deaths for the period Diwali 1947 (12th November 1947) to Diwali 1948 (1st November 1948) in about 200 villages in each district and of these at last forty villages were required to be covered by a house-to-house enquiry. The details of the enquiry are published in Vol. LXXXVII No. 4 of the Indian Medical Gazette, page 167-171

(April 1952). The percentage omission of births obtained in the enquiry are shown in the extra column in the case of U.P. in Table 3. The enquiry covered rural areas only, but as over 85% of the population in the State lives in villages, the results of the enquiry may well be taken to reflect the conditions of registration in the individual districts, provided the statistical considerations were kept in view in the selection of the village and the conduct of the enquiry. It does not appear that the sample size is adequate for drawing inferences at the district level. However, it does not seem to be necessary to go into these considerations, when the object is to trace broad similarities in the results of this enquiry and the percentage omissions arrived at from the census data. The first point of interest is that omissions to the extent of 60% and 70% determined from the Census data were also obtained in the enquiry. The enquiry brings out a deficiency of 30% for the whole of the State, whereas the figure given by the calculations from the Census data is 42%. The Districts which show an exceptionally high percentage omission are Allahabad, Unao and Kheri in the sample enquiry also. In the enquiry of 40 districts surveyed 19 districts showed omissions of 30% or more and 18 of these have a high percentage omission according to the census data also. In 6 districts the percentage omissions are below 30% by both the methods. In the remaining 16 the percentage omission by one method is above 30% but below 30% by the other method. Considered on the whole, it may be said that the picture of under-registration brought out by the calculations from the Census data does not seem to be materially different from that shown by the survey.

In West Bengal the omission is particularly high in the districts of Burdwan, Bankura, Howrah, 24 parganas. It is low in Birbhum, Jalpaiguri and Darjeeling. The estimated birth rates in every district work out to be well above 20 per mille and are generally between 25 to 30 per mille. The data for Orissa are available only for three districts. There Cuttack and Puri show registered birth in excess of the estimated births probably due to under-enumeration of infants. Only Balasore shows a small deficiency. The birth rate in the districts in Orissa in 1950 seems to be near 30 per mille.

Madras is the only State which generally shows the estimated births to be lower than the registered births. The following table shows the number of infants enumerated in 1951 census and

the number of births registered in the preceding twelve months in some of the districts :—

<i>District</i>	<i>Infants</i>	<i>Registered Births</i>
East Godavari . . .	16,030	57,801
West Godavari . . .	14,420	44,033
Madras	34,300	52,587
North Arcot	72,880	92,303
Coimbatore	77,370	94,617
Tanjore	60,580	80,224
Tirunelveli	58,100	77,211
Malabar	121,180	150,167
South Kanara	50,540	60,604

It is true that infants enumerated should be less than the registered births but not by so much as these figures show. The disparity in the figures for East and West Godavari is so glaring that no comments are needed. Taking the case of the Coimbatore which shows the nearest figures, calculations indicate that the infant mortality rate should be 260 per thousand in order that the number of infants enumerated may be the survivors of the registered births. If under-registration is also to be allowed for, infant mortality rate should be considerably higher. According to the registration records the infant mortality rate in the district was 114 only. It does not seem likely that the registered infant mortality rate is so grossly deficient. Considered similarly it seems there was under-enumeration of infants in most of the districts. Even in districts where the percentage omission is positive, it is low except in Chittoor and Nilgiris. In the circumstances, the method is not appropriate and it is difficult to draw any reliable inference about the true level of birth rates in the State.

14. From the above remarks it appears that in states like Assam and Bihar registration is particularly bad, while in U.P. and West Bengal it is comparatively better though still bad enough. In the major portion of Madhya Pradesh and Punjab, it is not very unsatisfactory. By the method adopted, it is not possible to draw any reliable inference about the state of registration in Madras. The data relating to Orissa are insufficient and those relating to Bombay are not available. As regards birth rate, it seems to be clearly established that where the registered rate is low, the percentage omission is high. This shows that the lower birth rate which is being shown in the recent years by the registration data is due more to under-registration than to any substantial reduction of births in the country.

TABLE 2.

State	Census year	Infants Enumerated	Registered Births	Estimated Births	Ratio (3)/(4)	Ratio (2)/(3)
I	2	3	4	5	6	7
1. Assam	1951	669840	110138	290370	37.9	245.0
	1941	193590	156155	213200	73.2	123.9
	1931	186844	140649	212082	66.3	132.9
	1921	134858	122404	154796	79.1	110.2
2. Bihar	1951	1895918	705243	3008387	35.1	268.8
	1941	706800	1006005	770438	130.6	70.3
3. Delhi	1951	87440	54412	93880	58.0	169.7
	1941	20700	33859	23329	145.1	61.1
	1931	20684	24654	23165	106.1	61.5
	1921	17233	119733	...	...	87.9
4. Madras	1951	4280190	1538540	1408349	109.2	83.2
	1941	1140700	1584198	1292724	122.5	72.0
	1931	1139207	1463902	1308681	111.9	77.8
	1921	969269	1023656	1094972	93.5	94.7
5. Madhya Pradesh	1951	621586	604649	720429	83.9	102.8
	1941	408529	627946	485304	129.4	65.1
	1931	542593	664217	653254	101.7	81.7
	1921	388252	544081	470210	115.9	71.2
6. Punjab	1951	442870	479429	498727	96.1	92.4
	1941	362200	522404	420478	124.2	69.3
	1931	394957	437486	455177	96.1	90.3
	1921	381492	402369	444319	90.6	94.8
7. Uttar Pradesh	1951	2056050	1295505	2219158	58.4	358.7
	1941	1371700	1680595	1514853	110.9	81.6
	1931	1497178	1693173	1700758	99.6	88.4
	1921	1388700	1662192	1642848	101.2	83.5
8. West Bengal	1951	591474	440880	650686	67.8	134.2
	1941	565250	657603	632059	104.0	86.0
	1931	581962	517339	675600	76.6	112.3
	1921	510061	543372	603408	90.2	93.7
9. Orissa	1951	105300	132448	117104	113.1	79.5
	1941	153800	165961	175832	94.4	92.7

District and State	% Omission		Registered Birth Rate	Estimated Birth Rate
	From census data	From enquiry		
38. Lucknow	35.3	35.0	24.1	37.3
39. Unao	72.5	59.8	9.5	34.5
40. Rae Bareilly	49.3	45.0	16.8	33.1
41. Sitapur	48.3	27.6	19.0	36.7
42. Hardoi	43.4	31.0	21.7	39.8
43. Kheri	60.0	71.2	14.2	35.5
44. Faizabad	53.4	34.5	14.7	31.6
45. Gonda	54.1	55.0	14.0	30.6
46. Bahraich	59.0	28.0	13.9	33.9
47. Sultanpur	45.0	43.8	15.9	28.9
48. Partapur	67.8	44.4	11.1	34.6
49. Bara-Banki	50.9	22.9	16.3	33.2

District and State	% Omission	Registered Birth Rate	Estimated Birth Rate
VII. West Bengal	32.2	18.3	27.0
1. Burdwan	46.0	16.2	30.2
2. Birbhum	9.4	19.7	21.8
3. Bankura	48.2	19.2	37.1
4. Midnapur	11.1	22.7	25.6
5. Hooghly	33.5	17.4	26.3
6. Howrah	47.3	13.1	24.9
7. 24 Parganas	46.4	13.1	24.7
8. Calcutta	16.0	19.2	22.9
9. Nadia	25.9	15.4	24.0
10. Murshidabad	32.9	22.8	34.0
11. Malda	36.5	19.4	30.6
12. West Dinajpur	23.1	18.0	23.5

District and State	% Omission	Registered Birth Rate	Estimated Birth Rate
13. Jalpaiguri	2.3	27.3	28.1
14. Darjeeling	3.9	25.3	26.3
VIII. Orissa	...	29.3	...
1. Cuttak	...	28.0	...
2. Balasore	12.5	25.1	28.7
3. Puri	...	35.6	...
IX. Madras	...	29.1	...
1. East Godavari	...	23.9	...
2. West Godavari	...	25.9	...
3. Krishna	2.7	28.0	28.8
4. Guntur	...	28.7	...
5. Nellore	6.5	26.4	28.3
6. Cuddapah	2.9	28.2	29.0
7. Kurnool	5.6	33.9	35.9
8. Ballary	7.5	34.5	37.3
9. Anantapur	...	35.7	...
10. Madras	...	37.1	...
11. Chingleput	...	28.1	...
12. Chittoor	22.7	27.3	35.4
13. North Arcot	...	32.3	...
14. Salem	12.3	24.0	27.3
15. Coimbatore	...	28.7	...
16. South Arcot	...	29.4	...
17. Tanjore	...	26.9	...
18. Tiruchirapalli	...	26.5	...
19. Mathurai	...	26.8	...
20. Ramanathapuram	...	30.3	...
21. Tirunelveli	...	31.6	...
22. Nilgiris	42.5	27.5	47.8
23. Malabar	...	31.6	...
24. South Kannara	...	34.7	...

ANNEXURE III

Logistic Graduation of Maternity Data : and derivation of Table of Age Specific Maternity Rates.

(By Shri P. N. Kaul, Central Tabulation Officer)

THE 10 percent sample data on maternity collected during the 1951 Census and published in this paper relate to all women (other than unmarried women) in Travancore-Cochin and the three divisions of Madhya Pradesh. This note relates only to those mothers who were still married on Census day and explains the results of an attempt to fit a curve to the observed values of Child birth indices or "average number of children born" to each mother of different maternal groups.

2. All the mothers are divided into four groups according to the age at which they had their first child birth. The four groups are as

follows :—

	<i>Age at birth of First Child</i>
Maternity Type A	. 15 to 19
Maternity Type B	. 20 to 24
Maternity Type C	. Over 24
Maternity Type D	. Under 15

This is the observed order in every natural division. The maternity type D is found to be numerically insignificant. Both maternity types C and D taken together account for a little more than one tenth of the total number. Accordingly curve fitting was attempted only for the maternity types A and B. The table below furnishes the figures of child birth indices computed from the maternity data of these two States.

TABLE I

<i>Child birth indices (Number of children born per mother)</i>									
<i>Division→</i>	<i>Travancore-Cochin</i>		<i>East Madhya Pradesh</i>		<i>North-West Madhya Pradesh</i>		<i>South-West Madhya Pradesh</i>		
<i>Age of the mother at birth of first child→</i>	15—19	20—24	15—19	20—24	15—19	20—24	15—19	20—24	
<i>Present age of the mother</i>									
	1	2	3	4	5	6	7	8	9
All ages		4.6	4.0	4.5	4.0	4.5	3.9	4.4	4.1
Completed Maternity (Mothers aged 45 and over)		7.3	6.4	6.8	5.9	6.9	6.0	7.1	6.2
<i>Incomplete Maternity:</i>									
(1) 15—19		1.2	...	1.3	...	1.3	...	1.3	...
(2) 20—24		2.0	1.3	2.2	1.4	2.4	1.5	2.2	1.3
(3) 25—29		3.6	2.3	3.7	2.4	3.7	2.2	3.7	2.2
(4) 30—34		4.8	3.7	5.1	3.7	4.9	3.7	5.0	3.5
(5) 35—39		6.0	4.9	6.0	4.8	5.9	4.7	6.0	4.7
(6) 40—44		6.8	5.8	6.4	5.5	6.5	5.4	6.6	5.5

3. The child birth indices were plotted against the age of the mother for the maternity types A and B, one for each division. The plotted points were observed to fall along a logistic shaped curve. Therefore a curve of the type,

$$Y_t = L / (1 + e^{-\frac{\beta-t}{a}})$$

(where Y is the child birth index at time t and L, β and a are constants) was fitted by the method of 3 selected points. The median ages of the Incomplete Maternity groups (1), (3) and (5), were selected as the points through which the curve should pass. The values of L, β and a which were obtained for 8 child birth curves are shown in table below.....

TABLE II.

Division→	Travancore-Cochin		East Madhya Pradesh		North-West Madhya Pradesh		South-West Madhya Pradesh		
	15-19	20-24	15-19	20-24	15-19	20-24	15-19	20-24	
Age of the mother at birth of first child→									
Parameters:									
	1	2	3	4	5	6	7	8	
L		7.64	6.78	6.68	6.22	7.18	6.02	7.21	6.55
B		29.09	31.49	26.22	30.04	27.23	29.53	27.37	31.37
a		6.42	6.35	5.22	6.22	6.57	6.13	6.09	6.57

4. Table III below shows the comparison of the observed values of child birth indices (in table I) and corresponding graduated values read off from the curves (in table II) for the

median ages of quinquennial age groups below 45. For age groups 45 and over the asymptotic value (L) is furnished for comparison in the column for graduated values.

TABLE III

Division→	Child birth indices								
	Travancore-Cochin		East Madhya Pradesh		North-West Madhya Pradesh		South-West Madhya Pradesh		
	Observed value	Graduated value	Observed value	Graduated value	Observed value	Graduated value	Observed value	Graduated value	
Age of the mother at birth of first child									
Age group									
	1	2	3	4	5	6	7	8	
15-19	15-19	1.2	1.0	1.3	1.1	1.3	1.3	1.3	1.2
	20-24	2.0	2.0	2.2	2.2	2.4	2.4	2.2	2.2
	25-29	3.6	3.3	3.7	3.7	3.7	3.7	3.7	3.6
	30-34	4.8	4.8	5.1	5.1	4.9	4.9	5.0	5.0
	35-39	6.0	6.0	6.0	6.0	5.9	5.9	6.0	6.0
	40-44	6.8	6.8	6.4	6.4	6.5	6.5	6.6	6.6
45 & over	7.3	7.6	6.8	6.7	6.9	7.2	7.1	7.2	
20-24	20-24	1.3	1.3	1.4	1.4	1.5	1.5	1.3	1.3
	25-29	2.3	2.3	2.4	2.5	2.2	2.5	2.2	2.3
	30-34	3.7	3.7	3.7	3.7	3.7	3.7	3.5	3.5
	35-39	4.9	4.9	4.8	4.8	4.7	4.7	4.7	4.7
	40-44	5.8	5.8	5.5	5.5	5.4	5.4	5.5	5.5
	45 & over	6.4	6.7	5.9	6.2	6.0	6.0	6.2	6.5

5. Since the observed values and the values read off from the curve are sufficiently close, it is assumed that the logistic curve may be accepted as a reliable basis for estimating the child birth index corresponding to any individual year of age. Accordingly, values of Y_t (which are deemed to be child birth indices of mothers of age t) have been computed from the logistic curve for each age from age 15 to age 44. At this stage, the following assumption was made viz. :—*If at the beginning of the year, the average number of children born to mothers of age t is Y_t , and to mothers of age $t+1$ is Y_{t+1} , the average number of children born to the former by the end of the year would be Y_{t+1} . Hence the number of children born during a period of one year to 1000 mothers of age t would be $1000(Y_{t+1}-Y_t)$.* The number may be referred to as the “Age Specific Maternity Rates.” Accordingly a series of values for $1000(Y_{t+1}-Y_t)$ have been computed and set out in ‘Table of Age Specific Maternity Rates’ (Table IV). The validity of these rates is necessarily dependent on the validity of the assumption made above. It seems to be a reasonable assumption to make, at any rate as a working hypothesis, to be confirmed or revised on the basis of further study. Even if the as-

sumptions were valid, an error might still be imported into these rates if, for any reason, the basic data contained an element of systematic statement which might be present in the returns of the ‘number of children born’ would be reflected in the child birth indices and might also be reflected in the maternity rates. In view of the possibility of forgetfulness among the older women, the possibility of a systematic error cannot be overlooked.

6. The table ‘Age Specific Maternity Rates’ gives the number of married women of age specified in column (1) who may be expected to have a child-birth during a period of 12 months. Hence the corresponding proportions may be treated as giving the probability that a woman in a specified age gives birth to a child. It is assumed that the number of cases in which twins are born or in which the same mother gives birth to two children—one at the beginning and the other at the end of the 12 months period—is negligible. On this basis, it is possible to deduce the ‘crude birth rates’ and compare them with ‘registered birth rates’, as shown in the Table IV.

TABLE IV
Age Specific Maternity Rates

Number per 1,000 married women of age specified in column (1) who may be expected to have child birth during a period of 12 months.

Maternity Type → Age (In number of complete years)	Travancore-Cochin		East Madhya Pradesh		North-West Madhya Pradesh		South-West Madhya Pradesh	
	A	B	A	B	A	B	A	B
	1	2	3	4	5	6	7	8	9
15	114	...	129	...	135	...	129	...
16	129	...	150	...	149	...	146	...
17	145	...	170	...	165	...	163	...
18	161	...	194	...	181	...	181	...
19	178	...	217	...	197	...	200	...
20	196	136	240	146	213	149	219	135
21	213	152	263	161	227	165	236	148
22	231	168	282	177	241	179	253	163
23	248	184	299	192	252	195	268	178
24	262	200	312	206	262	208	280	192
25	275	215	318	219	268	221	289	206
26	286	229	320	231	272	231	294	218
27	293	242	315	240	273	238	296	228
28	296	253	305	246	271	241	293	235
29	297	260	290	249	265	248	287	246
30	294	265	271	249	257	244	277	250
31	287	267	251	247	246	239	264	249
32	277	265	227	240	233	231	249	248
33	264	260	204	231	220	221	232	243
34	251	253	180	221	204	209	214	236
35	234	242	159	207	185	196	195	226
36	216	228	138	193	175	180	177	215
37	199	216	118	178	157	165	158	202
38	182	200	102	162	141	150	142	188
39	164	183	86	147	127	135	125	174
40	147	168	74	132	113	120	110	160
41	132	151	62	119	101	107	97	144
42	116	137	52	104	88	95	84	131
43	103	121	43	98	79	82	73	118
44	91	108	37	76	68	57	63	105

TABLE V

Division	Upper Limit Estimate Birth Rate		Registered birth rate (1941-50)	Number of unregistered births per 100 registered births (Upper Limit Estimate)
	1951	1941-50		
1	2	3	4	5
Travancore-Cochin	36.6	36.8	20.3	81
Madhya Pradesh {	East	44.8	46.4	32
	North-West	40.5	41.7	13
	South-West	42.8	43.5	10

The figures of column 2 and column 3 of the foregoing table were obtained as below :

First,— the *upper limit* of the probability that any married female of a given age will have a child birth during a period of twelve months was taken to be the *higher of the two values* furnished for maternity types A and B in the table annexed.

Secondly,— *maternity rates were then deduced for all five-year-age groups of incomplete maternity on the assumption that the rate for the five year age groups is the same as that of the mother of median age in that group.* The median ages are 17.471, 22.381, 27.368, 32.393, 37.411 and 42.632 for Travancore-Cochin and 17.404, 22.503, 27.471, 32.415, 37.390 and 42.388 for each of the three divisions of Madhya Pradesh. The median ages have been worked out from the smoothed age table for females. The rates for the three ten year age groups 15 to 24, 25 to 34 and 35 to 44 were then determined by combining pairs of rates for corresponding quinquennial groups, the rates being weighted by the number of mothers in each quinquennial age group (15 to 19, 20 to 24 etc.).

Thirdly,— the number of married females in each of the three ten year age groups mentioned

above for each of the four territorial units are known both for 1951 and for 1941 from Census tables. Applying the rates to these numbers the *upper limit* to the total number of live births to be expected in a twelve months' period can be computed and the corresponding upper limits of the Birth Rates determined therefrom.

There are other methods (entirely independent of maternity data) by which the Birth Rate as, well as the extent of omissions present in registration of births, may be estimated.

7. After the foregoing analysis was completed similar data were received from West Bengal. This data was collected for villages of West Bengal, in the course of a "Training Sample Census" which had been undertaken shortly before the 1951 Census, in order to provide training to Enumerators and Supervisors. Though the size of sample is much smaller the data appeared to be promising. Logistic graduation was attempted and other computations made in the same manner as explained above. The results are set out in three tables (Tables VI to VIII) which show the Child Birth Indices and Age Specific Maternity Rates for villages in two groups of districts of West Bengal.

TABLE VI

Districts/Age Groups	Child Birth Indices		
	Observed	Graduated	
I	2	3	
Birbhum, Bankura, Howrah, 24-Parganas, Malda and West Dinajpur.	15-19.	1.4	1.3
	20-24.	2.3	2.3
	25-29.	3.5	3.5
	30-34.	4.7	4.7
	35-39.	5.5	5.6
	40-44.	6.2	6.2
	45 and over	6.3	6.8
Burdwan, Nadia, Murshidabad and Jalpaiguri	16-20.	1.5	1.4
	21-25.	2.5	2.5
	26-30.	3.8	3.9
	31-35.	5.0	5.0
	36-40.	5.9	6.0
	41-45.	6.5	6.5
	46 and over	6.3	7.1

TABLE VII
Age Specific Maternity Rates

Age (in number of complete years)	Districts→		Number per 1000 married women of age specified in Column (1) who may be expected to have child birth during a period of 12 months		
	1	2	Birbhum, Bankura, Howrah, 24—Parganas, Malda and West Dinajpur	3	Burdwan, Nadia, Murshidabad and Jalpaiguri
15	.	.	.	132	131
16	.	.	.	147	145
17	.	.	.	161	160
18	.	.	.	176	174
19	.	.	.	191	189
20	.	.	.	205	203
21	.	.	.	218	216
22	.	.	.	230	229
23	.	.	.	240	239
24	.	.	.	248	248
25	.	.	.	253	254
26	.	.	.	256	258
27	.	.	.	256	259
28	.	.	.	252	258
29	.	.	.	246	254
30	.	.	.	238	247
31	.	.	.	227	238
32	.	.	.	215	227
33	.	.	.	202	214
34	.	.	.	187	201
35	.	.	.	173	186
36	.	.	.	158	172
37	.	.	.	143	157
38	.	.	.	129	143
39	.	.	.	116	129
40	.	.	.	103	116
41	.	.	.	92	104
42	.	.	.	81	92
43	.	.	.	71	82
44	.	.	.	63	72

TABLE VIII

Age Groups	Districts→				Birbhum, Bankura, Howrah, 24—Parganas, Malda and West Dinajpur	Burdwan, Nadia, Murshidabad and Jalpai- guri
	I	2	3	4	2	3
<i>Age group specific Ma- ternity Rates (Number per 1,000 married wo- men who may be ex- pected to have child birth during a period of 12 months.)</i>	15—19	.	.	.	168	166
	20—24	.	.	.	235	233
	25—29	.	.	.	255	259
	30—34	.	.	.	213	222
	35—39	.	.	.	138	152
	40—44	.	.	.	77	89
	15—24	.	.	.	210	204
	25—34	.	.	.	236	244
	35—44	.	.	.	111	128
Crude Birth Rate	1931	.	.	.	34·8	38·1
	1941	.	.	.	36·2	36·7
Mean Decennial Birth Rate	1941—50	.	.	.	35·5	37·4

APPENDIX III
REVIEW OF CENSUS ECONOMIC DATA

APPENDIX III

Review of Census Economic Data

PART—A

Census questions, definitions and classifications

I.—1951 CENSUS QUESTIONS AND INSTRUCTIONS

THE Census is concerned with two economic characteristics of every individual—his (or her) economic status and his (or her) means of livelihood. The scope and meaning of these expressions will appear from an explanation of three census questions, *viz* :—

Question 9.— ECONOMIC STATUS;

Question 10.— PRINCIPAL MEANS OF LIVELIHOOD ; AND

Question 11.— SECONDARY MEANS OF LIVELIHOOD

(2) FORM OF QUESTIONS :

Question 9.— ECONOMIC STATUS :

Part One.— DEPENDENCY— Write '1' for a self-supporting person, '2' for a non-earning dependent, and '3' for an earning dependent. Write the answer in the first compartment.

Part Two.— EMPLOYMENT— If a self-supporting person earns his principal means of livelihood as an employer write '1'; as an employee write '2'; as an independent worker write '3'. Write 'o' in other cases. Write the answer in the second compartment.

Question 10.— PRINCIPAL MEANS OF LIVELIHOOD :

An answer to this question should be recorded on every slip. If the slip relates to a self-supporting person record his principal means of livelihood. If the slip relates to a dependent (whether

earning or non-earning) record here the principal means of livelihood of the self-supporting person on whom he is dependent. The means of livelihood which provides the largest income is the 'principal means of livelihood' for a self-supporting person who has more than one means of livelihood. In the case of other self-supporting persons it is the only means of livelihood.

Use the following contractions :

Write '1' for a person who cultivates land owned by him; '2' for a person who cultivates land owned by another person ; '3' for a person who is employed as a labourer by another person who cultivates land ; '4' for a person who receives rent in cash or kind in respect of land which is cultivated by another person.

For all other means of livelihood write fully and clearly what the person does in order to earn his livelihood and where he does it.

Question 11.— SECONDARY MEANS OF LIVELIHOOD :

For a self-supporting person who has more than one means of livelihood write the means of livelihood next in importance to his principal means of livelihood. For an earning dependent write the means of livelihood which provides the earning. Use contractions given in *Question 10*.

For a self-supporting person who has only one means of livelihood write 'o'. In the case of a non-earning dependent also, write 'o'.

(3) Question 9.— **ECONOMIC STATUS :

This question is in two parts. The first part requires the labelling of every person as 'a self-supporting person'; or 'an earning dependent' or a 'non-earning dependent'. Every single human being must be allotted one of these labels and not more than one of them, and this may be referred to as his 'household economic status'.

The second part of the question has no application to non-earning dependents or to earning dependents. It relates only to self-supporting persons; and even among them, those exceptional cases of self-supporting persons who support themselves without gainful occupation or economic activity (e.g. rentiers and pensioners) are not covered. All others (that is, all those self-supporting persons who are both economically active and gainfully occupied) are to be allotted one or other of the three labels *viz.*, 'employer'; 'employee'; or 'independent worker'; and this may be referred to as his 'employment status'.

The following extracts from the model-instructions to enumerators explain the criteria to be applied and the treatment of border-line cases :

Where a person is in receipt of an income, and that income is sufficient at least for his own maintenance then he (or she as the case may be) should be regarded as a 'self-supporting person'. Such income may be in cash or kind.

Anyone who is not a 'self-supporting person'; in this sense, is a 'dependent'. A dependent may be either an 'earning dependent' or a 'non-earning dependent'; the test is whether or not he secures a regular income, even though it may be small. Where the income which he secures is not sufficient to support him, that person is an 'earning dependent'. *A person who does not secure any income either in cash or in kind, is a 'non-earning dependent'.*

**The Indian Census Economic Classification Scheme describes two different aspects of economic status which are ascertained by two different parts of question 9 as 'primary economic status' and 'secondary economic status'. It seems preferable to refer to them as 'household economic status' and 'employment status'. The second part of the question was an innovation of the 1951 Census. It was put in, because of insistent demand for the information and in spite of some anxiety about the possibility of its creating confusion similar to the 'industry' question of 1931 and 1941 Censuses, which was abandoned at this census.

Where two or more members of a family house-hold jointly cultivate land and secure an income therefrom, each of them should be regarded as earning a part of the income. None of them is, therefore, a non-earning dependent. Each of them should be classed as either a self-supporting person or an earning dependent according to the share of income attributable to him (or her). The same applies to any other business carried on jointly.

This does not mean that anyone who works is necessarily a self-supporting person or an earning dependent. Thus, for instance, a housewife who cooks for the family brings up the children or manages the household is doing very valuable work. Nevertheless, her economic status is that of a non-earning dependent, if she does not also secure an income.

(An) Employer (is) only that person who has necessarily to employ other persons in order to carry on the business from which he secures his livelihood. A person (who) employs a cook or other person for domestic service should not be recorded as an employer merely for that reason.

Persons employed as managers, superintendents, agents, etc. (who) control other workers are also employees only, and should not be recorded as employers.

An independent worker means a person who is not employed by any one else and who does not also employ anybody else in order to earn his livelihood.

(4) Question 10.— PRINCIPAL MEANS OF LIVELIHOOD:

'Means of livelihood' of any individual ordinarily means the gainful occupation which forms the source from which that income which is utilised for his maintenance is normally derived; but it is more comprehensive, in as much as in exceptional cases, income may be secured without gainful occupation. 'Principal means of livelihood' means the same thing as 'Means of livelihood' for every person who has only one means of livelihood. Where a person has more than one, that which gives him the greater part of his income in his 'Principal means of livelihood'. *In the sense thus defined, every human being, without any exception, has a principal means of*

livelihood—whether or not he is a self-supporting person. Every non-earning dependent is maintained exclusively by the income of some self-supporting person on whom he is dependent. Consequently, the principal means of livelihood of the latter is required to be recorded as the principal means of livelihood of the former. The same rule applies to earning dependents also (no attempt being made to assess the degree of sufficiency of his own income or the extent of his dependence on others).

Agricultural and non-agricultural means of livelihood are distinguished by the manner in which enumerators are required to record the answers to this question. This is important for purposes of subsequent classification of the answers. The following extracts from instructions are relevant :

Four simple contractions have been provided which will cover most cases where the livelihood is dependent on agriculture—Write '1' for a person who cultivates land owned by him ; '2' for a person who cultivates land owned by another person ; '3' for a person who is employed as a labourer by another person who cultivates land ; '4' for a person who receives rent in cash or kind in respect of land which is cultivated by another person. If you find that a person falls under two of these categories note that category which provides the largest income against question 10 and the second against question 11. No note need be taken of more than two such categories in any case.

[NOTE:—The word 'owned', used in relation to land includes every tenure which involves the right to permanent occupancy of land for purposes of cultivation. Such right should be heritable; it may be, but need not necessarily be, also transferable.]

In all other cases.....Write fully and clearly what the person does in order to earn his livelihood and where he does it. There are three lines on the slip provided for answering this question. Use them fully. Avoid vague and general terms. Do not write 'service', or 'labour'. If you are enumerating a trader, describe the articles in which he is carrying on trade and state clearly whether he is a wholesale trader or a retail trader. A retail trader sells to the public. A wholesale trader does not. If you are enumerating a factory worker give the name of the factory, or the product it

makes, e. g., coal mine, jute factory, cotton mill, etc.

(5) *Question 11.*—SECONDARY MEANS OF LIVELIHOOD:

A self-supporting person may or may not have more than one means of livelihood. If he has more than one, that which provides the greatest income is recorded under question 10 as the 'principal means of livelihood' and the next under question 11 as the 'secondary means of livelihood'. It has been laid down that no note should be taken of more than two such means of livelihood in any case.

The answer to this question is invariably 'nil' for non-earning dependents. *Ex-hypothesi* they secure no income; they are supported by the principal means of livelihood of the persons on whom they are dependent which alone is taken to be their only means of livelihood.

In the case of every earning-dependent, there are two means of livelihood which are combined in order to support him. One is the principal means of livelihood of the person on whom he is dependent. The other is the source wherefrom he secures his own income. The former is always to be treated as the 'principal means of livelihood' of the 'earning dependent' ; and the latter as his 'secondary means of livelihood'.

Further elucidation of the scope and implications of these questions was provided in supplementary instructions in the form of question and answer. These are extracted below.

(6) CENSUS QUESTION 9 (1) :

Question.— In the instruction the words are "the test is whether he secures a regular income, even though it may be small." Does the use of the word 'regular' rule out persons who earn an income by seasonal employment ?

Answer.— No. The word 'regular' is used in the sense of 'non-casual'. It is not intended to be confined only to income derived from continuous employment. It also includes income derived from seasonal employment. What it does exclude is individual income accruing casually and not constituting a source of income which is regularly depended upon.

Question.— The word 'self-supporting', as defined in the instructions, means any person whose income is sufficient at least for his own maintenance. *Does this mean that an income sufficient for one*

man is self-supporting income? What about his direct dependents—wife, children etc.?

Answer.—Yes. The instructions mean what they say. A person must be deemed to be self-supporting if his income (such as it is) is sufficient to support him individually at his present level of living (such as it is). He does not cease to be self-supporting merely for the reason that he, his wife and children taken together are not maintained by his own income.

If the wife and children have no income of their own, they are non-earning dependents. The instructions provide that their principal means of livelihood should be deemed in every case to be the same as that of the person on whom they are dependent. This would in most cases be the husband or father who will also be the head of the household. In those exceptional cases where the husband or father is not the head of the household, and is also not able to support anyone but himself, then the head of the household in which the non-earning dependent is living is the person on whom he (or she) is dependent.

Remember—every 'family household' is (collectively) self-supporting; otherwise it would not exist. The surplus of self-supporting persons within a family household is in every case sufficient to meet the deficit on the earning and non-earning dependents in that family household.

Question.—In the instructions it is provided that if two or more members of the family households jointly cultivate land they would be classed as self-supporting or earning dependent "according to the share of income attributable to him or her". How are these shares to be assigned? What about females who, in some cases, take an active part in agricultural operations?

Answer.—The share of the income attributable to a person is what the head of the household (or whoever is the managing member) deems it to be. No attempt should be made to make a detailed calculation of this share. All that has to be ascertained is whether (in the opinion of the head of the household or managing member) the member concerned is entitled to a share which would be sufficient to cover the cost of his own maintenance.

If the answer is 'yes', he is 'self-supporting' if the answer is 'no', he is an 'earning dependent'.

The considerations are exactly the same whether the individual is a male or a female, an adult or a non-adult.

(7) CENSUS QUESTION 9 (2):

Question.—Are doctors and lawyers, who employ compounders and clerks independent workers or employers?

Answer.—They are employers. A doctor employs a compounder in order to relieve him of part of the work connected with the business on which he is engaged and by which he secures his livelihood. A lawyer employs a clerk for a like purpose.

Question.—A money-lender employs four persons to realise interest. Is he an employer or independent worker?

Answer.—He is an employer. He would be an employer even if he employed only one person provided that person was regularly employed and derived his principal means of livelihood by such employment. Casual employment, or part-time employment which does not provide the principal means of livelihood of the person employed, should not be taken into account.

Question.—What is the status of tenants or zamindars who do not cultivate (land) themselves, but employ labourers*?

Answer.—If they employ others they are 'employers'—provided the purpose of the employed and the nature of the employment are as stated in the answers to the two preceding questions.

Question.—What is the status of beggars; orphans in orphanages; convicts in jails?

Answer.—They fall in none of the three categories. Record 'o' for them.

(8) CENSUS QUESTION 10 :

Question.—What is the category of a minor, a blind person or a lady who has land in his or her name but gets it cultivated by labourers. Category I or Category IV?

Answer.—Learn to distinguish between 'cultivation of the land' and 'performance of labour

*In the end, the data regarding employment status were tabulated for self-supporting persons of non-agricultural classes only.

necessary for cultivating the land'. There are, of course, millions of persons who perform both functions—but the functions are distinguishable and should be distinguished. The man who takes the responsible decisions which constitute the direction of the process of cultivation (e.g., when and where to plough, when and what to sow, where and when to reap and so on); it is this person who should be referred to as the cultivator, even though he does not perform any manual labour whatever. The man who ploughs, or sows, or reaps under the directions of someone else is not the cultivator—but a cultivating labourer, a different thing altogether.

The cultivator may be the owner of the land cultivated. In that case he is category I, whether or not he also combines in himself the functions of a cultivating labourer.

Alternatively, the cultivator may be a lessee, an agent or manager (paid or unpaid). Even in this case it is immaterial whether this lessee or agent or manager also combines in himself the functions of a cultivating labourer; he (the cultivator) is category II, and the other person (the owner) is category IV.

Applying these principles, the answer to the question put depends on whether the minor, blind person, or lady does or does not actually direct the process of cultivation. If the person does this, the answer is category I; otherwise the answer is category IV.

(9) 1951 CENSUS — ECONOMIC TABLES :

On the basis of replies to questions 9, 10 and 11, the people have been divided into two broad livelihood categories, viz., the 'agricultural classes' and the 'non-agricultural classes'.

There are four 'agricultural classes', defined as below :

- I—Cultivators of land, wholly or mainly owned; and their dependants;
- II—Cultivators of land, wholly or mainly unowned; and their dependants;
- III—Cultivating labourers; and their dependants; and
- IV—Non-cultivating owners of land; agricultural rent-receivers; and their dependants.

There are four 'non-agricultural classes' defined as comprising all persons (including dependants) who derive their principal means of livelihood from.—

- V—Production (other than cultivation);
- VI—Commerce;
- VII—Transport;
- VIII—Other services and miscellaneous sources.

Livelihood sub-classes—Each of the 8 livelihood classes have been divided into three sub-classes with reference to their household economic status as below:—

- (i) Self-supporting persons;
- (ii) Non-earning dependants; and
- (iii) Earning dependants.

Figures for livelihood categories and classes have been compiled. These are being printed and published in District Census Handbooks—one for each district. Figures for livelihood categories, classes, and sub-classes have been compiled for different 'tracts' within every district—'rural tracts' and 'urban tracts' being kept distinct. At this stage, the figures relating to self-supporting persons of non-agricultural classes in every tract are further broken down under 10 divisions and 88 sub-divisions of industries and services and cross-divided into 'employers', 'employees' and 'independent workers'. All these figures are compiled for district divisions, states, zones and all-India—care being taken to furnish separate figures for the rural population and urban population of every territorial unit. All these statistics are printed as 'Economic Tables' in state census reports for the state concerned, its divisions and districts and in the India volumes; for India, zones, states and natural divisions.

II.—THE CONCEPT OF 'HOUSEHOLD ECONOMIC STATUS' AT SUCCESSIVE CENSUSES

(10) 1881 CENSUS :

The aim at this census was very simple. It was to record the numbers of 'actual workers'

and to classify them according to 'occupations'. The instructions visualize 'actual workers' as being only such persons as "actually do work and contribute to the family income". The instructions went on to explain that "boys at schools, small children and women who perform no regular work were not to be shown at all in the column of actual workers". "Mere employment in such domestic occupations as spinning will not entitle women to be shown in this column unless the produce of their labour is regularly brought to market". It was visualized that an 'actual worker' might have more than one occupation, as where he "combines agriculture with any other profession or trade such as that of vakil, money-lender, carpenter or smith". In such cases both 'occupations' were to be shown.

(11) 1891 CENSUS :

At this census the title underwent a change from mere 'occupation' to 'occupation or means of subsistence'. This change introduced for the first time the concept of classifying every individual without exception with reference to the sector and sub-sector of the national economic life from which he drew sustenance. In consequence, the question was not limited to the 'actual worker' as in 1881, but addressed to everybody. The 'means of subsistence' were recorded for everybody. One consequence of this change was that the distinction which was implicit in the 1881 Census between 'actual workers' and others was lost. "What was the 'occupation' for the actual worker was both 'occupation' and 'means of subsistence' for him; while it was only the 'means of subsistence' for the members of his household who depended on him for their means of subsistence. Hence the alternative form of the title 'occupation or means of subsistence'.

(12) THE NEXT THREE CENSUSES (1901, 1911 & 1921) :

At the 1901 Census, it was realised that while it was necessary to get the information obtained at the 1891 Census, it was also necessary to get the information obtained at the 1881 Census, which was lost in 1891. How many people actually worked in each sector or sub-sector of the national life was at least as important information as how many people in all subsisted on it. It was decided that both types of information

should be collected. Accordingly the 'census schedule' was provided with three separate columns (9, 10 & 11) which were headed thus:

Occupation or means of subsistence of actual workers		Means of subsistence of dependents on actual workers
Principal	Subsidiary	
9	10	11

It was explained that the category of 'actual workers' was intended to cover not only all people who worked for their living but also those people who were in receipt of an income without working—e.g., rent or income from investment or pensions or annuities. The 'dependents' were to be distinguished from 'actual workers' as consisting of "women, children and the old and infirm who rely on others for their support and whose occupation, if they have any, is not sufficiently important materially to augment the family income". Thus a dichotomy of the people according to household economic status was established in 1901 and it remained unaltered during 1911 and 1921 Censuses. The actual terms of the instructions underwent minor changes and finally stood in 1921 as below :

Column 9.—Enter the principal means of livelihood of all persons who actually do work or carry on business whether personally or by means of servants or who live on house-rent, pensions, etc.

Column 10.—Enter here any occupation which the actual worker pursues at any time of the year in addition to his principal occupation.

Column 11.—For children and women and old or infirm persons, who do not work either personally or by means of servants, enter the principal occupation of the person who supports them. [It may be noted that 'subsistence' had become 'livelihood'. The word 'occupation' was used as a synonym for 'means of livelihood' in the case of actual workers. Dependents had a 'means of livelihood', but not an 'occupation'.]

(13) 1931 CENSUS :

It was at this Census that a tripartite division of the people according to household economic status was first attempted. The 'actual worker', of five preceding Censuses became the 'earner'. Among the 'dependents', a distinction was made between 'working dependents' who (though dependent) nevertheless worked and had an 'occupation' and others who had no occupation. The last mentioned group may be referred to as

the 'non-working dependents' (though the questionnaire and instructions did not use this expression). The new name 'earner' was introduced because 'actual worker' had been regarded as the opposite of the 'dependent' and it was now proposed to recognise some dependents as also being workers. (The anomaly involved in including renters and pensioners among 'actual workers' was not however removed by the new name 'earner', which was equally inapposite.) The term 'actual worker' was used in the 1931 Census Report to mean the sum total of earners and working dependents.

(14) 1931 CENSUS.— (continued) :

How exactly was the line to be drawn between the 'earner' and the dependent who was to be classified as 'working dependent' ? How was the working dependent to be distinguished from other dependents ? The answers were settled as follows by instructions :

"Only those women and children will be shown as earners who help to augment the family income by permanent and regular work for which a return is obtained in cash or in kind. A woman who looks after her house and cooks the food is not an earner but a dependent. But a woman who habitually collects and sells firewood is thereby adding to the family income and should be shown as an earner. A woman who regularly assists her husband in his work (e.g., wife of a potter who fetches the clay of which he makes the pots) as an all-time assistant should be shown as an earner, but not one who merely renders a little occasional help. A boy who sometimes looks after his father's cattle is a dependent, but one who is a regular cowherd and earns pay as such in cash or in kind should be recorded as such in column 10. It may be assumed as a rough and ready rule that boys and girls over the age of ten who actually do field labour or tend cattle are adding to the income of their family and should therefore be entered in column 10 or 11 according to whether they earn pay or not. Boys at school or college should be entered as dependents. Dependents who assist in the work of the family and contribute to its support without actually earning wages should be shown as dependents in column 9 and under subsidiary occupation in column 11. Thus a woman who keeps house for her husband is a dependent and entered as such in column 9, but has the subsidiary occupation (column 11) of house keeping.* Similarly weaving is often an important subsidiary occupation for women dependent in Burma and Assam and should be entered in column 11 where, it may or may not, have to take the place of house keeping. Only most important subsidiary occupation should be given.

Domestic servants must be entered as cook, bhisti, etc. in column 10 and not column 9 as dependents.

*This instruction introduced a radical change in pre-existing concepts. It had been well settled at all previous censuses that 'occupation' meant 'gainful occupation' only. The change appears to have been given effect to, even in 1931, only in Madras and Travancore-Cochin ; it was done away with in 1941.

Persons temporarily out of employment should be shown as following their previous occupation."

(15) 1931 CENSUS.— (continued) :

While, on the one hand, these instructions were designed to yield additional information, not secured at previous Censuses, they also resulted in some loss of information formerly secured. It will be recalled that completeness of economic classification of the people [by affiliating everyone (including dependents) uniquely to some sector or other of the national economic life] was an essential feature of the Indian Census, first introduced in 1891 and continued up to 1921. In 1931, this information was lost. This loss was foreseen and accepted; as may be seen from the following extract from the 1931 Census Report. "Misunderstandings are familiar in the Indian census schedule and were the cause of one of the changes in the form of the schedule made at this census." In 1911 and 1921 enumerators were instructed to return in the case of dependents the "occupation on which dependent", an instruction which always gave rise to much misunderstanding and consequently unsatisfactory results. The abandonment of this instruction means that there can be no final distribution of the dependence of the total population on the various occupations derived from the individual returns. But there is no reason to suppose that an estimate of this distribution cannot be attained from an examination of the returns of earners and working dependents, which will be as satisfactory for practical purposes as the one obtained from the incompletely comprehended and unsatisfactory returns of "occupation on which dependent" obtained on previous occasions, for a change was also involved in the instructions that a dependent might be regarded as having an 'occupation'. The last mentioned consideration was evidently regarded as decisive. The need for securing a distinct count of 'working dependents' was first accepted. It was felt that the effort to secure the new information and also to continue to secure the information which would affiliate the dependents to the means of livelihood of the persons on whom they were dependent might cause such confusion in the minds of enumerators, as to vitiate the answers to all the questions.

(16) 1941 CENSUS :

At this census, the 1931 Census conception of household economic status, viz. putting, people

into three groups instead of two was accepted and continued ; but the criteria were modified:

(a) To begin with, the old limitation of the conception of 'occupation' to 'gainful occupation' was restored. The 1931 Census instruction which resulted in the classification of housewives as working dependents in the occupational group 'domestic service' was given up. In order apparently to prevent the possibility of the 'occupation' concept being extended to non-gainful activity and with an eye possibly also to the avoidance of confusion between 'occupational' and 'industrial' classification systems, the very word 'occupation' was dropped. The questionnaire dealt only with 'means of livelihood'.

(b) Under the 1931 Census instructions, it was possible for women who took part as actively as men, in agricultural work, to be classified as 'working dependents' on the ground that they were not in receipt of pay, while boys who earned quite small amounts as pay in cash or kind were classed as 'earners'. The criterion was changed in 1941 and the change was reflected in new names. The census questionnaire referred to persons who were 'wholly dependent' and distinguished them from others who were 'partly dependent'. No name was assigned to the third group, but 'earner' was dropped. A person was 'wholly dependent' if he had "no income in cash or kind". On the other hand, one who "contributes in cash or kind towards the support of the household without being definitely capable of supporting himself" is partly dependent.

(17) 1941 CENSUS.—(continued) :

It was clear from these instructions that if a dependent was in receipt of pay, either in cash or in kind, he (or she) was not automatically to be taken out of the category of dependents, but the test of adequacy for self-support was to be applied. What was to be the position of 'unpaid family helpers' more particularly women who take part actively in the cultivation of the family holding but receive no pay in cash or in kind? Were they to be treated as 'wholly dependent' since, by hypothesis, they had "no income in cash or kind"; or were they to be deemed to be contributing in cash or kind and classified on that basis?

The issue was settled in different ways by local instructions. But the fact that it gave trouble is evident from the following extracts from the correspondence which passed between the

Superintendent of Census Operations, Sind, and the Census Commissioner.

EXTRACT FROM THE LETTER OF THE SUPERINTENDENT OF CENSUS OPERATIONS, SIND DATED THE 25TH OCTOBER, 1940 TO THE CENSUS COMMISSIONER FOR INDIA.

".....I noticed one rather interesting error, which was due partly to the Collector having issued orders which seem to me contrary to the spirit of the instructions. I am confident that my view is right but it is of very considerable general importance.

This is in regard to question 9. In the Instructions to Enumerators which are attached to your printed General Scheme for the Census Part II, the general definition of "partly dependent" is "A person who contributes in cash or kind towards the support of the household *without being definitely capable of supporting himself*"..... "is partly dependent."

One concrete case, out of many observed, was this: The head of a joint family owns a piece of land. He is aged 60 or more. Recorded as zamindar, cultivating himself. He has four adult sons, aged 25, 22, 20 and 19.

These were put down as *totally dependent*: Presumably because the land stood in their father's name and they cultivated it under his directions, contributing nothing but labour.

But these four able-bodied men are obviously quite capable of supporting themselves. If they chose to work as agricultural labourers on somebody else's land, they would naturally be shown as independent. Why then, should the circumstance of their having a father alive, render them "totally dependent", as if they were females, blind, insane, or otherwise incapable of supporting themselves?

I feel that in dealing with the agricultural population, the general assumption should be that all able-bodied young men of 18 and upwards are capable of making their own living. The circumstance of their working on their father's land seems to me to have no more the effect of "dependence", than working in a family firm should have on a young solicitor.....

I hope my view is correct. Perhaps I have laboured the point unnecessarily, but considering the vast number of people in India engaged in agriculture, the effect of showing thousands of able-bodied men as totally dependent on some other agriculturist, through the mere accident of family relationship, would be devastating

EXTRACT FROM THE LETTER FROM THE CENSUS COMMISSIONER FOR INDIA DATED THE 1ST NOVEMBER, 1940 TO THE SUPERINTENDENT OF CENSUS OPERATIONS, SIND.

".....I always knew that our excursions into partial dependency etc., would produce a heavy crop of conundrums and so was not surprised at the emergence of such a one as that brought up in your letter about the Zamindar and his four sons. In census work, however, one has to expect conundrums as a kind of natural phenomenon.

On the actual case, I think it is clear enough that the four men were supporting themselves by labour but I rather hesitate to take your general assumption as stated. Able-bodied young men are no doubt all capable of making

their own living, but our census question is "do they in fact do so? Not all able-bodied young men use their able bodies. You might have for example a zamindar's sons who have been to college and do not work on the land or at all and yet are as able-bodied as anybody else. I think therefore your instruction should rather be couched in the form that partial or complete dependency is a matter of fact in each case; to be settled by the enumerator, where doubt exists, on common sense lines. Thus the four men working on their father's farm and carrying through its operations were clearly earning their living and therefore not dependent. Census officers should be reminded that the definition of partial dependence or independence says nothing about actual specific remuneration...."

(18) 1941 CENSUS.—(contd) :

It will be recalled that the 1931 Census had departed from all earlier censuses since 1891 in failing to affiliate dependents, (through persons on whom they were dependent) to the branch of national economic life from which they derived their means of livelihood. The 1941 Census restored the previous practice in this respect. Thus, the information necessary for affiliating all persons without exception to the appropriate branch of the national economy was secured in addition to the three-fold classification of each individual with reference to his household economic status. [Unfortunately, the results of these enquiries of the 1941 Census were not completely tabulated. Full tabulation was attempted in a few states at that time. Very recently, a two per cent sample of the 1941 Census slips were tabulated for most of the other states. It has not yet been possible to study them from the point of view of behaviour of the sample; nor has it been found possible to put the results together on an all-India basis, in relation to the new territorial limits of states and districts.]

(19) 1951 CENSUS :

The questionnaire and instructions of the 1951 Census were finalised after a discussion in conference with the census superintendents of all states. The following is an extract from the summary of proceedings of that Conference :

"The Conference realised that Questions 9, 10 and 11 of the draft revise were interdependent; that these questions were bound to give difficulty; but the difficulty must be faced in view of the importance of securing economic data. After discussion, it was agreed as a preliminary issue that the classification of every person in one or other of three

categories, viz., 'self-supporting', 'earning dependents', and 'non-earning dependents' should be made.

The question of definition was then taken up. Who was a non-earning dependent was clear enough. There was prolonged discussion on the criterion which should distinguish the 'self-supporting person' from the 'earning dependent'. Three suggestions emerged :

First,— that member of the family who earned or received the largest income should be treated as self-supporting and all others should be treated as earning dependents.

Secondly,— the test should be whether a member of a family would be able to maintain himself as well as those persons who would be necessarily dependent on him, in the event of his separation from the family. If the answer is in the affirmative, then the person is 'self-supporting'. Otherwise he is an 'earning dependent'.

Thirdly,— the test is whether the actual cost of maintaining any particular person was or was not fully covered by his income. If it was, he should be regarded as 'self-supporting'. If it was not, he should be regarded as an 'earning dependent'.

A suggestion was made that, in view of the difficulty of definition, the categories may be reduced to two and everybody classified as either 'earning' or 'non-earning'. It was decided* that this suggestion offered no way out, and it would present a more misleading picture of the resources of the people than a three-category classification, however imperfect the definition.

* The point may be explained as below:—An intermediate group which is gainfully occupied and yet not self-supporting does exist. It is significant in size in all parts of the country. It does not bear a uniform proportion in all parts of the country, either to the self-supporting group or to the dependent group. If it was allowed to be allocated to one or other of the two main groups according to the discretion of enumerators without any definite criteria, the resulting figures would be non-comparable as between different parts of the country. If the intermediate group were to be merged in the self-supporting group everywhere, the resulting figures would be formally comparable; but they would present a distorted and consequent misleading picture of the extent to which gainful employment is provided by different sectors of the national economic life. If the intermediate group were to be merged in the 'dependent' group then all the conceptual difficulties of drawing a line between self-supporting and earning dependents must necessarily be faced and overcome. If they are faced and overcome, we might just as well have the full information in three groups, rather than two.

Finally,—the three criteria were put to vote with the following results :—

Criterion No. I	· 4 in favour
Criterion No. II	· 4 in favour
Criterion No. III	· 7 in favour

The Conference decided to accept Criterion No. III. The Chairman suggested that the requisite definition should be framed by a sub-committee with suitable illustrations. [Note—A sub-committee was appointed, but it could not produce the definitions and illustrations before the Conference ended.]”

The questions and instructions as finally issued, have been reproduced in Section I.

(20) *Basis of Comparison between the 1931 Census and the 1951 Census :*

From what has been said above, the following equations may be regarded as establishing the basis of comparison of the concepts of the 1951 Census and the 1931 Census :—

- I. ‘Non-earning dependents’ of 1951 = ‘non-working dependents’ of 1931 plus about 68 lakhs of ‘house-keeping women’ (classed as working dependents in ‘Domestic Service’ in Madras and Travancore-Cochin).
- II. ‘Earning dependents’ of 1951 = ‘working dependents’ of 1931, minus about 68 lakhs of ‘house-keeping women’ (classed as working dependents in ‘Domestic Service’ in Madras and Travancore-Cochin) plus an unknown number X. [This number X stands for those persons who were classed as ‘earners’ in 1931 because they earned pay, in cash or kind, but whose pay was insufficient even for their own individual upkeep ; such persons are ‘earning dependents’ in 1951.]
- III. ‘Self-supporting persons’ of 1951 = ‘earners’ of 1931 minus the unknown number X (referred to in II above).

III.—AGRICULTURAL CLASSES—DEFINITIONS AND CLASSIFICATIONS.

(21) The ‘Scheme of Occupations’ of the 1931 Census classified ‘occupation’ (then deemed to be synonymous with ‘means of livelihood of earners’) was as follows :

First,—there was a broad division of the national economic life into four classes : A Production of Raw Materials, B Preparation and Supply of Material Substances, C Public Administration and Liberal Arts and D Miscellaneous. The four ‘classes’ were divided into twelve ‘sub-classes’ as below :

<i>A—Production of Raw Materials</i>	<i>B—Preparation and Supply of Material Substances and Liberal Arts</i>	<i>C—Public Administration</i>	<i>D—Miscellaneous</i>
I Exploitation of Animals and Vegetation	III Industry IV Transport V Trade	VI Public Force VII Public Administration	IX Persons living on their means X Domestic service
II Exploitation of Minerals		VIII Professions and Liberal Arts	XI Insufficiently described occupations XII Unproductive

These twelve ‘sub-classes’ were divided into 55 ‘orders’, and further sub-divided into 195 ‘occupational groups’. The first two of the 55 orders were—‘Pasture and Agriculture’ and ‘Fishing and Hunting’. They were parts of sub-class I—‘Exploitation of Animals and Vegetation’. Within the ‘order’ called ‘Pasture and Agriculture’, there were 16 occupational groups, which constituted ‘agriculture’ in a broad sense so as to include not only ordinary cultivation of field crops, but also horticulture, plantation industry, animal husbandry and forestry. Eight out of these groups were however distinguished as sub-order I (a) and termed ‘agriculture proper’, this being strictly limited to ordinary cultivation of field crops.

(22) In view of the overwhelming importance (numerical and otherwise) of ‘agriculture proper’ as thus defined it has been isolated at this census as a distinct livelihood category. All the people who derive their principal means of livelihood from ‘agriculture proper’ are referred to as the ‘agricultural classes’ including not merely

those who cultivate the land or perform labour on cultivation, but also others who are dependent on such persons for their subsistence. All those who do not belong to the 'agricultural classes' are known as the 'non-agricultural classes'. The agricultural classes have been divided into four separate 'livelihood classes' at the 1951 census and are shown below side by side with the eight occupational groups of the 1931 census :

<i>Occupational groups of 1931 Census</i>	<i>Agricultural livelihood classes of 1951 Census</i>
[Under sub-order I (a).]	
1. Non-cultivating proprietors taking rent in money or kind.	I. Cultivators of land wholly or mainly owned and their dependants.
2. Estate agents and Managers of owners.	II. Cultivators of land wholly or mainly unowned and their dependants.
3. Estate agents and managers of Government.	III. Cultivating labourers and their dependants.
4. Rent collectors, clerks, etc.	IV. Non-cultivating owners of land ; agricultural rent receivers and their dependants.
5. Cultivating owners	
6. Tenant cultivators	
7. Agricultural labourers	
8. Cultivators of <i>Jhum</i> , <i>taungya</i> and shifting areas	

The equation between the 'groups' of 1931 and the 'classes' of 1951 must be made with very great care if incorrect and misleading inferences are to be avoided.

23. By far the most important among the occupational groups of 1931 are No. 5—cultivating owners ; and No. 6—tenant cultivators. It may seem to be natural and self evident that the 'cultivating owners' of 1931 should be identical with Livelihood Class I of 1951, and the 'tenant cultivators' of 1931 should be identical with Livelihood Class II of 1951. Actually this is not the case, and it is very necessary that users of census statistics should understand why they are not identical. The following extract from the 1931 Census report will show how the line of demarcation between 'cultivating owners' and 'tenant cultivators' was intended to be drawn :

"A difficulty of definition was also raised by the term 'cultivating owners'. Freehold tenures, as understood in Britain, are conspicuous by their absence in India

generally, and the variety of tenancies and sub-tenancies is legion. A census definition of ownership was found un-expectedly difficult to frame in any simple manner which would be consistent in most provinces, and ultimately ownership was defined as the possession of rights of occupancy, a term which covered all cultivators holding on a lease from Government as well as many others with a conditional or preferential right to their holdings subject to periodic reassessment of rents."

The intention thus expressed was not, however, given effect to consistently.

24. The truth is that a great deal of confusion is caused by the prevalence of different names in different parts of the country which stand for substantially identical tenures and also the prevalence of the same names for tenures which are substantially different. This may be illustrated by the following table which shows the different classes of persons holding land (under different names) in Uttar Pradesh, Bihar and Madhya Pradesh.

UTTAR PRADESH		<i>Area in millions of acres</i>
A. 'Sir' and 'khudkashi'		5·96
B. (1) Hereditary tenants		14·99
(2) Occupancy tenants		10·41
(3) Ex-proprietary tenants and holders of special tenures in Oudh		0·81
(4) Fixed-rate tenants and permanent tenure holders		0·71
		<hr/> 26·92
C. Non-occupancy tenants		0·19
		<hr/> 33·07
BIHAR		
A. (1) Held by proprietors (including <i>zirat</i> and <i>bakashit</i>)		2·12
(2) Held by tenure holders in cultivating possession		1·34
		<hr/> 3·46
B. (1) Occupancy-raiyats other than those paying produce-rents		16·58
(2) Occupancy-raiyats paying produce-rents		2·33
(3) Rent-free holders		0·96
(4) Raiyats holding at fixed rents or rates		0·49
		<hr/> 20·36

C. (1) Non-occupancy-riayats	0.33
(2) Under-riayats	0.33
Total	0.66
TOTAL (A, B, and C)	24.48
Un-occupied	4.25
GRAND TOTAL	28.73

MADHYA PRADESH

A. Held by malguzars ('Sir' and 'khud-kash')	3.87
B. Held by <i>malik-makbuzas</i>	0.85
C. Held by absolute occupancy tenants	2.10
D. Held rent-free subject to rendering village services	0.18
Total	7.00
E. Held by raiyats in-riayatwari village :—	
In the Central Provinces	1.28
In Berar	8.35
Grand Total	16.53

In Bihar, the people who hold lands of the four types classed *B* are called 'raiayats'. Were they the 'owners' of the land they hold or were the zamindars or other 'proprietors' of the estates in which the land was situated to be called the 'owners' of such lands? The answer to this question—whichever way it went—would make a great difference to the statistics of 'cultivating owners' and 'tenant cultivators'. Now, these Bihar raiayats have (and they have had for a very long time) exactly the same rights in those lands as the persons called 'raiayats' in Bombay and Madras. They paid 'rent' to zamindars while their name sakes in Bombay and Madras paid 'land revenue' to the Government. The 'rent' they paid was not necessarily more onerous than the 'land revenue' in Bombay or Madras; not infrequently they were less onerous. More important, the zamindar was *disentitled* to enter on and cultivate the land; that right vested in the 'raiayat'. It would be a curious kind of 'ownership' of agricultural land, which did not carry with it the right to enter on and cultivate the land. Therefore, the zamindar in Bihar no more 'owned' the land held by a 'raiayat' than the Government did in Bombay and Madras. He 'owned' the estate; he might also 'own' some plots of land in the estate; but certainly did not own those lands in the estate which were held by raiayats. From the point of view of rational economic

classification, the raiayats of Bihar should be classed with the raiayats of Bombay and Madras, though in popular parlance the former had (and the latter did not have) a 'landlord'. It is clear from the extract from the 1931 Census Report that the intention was to bring about such a rationalisation of classification. But the Census of India (being a temporary organisation hastily put together on an *ad hoc* basis once every ten years) always works under great handicaps and this excellent intention was not understood and given effect to uniformly.

The people who held lands in Uttar Pradesh (of any of the four type classed *B*) were, in all essential respects, in exactly the same position as the raiayats of Bihar. So also the people who held lands of type *C* in Madhya Pradesh. But the local land laws referred to them as 'tenants'. Were they to be classified, therefore, as 'tenant cultivators' or 'cultivating owners'? Uttar Pradesh classified them as 'Tenant cultivators' while Madhya Pradesh classified them as 'cultivating owners'. The intention of the Census Commissioner was thus defeated.

25. At this census it was decided that a concerted effort should be made to make sure that the intention was correctly carried out. The following is a relevant extract from the proceedings of the First Census Conference :

"The agricultural means of livelihood for which contractions have been indicated in the questionnaire were then taken up. There was discussion as to the exact scope of the various terms used.

It was agreed that the term 'ownership' should be used so as to cover every case where a person had a permanent right of occupancy in the land. It was not essential that this right should include the right of unrestricted transfer. But it should be a heritable right. *It was further agreed that each Superintendent should include in his booklet of instructions, certain illustrations specifying the tenures by their local names and explaining that they are included in the term 'ownership'.*"

26. Occupational Group 7 of 1931, which stands next in importance, is identical with Livelihood Class III of 1951. There is no conceptual distinction between the 'agricultural

labourer' of 1931 and the 'cultivating labourer' of 1951. [But there is a complication arising from the treatment of 'dependents' which will be explained presently.]

27. The Occupational Group I of 1931 is identical with Livelihood Class IV. It should be noted that this includes two quite different types of people who are lumped together in popular parlance as 'landlords' but who do not have the same rights in land. First, there are the 'Zamindars' and other proprietors of 'estates' who receive rent from land in these estates. As explained already such land is not 'owned' by them. Such persons are 'agricultural rent-receivers', falling within Livelihood Class IV; unless they also 'owned' land of the type classed as A in Uttar Pradesh (vide para 18 above) and the income from such lands was more important than the rent on lands of type B. There is another type of people also included in Livelihood Class IV. They are to be found among the people who really 'own' the land—e.g., the raiyats of Bihar, Bombay or Madras, or the occupancy tenants of Uttar Pradesh or the absolute occupancy tenants of Madhya Pradesh, or the excepted types of zamindars and other 'proprietors' of estates referred to above.

If these 'owners' entrusted the responsibility of cultivation to others on a temporary basis, they would be included as 'non-cultivating owners of land' in Livelihood Class IV.

28. There is a very important question as to what is and what is not involved in 'cultivating' the land. One hears very often about the 'tillers of the soil'. Who are they? Is it possible for a person to 'cultivate' the land without performing manual labour? Is a wage-labourer employed by a 'cultivating owner' or tenant cultivator also a 'cultivator'? There had to be a clear cut definition of the term. This was all the more necessary because it was known that in some areas some categories of tenants-at-will or other contractual non-occupancy tenants were returned and classified as 'agricultural labourers', mainly for the reason that they were locally indistinguishable from permanent farm servants and partly in order to avoid giving rise to claims of occupancy right. Hence the special instructions (vide para 10 section I) explaining and emphasising the conceptual distinction between the 'cultivator' (who might be either of Livi-

hood Classes I or II) from the 'cultivating labourer' (Livelihood Class III) on the one hand and the 'non-cultivating owner' (Livelihood Class IV) on the other.

29. The persons included in the 1931 Occupational Groups 2, 3 and 4 (Estate agents or managers, rent collectors, etc.) are insignificant in number. At this census, they were excluded from the agricultural classes altogether and treated as non-agricultural. The distinction implied in 1931 occupational group 8 between 'shifting' cultivation in certain forest areas and ordinary cultivation in settled villages was given up; and this group became merged in Livelihood Class I.

30. One other distinction must be mentioned between the 1931 system and 1951 system of classification of people supported by agriculture. It will be recalled that in 1931 (unlike earlier as well as later censuses) classification was limited to the 'earner' and the 'working dependent', the 'non-working dependent' not being classified at all. In the 1951 Census, all the people, including dependents, have been classified. This gives rise to two differences;

First,—Either the non-earning dependent must be excluded from the 1951 totals, or an estimate for non-working dependents included in the 1931 totals before the two sets of figures may be compared; and

Secondly,—The basis of classification of the working dependent in 1931 was 'occupational'. The significance of this fact is thus explained in the 1931 Census Report: "In 1931, it must be remembered, the working dependents of cultivating owners and tenant cultivators have appeared as dependent workers in the category of agricultural labour; and the proportions, therefore, of agricultural labourers to cultivators is inflated by these figures". These observations were made in the context of a sharp increase in 1931 of the percentage of 'agricultural labourers' in 1931 as compared with 1921, and have equal significance in the present context of a sharp diminution in 1951 of the percentage of the same class.

The treatment of earning dependents at this census is different. Let us suppose that the son of a cultivating owner earns an income by employment as cultivating labourer, but this income is not sufficient for his upkeep. He is then an earning dependent. He is classified as belonging to the 'earning dependent' sub-class of Livelihood Class I—his father's class. If his own means of livelihood, had been sufficient for self-support he would have been classified as a self-supporting person of Livelihood Class III. But, since the boy's employment is not self-supporting, the nature of his employment is relevant only to the classification of 'secondary means of livelihood', and is used for that purpose. But the basic classification of the people into livelihood categories—classes and sub-classes—is based entirely on the 'principal means of livelihood of self-supporting person' only, all dependents (earning and non-earning) being affiliated to appropriate sectors of the national economic life through the self-supporting persons on whom they were dependent.

31. To sum up, the establishment of comparisons between the 1951 Census and the 1931 Census requires much discrimination. In particular, allowance should be made for the unknown number *X* referred to in equations II and III of para 20 Section II, and it should be remembered that there is some difference between the earners of 1931 and the corresponding self-supporting persons of 1951. Subject to this specific reservation the following equations are conceptually valid :

I.—Self-supporting persons of Livelihood Class I to IV of 1951=Earners of 1931 Occupational Groups 1, 5, 6, 7 and 8.

II.—Self-supporting persons of Livelihood Class I of 1951=Earners of 1931 Occupational Groups 5 and 8 plus those earners of 1931 Occupational Group 6 who (as in Uttar Pradesh) were classed as 'tenant cultivators', even though they had a heritable right of occupancy in the land which they cultivated.

III.—Self-supporting persons of Livelihood Class II of 1951=Earners of 1931 Occupational Group 6 minus those among them who (as in Uttar Pradesh) were classed as 'tenant cultivators' even though they had a heritable right of occupancy in the land they cultivated.

IV.—Self-supporting persons of Livelihood Class III of 1951=Earners of 1931 Occupational Group 7.

V.—Self-supporting persons of Livelihood Class IV of 1951=Earners of 1931 Occupational Group I.

VI.—It is *not* to be expected that the numbers of 'earning dependents' of 1951, appearing as sub-classes in each of the four livelihood classes, will correspond to the 'working dependents' of the corresponding 1931 occupational groups, even after allowance is made for the unknown number *X* (vide para 24 section III). But such correspondence is to be expected between the 1931 classification of 'working dependents' and the 1951 classification of 'secondary means of livelihood of earning dependents'.

V.—NON AGRICULTURAL CLASSES—DEFINITIONS AND CLASSIFICATIONS

32. The Classification Scheme of Classes, Sub Classes Orders and Groups referred to in para 23 section III, was first adopted by the Census of India in 1911. It was based on a system devised by Dr. JACQUES BERTILON and approved by the International Statistical Institute. Variations were made from census to census, in the number and scope of occupational groups, but the system as a whole and the identity of larger units remained unchanged.

33. Recently the Statistical Organisation of the United Nations evolved a Scheme of Classification known as the 'International Standard Industrial Classification Scheme'. The Economic and Social Council of the United Nations recommended the use of this Scheme by all Member Governments "either by adopting the system of classification as a national standard, or by re-arranging their statistical data in accordance with that System for purposes of international

comparability". The latter of these two courses has been followed at this Census.

All Industries and Services (other than cultivation) which, as explained already is treated as a category by itself, are divided into ten divisions, *viz.*,

- (0) Primary Industries not elsewhere specified ;
- (1) Mining and quarrying ;
- (2) Processing and Manufacture—foodstuffs, textiles, leather and products thereof ;
- (3) Processing and Manufacture—metals, chemicals and products thereof ;
- (4) Processing and Manufacture not elsewhere specified ;
- (5) Construction and Utilities ;
- (6) Commerce ;
- (7) Transport, Storage and Communications ;
- (8) Health, Education and Public Administration ; and
- (9) Services not elsewhere specified.

These ten divisions have been sub-divided into 88 sub-divisions. The details will be found in the Indian Census Economic Classification Scheme papers which are printed along with the Economic Tables (Part II-B and Part II-C). It is sufficient to observe that statements have been furnished with the help of which it is possible to relate these 'divisions' and 'sub-divisions', on the one hand, to corresponding 'orders' and 'groups' of 1931 ; and, on the other hand, also to the 'divisions' and 'major groups' of the International Standard Industrial Classification Scheme.

34. Comparability of the frame-work of classification has thus been established. This, however, is not enough. It is necessary to secure that the principles adopted for fitting individuals within this frame-work should also be the same. In the first place there is a technical distinction (somewhat confusing to the lay reader) between the 'Industrial' classification and the 'occupational' classification of all gainfully occupied persons. Thus, are all drivers of motor vehicles to be added together and shown under one head ; or the drivers of motor vehicles employed by a factory added to other persons employed by such factory and shown under a head which exhibits the commodities produced by such fac-

tory. The answer indicates the distinction between the 'occupational' and 'industrial' classification. Even when the latter is definitely chosen, there is a further difficulty about the employing unit, whose production is to be the basis of classification. This may be an 'establishment', or it may be an 'enterprise' of which the 'establishment', is a part. The latter was the recommended basis of International Standard Industrial Classification Scheme.

35. The main principles of classification adopted in the Census of India were thus described in 1911 :

"(1) Where a person both makes and sells, he is classed under the industrial head ; the commercial one is reserved for persons engaged in trade pure and simple. On the same principle, when a person extracts some substance, such as saltpetre, from the ground and also refines it, he is shown under the mining and not under the industrial head.

(2) Industrial and trading occupations are divided into two main categories :—

(a) those where the occupation is classified according to the material of which the articles are made, and

(b) those where it is classified according to the use which they serve. As a general rule, the first category is reserved for the manufacture or sale of articles the use of which is not finally determined, but it also includes that of specified articles for which there is no separate head and also the occupations, so common in India, which are characterized by the material used rather than the particular articles made. The ordinary village *mochi*, for instance, makes not only shoes, but also waterbags and all other articles of leather, which he tans himself.

(3) As a general rule, when a man's personal occupation is one which involves special training, *e.g.*, that of a doctor, engineer, surveyor, etc., he is classed under the head reserved for that occupation, irrespective of the agency by which he is employed. A ship's doctor, for instance, is shown as a doctor and not as a ship's officer. An exception is made in cases where the work in which an individual is employed involves further specialization *e.g.*, that of a marine or sanitary engineer. Only those Government servants are shown in sub-class VII who are engaged in the general administrations. Officers of the medical, irrigation, opium, post office and other similar services are classed under the special heads provided for these occupations."

36. The system is similar to that now recommended for purposes of international comparability in that it is based on the principle of 'industrial' classification and not what is technically called 'occupational' classification. But the application of the principle is based, however, not on 'establishments' or 'enterprises'

but on the individual, who is classified. It is on this basis and not on an 'establishment' basis that the 1951 Census data (like all similar data of all earlier censuses) have been tabulated. The following extracts from the papers relating to the I. C. E. C. Scheme explain the decision :

"2. *Unit of Classification.*— Under the I. S. I. C. Scheme, the unit of classification is the organised 'establishment'. The commodity produced or the service performed as a result of the work of the organised establishment is the criterion for classifying the establishment. The classification of the establishments is the classification of every member of the establishment.

Under the present (I. C. E. C.) Scheme the unit of classification is, in every case, the individual. All employers and all independent workers will be classified with reference to the commodity produced or service performed by them individually—this will be same as in the I. S. I. C. Scheme there being no question of an 'establishment' distinct from the individual in these cases.

As regards 'employees', all persons engaged in production, commerce or transport (and not being domestic servants) will be classified under the appropriate sub-divisions with reference to their own activity, and without reference to that of their employer. Domestic servants will all be classed in one sub-division without reference to the nature of their work. All other employees (including all managerial and supervisory employees, clerical services, messengers, watchmen and unskilled labour of every description) will be classified with reference to the commodity produced or service rendered by their employers*.

Thus, there is a technical distinction regarding the unit of classification adopted in the two Schemes. This is unavoidable having regard to the nature of the questions which alone can be put in a general population census in India. Nevertheless, there will be no difference between the two Schemes, except as

regard the allocation of those 'employees' who are individually engaged in activities classifiable as production, commerce or transport, and who are employed in 'establishments' whose main purpose is classifiable differently from the activity of the individual employee.* The Proportion of employees of this kind to the total of all active workers in industries and services (as they are organised at present in India) is unlikely to be large enough to make a significant difference to the comparability of data classified under the two Schemes.

"3. *Economic Tables (B Series).*— The Committee† gave careful consideration to the conceptual basis of the Indian Census Economic Classification Scheme, in relation to that underlying "industrial" and "occupational" classifications as evolved by international agencies ; and came to the following conclusions.

The framework of classification of economic activities under the International Standard Industrial Classification Scheme was relatable to that of the Indian Census Economic Classification Scheme in the manner explained. . . . The differences call for no comment, except that the latter scheme is designed to give a picture of how the people of India actually obtain their means of livelihood and it is, therefore, closer to the actual shape of the economic structure of the country than the international scheme. In order to achieve exact comparability, it is necessary not only that the framework should be relatable, but the basis of fitting the individual within the framework should be the same. The Committee observes that such identity does not exist. This fact is stated in Appendix VI of Memorandum No. II, where a precise description is given of the nature and scope of the differences between the two schemes. The Com-

* When this scheme was finalised, the intention was to apply an "industrial" classification to technically specialised employees as well. There are some reasons to think that this intention might not have been consistently given effect to in all States. But the numbers involved are likely to be small.

† Population Advisory Committee set up by Government of India to advise the Registrar General on technical matters.

mittee discussed this difference fully and formed the opinion.

First,— that the nature of the information procurable in a general population census is such that an exact classification on an “ industrial establishment ” basis is not feasible and, therefore, the difference is unavoidable, and

Secondly,— as stated in Appendix VI, the numbers of persons in respect of whom the difference in the conceptual basis of classification is significant are likely to be relatively small in India, under present conditions of organisation of industrial establishments.

The Committee accordingly approved the scheme as framed and placed on record the following observations :

(i) There is a considerable volume of non-census data available in the form of statutory returns from factories, companies, etc. They provide material which could be drawn upon, where necessary, for labour force statistics classified on “ industrial establishment ” basis in so far as this might differ from the census economic classification.

(ii) There is provision in para 5 of Memorandum No. 1 for ‘ occupational Abstracts ’ for local areas within every district, based on replies to census question 10. The Committee hopes that when these become available, they could be studied with a view to ascertaining how far they provide material for compilation on an ‘ occupational ’ basis, in so far as this might differ from the census economic classification.

PART—B

Review of Data relating to House-hold Economic Status

I.—The 1951 Census picture

(1) Out of 3,569 lakhs, who were counted in the 1951 Census, the economic data relating to 3,566 lakhs were tabulated (those of a little under 3 lakhs in the Punjab have been destroyed by fire). There were 1,832 lakhs of males and 1,734 lakhs of females. They were classified, by house-hold economic status, as shown below :

TABLE 1

	Persons	Males	Females
Self-supporting persons .	1,044	872	172
Earning dependents .	379	134	245
Non-earning dependents .	2,143	826	1,317
Total .	3,566	1,832	1,734

Out of 36 crores of people, over 21 crores do not earn anything nor are they in receipt of any unearned income. If to this number those who procure some income but not enough even for their own upkeep be added, the number increases to 25½ crores. The number of people who procure their own means of livelihood in full

and also support others is very nearly 10½ crores. Within this number, roughly five out of six are men, and the sixth is a woman.

(2) The all-India proportions for the three groups regardless of sex—were 29·3 per cent, 10·6 per cent and 60·1 per cent respectively. The following table shows how these proportions varied among the six zones :

TABLE 2

Zones	Percentage to general population of		
	Self-supporting persons	Earning dependents	Non-earning dependents
North India . .	30·5	12·0	57·5
East India . .	30·8	6·0	63·2
South India . .	26·5	4·9	68·6
West India . .	26·9	15·8	57·3
Central India . .	29·1	20·0	50·9
North-West India .	32·3	12·6	55·1
INDIA . .	29·3	10·6	60·1

The following points may be noted. The variations in the percentage of self-supporting persons range from about nine-tenths of the all-India average (South India) to about eleven-tenths of the all-India average (North-West India). The percentage of earning dependents varies more widely. It is less than half the all-India average in South India and nearly double that average in Central India. One consideration may be set out and dismissed at this stage. It might seem natural that the differences between the zones should be relatable to the differences in age-structure. The following table shows the relevant figures of age-structure :

TABLE 3

Zones	Percentage to general population		
	Persons under age 15	Persons aged 15-54	Persons aged 55 and over
North India . . .	38.5	53.1	8.4
East India . . .	37.9	53.2	8.9
South India . . .	36.9	54.6	8.5
West India . . .	39.5	53.4	7.1
Central India . . .	38.8	53.5	7.7
North-West India . . .	40.5	51.0	8.5
INDIA . . .	38.4	53.3	8.3

By comparing TABLES 2 and 3, it can be easily seen that the differences in age-structure between one zone and another are quite small and they do not help to explain the much more considerable differences in the classification of people by household economic status.

(3) It is evident that the ratios must be very different for men and women. This difference might not be the same in towns and villages. As the zones vary to some extent in sex-ratio and to a still greater extent in respect of the proportion of urban to rural population, it is necessary that we should work out separate ratios for rural

males, urban males, rural females and urban females separately. Hence the following table :

TABLE 4

	Self-supporting persons	Earning dependents	Non-earning dependents
Rural males . . .	47.1	7.9	45.0
Urban males . . .	49.8	4.6	45.6
Rural females . . .	10.4	16.1	73.5
Urban females . . .	7.4	4.5	88.1

We should, now examine whether the ratios for the different zones differ considerably when they are analysed under these four heads separately.

(4) *Rural males*:—The figures for 'rural males are presented below separately.

TABLE 5

Zones	Self-supporting persons	Earning dependents	Non-earning dependents
North India . . .	52.8	6.8	40.4
East India . . .	46.0	6.3	47.7
South India . . .	42.8	4.5	52.7
West India . . .	43.1	10.8	46.1
Central India . . .	48.2	13.6	38.2
North-West India . . .	50.4	10.1	39.5
INDIA . . .	47.1	7.9	45.0

Comparing with TABLE 2 we note the following. The separate ratio for rural males seems to vary among the zones in much the same way as the combined ratio. In both tables, South India stands lowest in self-supporting persons and highest in non-earning dependents, East

India is second highest in non-earning dependents and second lowest in earning dependents ; and Central India is lowest in non-earning dependents and highest in earning dependents. The ratios for rural males are higher in North India, North-West India and Central India than in the other three zones—but in what order ? The order is, as stated, if the zones are arranged in descending order of self-supporting persons. If they are arranged in descending order of non-earning dependents we get exactly the opposite result. Is this an idiosyncrasy of enumeration or is there any real significance in the order indicated by these figures ?

5. Urban males:

The table for 'urban males' is given below :

TABLE 6

Zones	Self-supporting persons	Earning dependents	Non-earning dependent
North India . .	51.7	3.9	44.4
East India . .	55.0	2.4	42.6
South India . .	44.6	4.7	50.7
West India . .	50.9	5.2	43.9
Central India . .	48.7	6.1	45.2
North-West India .	48.9	5.5	45.6
INDIA . .	49.8	4.6	45.6

South India stands again lowest in self-supporting persons and highest in non-earning dependents. East India has arisen to first place, being highest in self-supporting persons and lowest in non-earning dependents. Somewhat surprisingly, North India gets second highest place, beating West India by a few decimal points ; but the position is reversed if the earning dependents are also taken into account in both zones.

The variability between the zones is no wider in self-supporting persons and is noticeably less wide among earning dependents. The relative proportion of earning dependents is, in any event, so small in all zones that the question whether the variations are real or merely reflect idiosyncrasy of enumeration' is of little importance.

6. Rural females :

The rural females are, in the present context, the most disturbing among the four sets of people. This is seen from the table below :

TABLE 7

Zones	Self-supporting persons	Earning dependents	Non-earning dependents
North India . .	6.3	20.4	73.3
East India . .	13.9	6.6	79.5
South India . .	10.4	5.8	83.8
West India . .	6.6	29.9	63.5
Central India . .	9.6	31.3	59.1
North-West India .	13.9	19.7	66.4
INDIA . .	10.4	16.1	73.5

Variations between the zones are obviously large. We saw that a ten per cent margin on either side of the all-India average for self-supporting persons was sufficient to cover the values of all zones in TABLE 2. In this table, we need a forty per cent margin. We had already observed in other tables that the percentage of earning dependents varies more widely than that of self-supporting persons. This feature is reflected in this table also. One fact alone remains unvaried—South India retains, even in this table, the unenviable distinction of having the highest percentage of non-earning dependents among all the Zones.

7. Urban females :

They appear to have the least significance, so far as earning a livelihood is concerned. Here are the figures :

TABLE 8

Zones	Self-supporting persons	Earning dependents	Non-earning dependents
North India . .	4.9	2.7	92.4
East India . .	9.5	1.8	88.7
South India . .	7.9	3.1	89.0
West India . .	7.3	6.9	85.8
Central India . .	7.9	8.2	83.9
North-West India .	6.1	4.2	89.7
INDIA . .	7.4	4.5	88.1

For once, South India falls into second place and North India has the smallest percentage of self-supporting persons and highest percentage of non-earning dependents.

8. These figures indicating differences between different zones raise a question. How far are they comparable with one another (in which case the differences in percentages must reflect real differences in the extent to which the people are gainfully occupied* in different zones) and how far they arise out of mere idiosyncracies of enumeration (in which case the differences signify nothing)? The question arises prominently in relation to the classification of women. The figures for urban females are, as noted already, so small, in any case, that differences do not matter much. Besides, they look consistent. It is the classification of rural females which calls for careful consideration. In India, as a whole, it appears that rather more than one in four of them (26.5 per cent) take part in earning a liveli-

hood, either as self-supporting persons or as earning dependents. The proportion varies from as low as about one-sixth in South India to as high as about two-fifths in Central India. The order among zones is as follows: South India (16.2), East India (20.4), North India (26.7), North-West India (33.7), West India (36.5), and Central India (40.9). Is there really as large a variation as these figures indicate between different parts of the country as regards participation of village women in gainful employment—which means, to all intents and purposes, in the cultivation of land? Or could it be that the enumerators of South India and East India have recorded as non-earning dependents women who do as little work in the fields as those whom the enumerators of West India and Central India have recorded as earning dependents?

The same doubt arises also about another aspect of the difference between the zones which is shown in the TABLE 9.

TABLE 9

Zones	Percentage of rural females who are either self-supporting persons or earning dependents	Ratio between self-supporting persons and earning dependents among 100 rural females who are either self-supporting persons or earning dependents	
		Self-supporting persons	Earning dependents
North India	26.7	24	: 76
East India	20.4	68	: 32
South India	16.2	64	: 36
West India	36.5	18	: 82
Central India	40.9	23	: 77
North-West India	33.7	41	: 59
INDIA	26.5	39	: 61

* It will be seen presently that the number of persons who are self-supporting without being gainfully occupied is so small that they can be ignored.

It is interesting to observe that the six zones fall into three pairs, each with a pattern of its own. East India and south India have the smallest ratio of village women who are gainfully occupied—about one in six in one case and one in five in the other. They have also got the smallest ratio of earning dependents among village women. The number classified as self-supporting is about twice as numerous as those classified as earning dependents.

At the other end we have West India and Central India where the largest ratios of gainfully occupied village women are found. The ratio of earning dependents among them is highest—they are three to four times as numerous as the number classified as self-supporting. North India and North-West India fall in an intermediate category between these two extremes.

9. It is by no means improbable that female participation in field labour does vary very considerably. Differences in seasonal conditions, as well as nature of crop raised, may cause significant differences in the extent to which large number of workers are specially mobilised at certain critical stages of cultivation. Given the same degree of need for such mobilisation, some areas have a normally unemployed surplus of male labour which is available and can be drawn upon even in such critical stages; in others the need cannot be met unless large numbers of women lend a helping hand. Where it is possible to choose whether male or female labour should be drawn upon, the social habits and customs of the cultivating classes may, in some areas, encourage the women freely to take part; while, in others, the cultivators would rather incur the expense of hired labour than to see their women folk working in the fields. For all these reasons, it may be regarded as a reasonable presumption, unless the contrary is proved, that the figures do reflect genuine differences in the participation of village women in gainful employment.

Given such differences, it is easy also to understand that, where the percentage of female participation is low, there the ratio of self-supporting women would be high; for, in these areas, it may be assumed that the women take part in work on much the same terms as the men, more or less throughout the cultivation season and not merely at particular stages of cultivation.

One other circumstance which should be mentioned in this context is the consistency which the figures display when subjected to local review. The State Census Reports contain the results of comparison of the figures on a district or divisional basis. It is found that the differences within each state are not very large; and, where they are observed, they do not seem to be arbitrary but intelligibly related to known differences in economic and social conditions between the districts or natural divisions concerned.

10. At the same time, it must not be overlooked that drawing a line between the self-supporting persons and the earning dependents is, by the very nature of census operations, a rough and ready process. The enumerators do not make income-expenditure calculations—they could not have done it even if they had the time, and they had no time. They were, therefore, instructed to accept the word of the head of the household about whether the work done by the individual in question did or did not suffice to earn his keep. The fact that such a criterion was stipulated and its importance emphasised by instructions—written and oral—in all local languages would have no doubt helped to limit the number of doubtful cases. But a fairly wide margin of doubt must nevertheless have existed. Reports make it clear that it did. In such cases, it is likely that their decision depended, as one Superintendent of Census Operations puts it, on how 'patriarchal' the head of the household felt. More often, perhaps, the local census staff evolved their own rules of thumb for the allocation of marginal cases by reference to age, sex and nature of occupation. Therefore, it is not merely possible but probable that the line between the earning dependent and the self-supporting persons was drawn at somewhat different levels in different states and thus a margin of uncertainty regarding significance of differences might have been introduced. It should be added that these difficulties are not so important in drawing the line between the non-earning dependent and the earning dependent and there should be much less uncertainty regarding comparability of figures of non-earning dependents.

On the whole, it is safe to conclude that the differences in the figures for rural females indicate that corresponding differences do in fact exist in respect of the volume and nature of their participation in gainful occupations—but it is

much less safe to accept the differences between different states in these figures as *exactly measuring* the actual difference.

11. At this stage, it is convenient to effect a simplification of this comparison, by introducing a single yardstick for the measurement of gainful employment which would combine both self-supporting persons and earning dependents on a weighted basis. We know that an average self-supporting person of India supports himself and at least two others, while an earning dependent, by definition, does not secure enough income to support even one person. On a broad average, therefore, we cannot regard one earning dependent as worth more than one-third of one self-supporting person. If, therefore, we define the 'Male Breadwinner Percentage' of any territory as the percentage of self-supporting persons to the total population of that territory plus one-third of the percentage of earning dependents to the total population, we shall get the yardstick we are seeking. The following table shows the 'Male Breadwinner Percentage' of the six zones of India defined in this manner.

TABLE 10

Zones	Male Breadwinner Percentage		
	General	Rural	Urban
North India	54.7	55.0	53.0
East India	49.1	48.1	55.8
South India	44.7	44.3	46.1
West India	48.7	46.7	52.7
Central India	52.4	52.7	50.7
North-West India	53.1	53.8	50.7
INDIA	50.0	49.7	51.3

12. On the basis of TABLE 10, the following conclusions may be stated:

(i) In India as a whole, the male breadwinner percentage turns out to be the round figure of 50.0 per cent. Male breadwinners are slightly more numerous in towns than in villages in the country as a whole—the difference being measured by 1.6 per cent.

(ii) It is clearly shown by the figures that the male breadwinner percentage is highest in North India and lowest in South India. One exceeds the India average and the other falls short of the India average by a margin which clearly exceeds 5 per cent. The zones arranged in order of male breadwinner percentage are: North India, North-West India, Central India, East India, West India and South India.

(iii) The foregoing is also the order among the zones if the villages alone are reckoned. If towns alone are reckoned, the order gets changed as follows: East India, North India, West India, North-West India, Central India, and South India. In East India and West India, the male breadwinner percentage is distinctly larger in towns than in villages. South India also reproduces this feature though less prominently. In the other three zones (North India, North-West India and Central India) the male breadwinner percentage is slightly larger in villages than in towns.

(iv) On almost every kind of reckoning, South India seems to be the last among all the six zones in respect of the prevalence of gainful employment.

II.—Comparison between 1951 and 1931

13. Table 11 compares the household-economic data as ascertained by the 1951 and 1931 Censuses for India and the six zones.

TABLE 11

(NUMBER IN LAKHS)

Zones	1931				1951			
	Total population	Earners	Working dependents	Non-working dependents	Total population	Self-supporting persons	Earning dependents	Non-earning dependents
North India	498	207	34	257	632	193	76	363
East India	700	260	26	414	901	277	54	570
South India	577	214	26	337	756	201	37	518
West India	287	94	22	171	407	109	64	234
Central India	422	169	47	206	523	152	104	267
North-West India	270	91	34	145	350	113	44	193
INDIA	2,754	1,035	189	1,530	3,569	1,045	379	2,145

In constructing this table two adjustments have been made to the figures in published census tables :

(i) Sixty-eight lakhs of women in Madras and Travancore-Cochin who had been classified as working dependents in 1931 under the head 'domestic service' are transferred to and included under the total of 'non-working dependents' of 1931 for South India.

(ii) Three lakhs of people in Punjab (whose 1951 Census records were destroyed by fire) have been allocated (1 lakh as 'self-supporting persons' and 2 lakhs as 'non-earning dependents') in the 1951 figures for North-West India.

14. It will be observed that though the total population of India had increased from 2,754 lakhs in 1931 to 3,569 lakhs in 1951, we have only 1,045 lakhs of 'self-supporting persons' in 1951

against 1,035 lakhs of 'earners' in 1931. The 'self-supporting persons' of 1951 are actually fewer than the 'earners' of 1931 in three zones—North India, South India and Central India. This, however, does not signify much; because, as explained earlier the 'earners' of 1931 include not only all these whom we now call 'self-supporting persons' but also some among those whom we now call 'earning dependents'. For the same reason, we should not also be misled by the large difference in numbers between the 'working dependents' of 1931 (189 lakhs) and the 'earning dependents' of 1951 (379 lakhs).

The true comparison lies between the sum total of earners and working dependents in 1931, and the self-supporting persons and earning dependents in 1951; or, which comes to the same thing, between the non-working dependents of 1931 and non-earning dependents of 1951.

This comparison is shown in TABLE 12.

TABLE 12

Zones	1931 Ratios		1951 Ratios	
	Earners + working dependents	Non- working dependents	Self- supporting persons + earning dependents	Non- earning dependents
North India	48	52	43	57
East India	41	59	37	63
South India	42	58	31	69
West India	40	60	43	57
Central India	51	49	49	51
North-West India	46	54	45	55
INDIA	44	56	40	60

15. If the figures of TABLE 12 may be accepted as correct, they show that in India as a whole non-earning dependency has increased from 56 to 60—a similar increase is observed in all zones except West India; and that the rates of increase in different zones (arranged in order of this increase) are: South India (11 per cent), North India (5 per cent), East India (4 per cent), Central India (2 per cent) and North-West India (1 per cent). The decrease in West India is 3 per cent.

Before proceeding to examine the probable causes of this change, we should make sure that the increase can be accepted as having really occurred. The doubt arises because, as we have already seen, we must allow for the possibility of non-comparable classification of marginal cases in different parts of the country, and the same reason would call for care in comparing the results of two different censuses in the same part of the country.

In these circumstances we cannot be absolutely certain that we are drawing correct inferences from figures; nevertheless the social and economic importance of the phenomena we are examining is such that we ought to try and formulate those conclusions which available data indicate as probable, even though we cannot be certain that their correctness is established beyond doubt.

It has been observed already in relation to comparison between different parts of India, that the line drawn between non-earning dependents and earning dependents is less likely to be materially non-comparable than the line drawn between earning dependents and self-supporting persons. Much the same considerations apply to comparison between the 1951 Census and 1931 Census for the same area. While an increase of say about 2 per cent among non-earning dependents may be regarded as being too small to be asserted as significant—it is hardly likely that a four per cent increase could have arisen by accidental variation. In the circumstances, we may state our conclusions as follows:

Firstly,— It is reasonably certain that non-earning dependency has not decreased but has on the other hand probably increased to some extent in the country as a whole during the twenty years between 1931 and 1951;

Secondly,— There may have been a small increase of non-earning dependency in Central India and North-West India and a small decrease in West India but the evidence in either case is not very definite; and

Thirdly,— It is reasonably certain that non-earning dependency has not decreased but has probably increased to some extent in East

India. A somewhat larger increase of non-earning dependency has occurred in North India and the largest increase among all zones has occurred in South India.

These conclusions cannot (having regard to the nature of the evidence) be asserted as proved beyond all doubt. But we are justified in accepting them as probably what has happened.

(16) Why did non-earning dependency increase? A natural explanation would be forthcoming if there had been a disproportionate increase of women or children. In 1931, there were 951 females per 1,000 males. In 1951, this had become 947 which indicates that the sex-ratio was not a material factor in the country as a whole. In South India, where there is the largest increase of non-earning dependency, the sex-ratio had declined from 1,010 to 999. The largest increase in the sex-ratio took place in North-West India (from 863 to 883) and we see that it is by no means definite that non-earning dependency increased in this zone. We may, therefore, dismiss any changes in the sex-ratio as a probable cause of any significant increase of non-earning dependency. A comparison of age-structure is difficult in view of a great many territorial changes, but sufficient indication is provided by the figures given below for four large states:

TABLE 13

State	Number per 1,000 males who were aged 15 to 54	
	1931	1951
Uttar Pradesh	550	535
Madhya Pradesh	535	539
Bombay	550	543
Madras	533	549
All four states	542	541

In relation to the total population, males of working age have, on the whole, neither increased nor decreased. So this cannot also be a general explanation of a wide-spread increase of non-earning dependency. It seems possible, however, that it may have played some part locally, as for instance, in Uttar Pradesh.

(17) One other reason which might have given rise to an increase of non-earning dependency is the fact that elementary education has been making progress in most parts of the country and it is possible that a considerable number of children who might have been reckoned as 'working dependents' or even as 'earners' in 1931 might have become 'non-earning dependents' in 1951, either because they were going to school, or because the proportion of children who lend a hand in the cultivation of the family holding or otherwise contribute to the income of the family might be smaller among literate children than among illiterate children.

These things are possible. It is even probable that the progress of literacy has had some effect. But it is very difficult to assess the significance of that effect. The following table shows the progress in the percentage of literacy among boys (males aged 5—14) between 1931 and 1951 in a number of states:

TABLE 14

State	Percentage of boys who are literate	
	1931	1951
Uttar Pradesh	5.3	15.4
Bihar-cum-Orissa	4.9	19.2
Madras	9.1	23.3
Mysore	9.6	30.3
Travancore-Cochin	25.8	50.1
Bombay	10.6	34.0
Madhya Pradesh	6.1	20.2
Hyderabad	5.4	13.2

As boys (aged 5—14) number roughly one-eighth of the population and as the progress of literacy among them has been generally well-marked, a sizable diminution of juvenile employment might have occurred, on this account. But it is far from certain that the diminution which did occur was, in fact, sizable. We can not be sure about this unless we had a break-up of literacy data between villages and towns separately for both 1931 and 1951, and also a correlation between literacy, age and gainful employment. We do not possess such data. It is, therefore, very difficult to pass over from the known figures of progress of literacy to any clear conclusions about non-earning dependency.

On the other hand, the need for reserve in drawing what may appear to be a plausible conclusion is indicated by the figures of TABLE II, from which it appears that while 'working dependents' were only 6.9 per cent of the population of India in 1931, 'earning dependents' were 10.6 per cent of the population in 1951. Granted that there were some women and children who were only earning dependents but were classed as 'earners' and omitted from 'working dependents' in 1931—they could have been only a relatively small fraction of the total number of 'working dependents' of 1931. Thus, it is fairly clear that while non-earning dependency has increased, earning dependency (in the strict sense of the 1951 Census) has certainly not declined—and has possibly also increased somewhat during the twenty year period. It is true that this fact does not prove that a selective reduction in the proportion of earning dependents could not have occurred in the age-group 5 to 14, for such a reduction might have occurred and been offset by more than corresponding increase in the older age-groups. On the whole it would seem safe to say that there was sufficient progress in literacy to have had some effect in diminishing juvenile employment. It would not, however, be safe, to attribute the entire increase of non-earning dependency to such cause, or even perhaps a very substantial part of such increase.

18. There is little doubt that the main cause is economic and must be looked for in the circumstance that a very large proportion of the people depend on agriculture and the area of cultivated land did not increase in the same proportion as the population. The area of cultivated land *per capita* has been computed for 1931, by striking the average* for five years preceding 1931 and dividing by the 1931 Census population. It has been computed similarly for 1951 by striking the average* for five years preceding 1951 and dividing by the 1951 Census population. The results are shown below.

(i) NORTH INDIA.—With the exception of one division the area of cultivated land *per capita* has declined in all the divisions of Uttar Pradesh (the only state of this zone).

*Such averages are necessary for purposes of comparison because there is a considerable amount of fluctuation of the area from each year to the next because of the vicissitudes of the seasons.

TABLE 15

Natural division	Area of cultivated land per capita (IN CENTS)	
	1931	1951
East U. P. Plain	63	53
Central U. P. Plain	66	55
West U. P. Plain	77	65
U. P. Hills & Plateau	116	112
Himalayan Uttar Pradesh	54	72
Uttar Pradesh	72	62

The Cultivation Statistics of this state are among the best in India and can be relied on. (As it happens, there is some doubt about the statistics of the one division—Himalayan Uttar Pradesh—where an increase of the area of cultivated land *per capita* is recorded.)

(ii) EAST INDIA.—The figures for states in this zone are of doubtful accuracy. They are shown below for what they are worth :

TABLE 16

State	Area of cultivated land per capita (IN CENTS)	
	1931	1951
Bihar	63	57
Orissa	99	83
West Bengal	43	45
Assam	63	58

As it happens, we know for certain that the increase recorded in West Bengal is incorrect because the Method of estimation of acreage was changed in 1943 so as to render the figures for all preceding years non-comparable with those of succeeding years†.

†Famine Inquiry Commission Report of Bengal pages 147, 206 and 207.

(iii) SOUTH INDIA.—Figures are available for Madras, Mysore and Travancore-Cochin. The cultivation statistics of the first two states are among the best in India. The statistics of Travancore-Cochin are not so reliable.

TABLE 17

Natural division/State	Area of cultivated land per capita (IN CENTS)	
	1931	1951
Madras Deccan	189	147
West Madras	41	33
North Madras	71	55
South Madras	59	44
Madras	72	54
Mysore	99	70
Travancore-Cochin	40	30

The figures show not only the pervasive character of the decline in the area of cultivated land *per capita* in all parts of this zone, but also the larger magnitude of the decline as compared with the two other zones noted already.

(iv) WEST INDIA.—Figures are available only for Bombay. The cultivation statistics of this state are also among the best in India. But, unfortunately, they have been somewhat spoiled by the inclusion shortly before 1951, of large numbers of 'merged' states (which had no good statistics) in almost every district of the state and the difficulty of separating, after merger, the statistics of the newly added areas from those of the old areas. Even so, it is likely that the '*per capita*' figures for 1931 and 1951 are not materially affected and they can be accepted as showing not merely the direction but the magnitude of the change as well. Figures for 1941 (when this complication did not exist) are also furnished

below in order to corroborate the trend disclosed by the figures of 1931 and 1951 :

TABLE 18

Natural division	Area of cultivated land per capita (IN CENTS)		
	1931	1941	1951
Bombay Deccan Northern	202	184	151
Bombay Deccan Southern	231	207	180
Bombay Gujrat	134	108	114
Bombay Konkan	62	59	48
Bombay	156	137	118

It is clear, notwithstanding the statistical difficulty mentioned above (which is prominently visible in Bombay-Gujrat), that the area of cultivated land *per capita* has declined to just as large an extent as in South India, and no less pervasively.

(v) CENTRAL INDIA.—We have figures for only Madhya Pradesh—the other major states (Hyderabad and Madhya Bharat) not having comparable statistics. The Bombay complication has been avoided here as it was possible to separate and exclude the figures for the 'merged' states. The statistics are of the same high order of reliability as in Madras and Uttar Pradesh.

TABLE 19

Natural division	Area of cultivated land per capita (IN CENTS)	
	1931	1951
North-West Madhya Pradesh	171	143
East Madhya Pradesh	128	113
South-West Madhya Pradesh	190	156
Madhya Pradesh	161	135

There is a pervasive decline of the area of cultivated land *per capita*. It is relatively larger than in East India and North India but not so large as in South India or West India.

(vi) NORTH-WEST INDIA.— We have no good statistics for Rajasthan but we have reliable figures for the Punjab. They are furnished below :

TABLE 20

Natural division	Area of cultivated land per capita (IN CENTS)	
	1931	1951
Himalayan Punjab	61	49
Punjab Plains	109	99
Punjab	106	95

There is a decline but it is not so large as even in North India and much less than in Central, South or West India.

(19) These figures establish conclusively and in precise quantitative terms what is generally known or believed to be true—that the extension of cultivation has failed to keep pace with the growth of population in almost every part of the country. There has been a substantial and pervasive decline of the area of cultivated land *per capita* throughout the country. The extent of decline has varied from one part of the country to another. The severity of the decline is notable in South India where the increase of non-earning dependency has also been heaviest. But, we observe, that the decline is no less severe in West India. Why was there no increase of non-earning dependency there? The answer seems to be as follows :

A significant decline in the area of cultivated land *per capita* may be met by the people who work on such land and subsist on its produce in different ways.

First.— They may transfer themselves to non-agricultural employment. Where this occurs,

non-agricultural employment must have increased at a faster rate than the growth of population; and the fall may be evidenced by a diminution in the relative proportion of gainfully occupied persons who are working in agriculture, as well as of the proportion of the total population which subsists on agriculture.

Secondly.— They may continue to work on the land, but in increased numbers on the same area of cultivated land. This means, really, an increase of under-employment on the land. Where this occurs, the fact might be evidenced by an increase in the percentage of earning dependents—if these are classified in the strict sense of the 1951 Census.

Thirdly.— The proportion of people who are not gainfully occupied, but depend on others to maintain them, may increase. In other words, there may be an increase of general unemployment. Where this occurs, it will be reflected in an increase of non-earning dependency (without a corresponding increase in the proportion of women and children).

The main answer thus, to the question why South India shows a reaction of the third type mentioned above so prominently, while it is absent in West India must presumably be found in the differences between the two zones in respect of the growth of non-agricultural employment. Whether there is also a difference between the two in respect of increased under-employment on the land must also be a matter for investigation. We may conclude that the increase of non-earning dependency during the last 20 years in the country as a whole, as well as in four of its six zones, is the consequence mainly of the decline in the area of cultivated land per capita. The extent of increase is not necessarily in strict proportion to the amount of the decline, because it is likely to have been affected in part by the extent to which non-agricultural employment has increased and in part, by the extent to which agricultural under-employment has increased. In the next part of this note we shall examine how far this view is supported by the figures relating to changes in agricultural class structure.

PART C

Review of Data relating to Agriculture

I.—THE 1951 CENSUS PICTURE

1. The total strength of the 'agricultural classes' in India was 2,491 lakhs out of a classified population of 3,566 lakhs. They should not be identified with the 'rural population'. Some members of the agricultural classes live in towns—especially the smaller towns. There is a sizable proportion of people living in villages who get their livelihood from some industry or service other than cultivation and are therefore classified as 'non-agricultural classes'. The following table shows the comparison between the members of the 'rural population' and the 'agricultural classes' in India and the zones:

TABLE I
(IN LAKHS)

Zones	General Popula- tion	Rural Popula- tion	Agricul- tural classes
North India . . .	632	546	469
East India . . .	901	802	681
South India . . .	756	607	486
West India . . .	407	280	243
Central India . . .	523	440	383
North-West India . . .	350	275	229
INDIA . . .	3,569	2,950	2,491*

2. Whereas the rural population is 82.7 per cent of the general population, the agricultural classes number 69.8 per cent of the general population. The percentage of agricultural classes is highest in East India (75.6) and lowest in West India (59.7). The percentages in other zones, in order, are: 74.2 in North India, 73.2 in Central India, 66.0 in North-West India and 64.3 in South India.

The agricultural classes exceed 80.0 per cent of the population in the following divisions:

*The total population of agricultural classes for India is 2,491 by adding up the zonal figures, while the figures arrived at by adding up the numbers in Livelihood Classes I, II, III & IV, is 2,490 *vide* TABLE 2. The difference is due to rounding of figures when taking the population in lakhs.

NORTH INDIA.— East Uttar Pradesh Plain.

EAST INDIA.—All the three divisions of Bihar, the Inland division of Orissa, Assam Hills, Manipur and Sikkim.

CENTRAL INDIA.— East Madhya Pradesh, Madhya Bharat Hills and Vindhya Pradesh.

NORTH-WEST INDIA.— Himalayan Punjab, Himachal Pradesh and Bilaspur.

The Agricultural Classes fall short of 60.0 per cent of the population in the following divisions (apart from Delhi, Ajmer & Greater Bombay):

EAST INDIA.— Himalayan West Bengal and West Bengal Plain.

SOUTH INDIA.— West Madras, Travancore-Cochin and Coorg.

WEST INDIA.— Saurashtra and Kutch.

3. Agricultural classes (it has already been explained) include not only those who are gainfully employed on cultivation, but also all persons who are supported by income derived from the cultivation of land and all other persons who depend on such persons for their subsistence. If we compare the agricultural classes with the general population in respect of household economic status, the result is:

	Percentage to general popula- tion	Percentage to agricul- tural classes
Self-supporting persons	29.3	28.5
Earning dependents	10.6	12.5
Non-earning dependents	60.1	59.0
TOTAL	100.0	100.0

There is a small deficiency of self-supporting persons (0.8 per cent). This is observable in all zones except North-West India—North India (0.8), East India (1.6), South India (0.6), West India (2.4), Central India (0.3). In North-West India the percentage of self-supporting persons

of agricultural classes *exceeds* that of the general population by 1·3 per cent.

In every zone, the percentage of earning dependents of members of agricultural classes *exceeds* that of the general population.

In the result, the percentage of non-earning dependents is higher among agricultural classes than in the general population in two zones—East India (1·0) and South India (0·4). The percentage of non-earning dependents is lower among agricultural classes in the other four zones and the differences being as follows: North India (1·4), West India (3·1), Central India (2·5), and North-West India (4·1).

4. The members of the agricultural classes (numbering 2,490 lakhs) have been divided into four classes as below:

TABLE 2

Livelihood Class	Number (IN LAKHS)	Percentage of agricultural classes	Percentage of general population
I	1,673	67·2	46·9
II	316	12·7	8·9
III	448	18·0	12·6
IV	53	2·1	1·5
TOTAL	2,490*	100·0	69·9

This table brings out three features of agricultural class structure which are important and not always fully appreciated:

First.—*The numerical insignificance of agricultural rentiers.* Livelihood Class IV consists, as already explained, of two distinct sets of people—one set of people are those who 'own' land in the sense of having a permanent and heritable right to occupy and cultivate it but who entrust the cultivation to others and subsist on the rent received from the tenant-cultivator. The other set of people consists of people who are proprietors of zamindaris or other estates, and in that capacity are entitled to receive

*See footnote under Para 1.

rent from the owners of land situated in such estates, in the same way as Government receive land revenue from the owners of land in raiyatwari villages which are not parts of estates. The first set of people can be found in all parts of the country while the second set of people can only be found in those parts of country where zamindari or other similar estates exist. It is not necessary to suppose that all these people are 'landlords' in the sense of being very rich persons—they comprise people drawn from all income groups. All such people form only 1·5 per cent of the general population and 2·1 per cent of the agricultural classes in India.

Secondly.—*The high ratio of 'cultivators' to 'cultivating labourers'.* Livelihood Classes I and II consist of cultivators (and their dependents). They undertake the responsibility of cultivating and their income consists of the net profits of cultivation. They are self-employed persons. Livelihood Class III, on the other hand, consists of a different set of people *viz.*, cultivating labourers (and their dependents). The cultivating labourers do not undertake the responsibility of cultivation—they do the work allotted to them by the cultivators who employ them. They are employees—and their income consists of agricultural wages.

The 1951 Census shows that in India cultivators (and their dependents) comprise 55·8 per cent of the general population (or 79·9 per cent of the agricultural classes); while cultivating labourers number only 12·6 per cent of the general population (or 18·0 per cent of the agricultural classes). The ratio between the two—cultivators and cultivating labourers—(inclusive of dependents) is 82:18.

It is often believed that cultivating labourers are much more numerous than this; and, as a superficial comparison with the 1931 Census might lend some support to the view that the numbers are probably understated at the present census, the figures have been studied thoroughly. The outcome of this study may be stated at once—the figures given above represent a true picture of the present position in India.

Thirdly.—*The high ratio of 'owner cultivators' to 'tenant-cultivators'.* Livelihood Class I

consists of all people whose main source of income is the cultivation of land owned by them. They include people who *also* cultivate rented land in addition to their own. In such case the income from rented land is less important than the income from owned land. On the other hand, Livelihood Class II consists of all people whose main source of income is the cultivation of land rented from someone else who owns the land. Such persons may also own and cultivate small patches of land, but if the income derived therefrom is less important than the income from rented land, they are placed in Livelihood Class II. (We shall refer to these as 'owner-cultivators' and 'tenant cultivators' the names being convenient. But it should be clearly remembered that a great many people are called 'tenants' but yet they possess a permanent and heritable right of occupancy in the land they hold. Such people are classified as 'owner-cultivators' and *not* as 'tenant-cultivators').

The 1951 Census figures show that, in the country as a whole the ratio of owner-cultivators to tenant-cultivators is 84:16.

We shall now proceed to examine the figures zone by zone, in order to see how these three main features are reproduced.

4. NORTH INDIA.—The numbers and percentages of the four agricultural classes in North India are as shown below :

TABLE 3

Livelihood Class	Number (IN LAKHS)	Percentage of agricultural classes	Percentage of general population
I	394	83.9	62.3
II	32	7.0	5.2
III	36	7.7	5.7
IV	7	1.4	1.0
TOTAL	469	100.0	74.2

The figures show that all the three features mentioned about India are prominently emphasized in North India. Agricultural rentiers are only 1.0 per cent which is distinctly smaller than the India figures which are themselves very small.

The zonal ratio of cultivators to cultivating labourers is higher than the India ratio ; it is 92:8, against India's 82:18.

The zonal ratio of owner-cultivators to tenant-cultivators is also higher than the India ratio ; it is 92:8, against India's 84:16.

The following table shows how these three features vary in the different divisions of North India :

TABLE 4

Natural division	Percentage of agricultural rentiers	Ratio of Cultivators to cultivating labourers	Ratio of owner-cultivators to tenant-cultivators
East U. P. Plain	0.7	92:8	91:9
Central U.P. Plain	1.8	93:7	92:8
West U. P. Plain	2.0	92:8	94:6
U. P. Hills & Plateau	1.7	85:15	88:12
Himalayan U. P.	0.3	99:1	94:6

Himalayan Uttar Pradesh is remarkable for its virtual absence of agricultural rentiers and cultivating labourers. On the other hand, U.P. Hills and Plateau division is distinguishable from the rest of Uttar Pradesh in having somewhat larger numbers of cultivating labourers as well as tenant cultivators. Even in this division, however, their proportions are well below the India averages.

5. EAST INDIA.—The numbers and percentages of the agricultural classes of East India are shown below :

TABLE 5

Livelihood Class	Number (IN LAKHS)	Percentage of agricultural classes	Percentage of general population
I	451	66.2	50.0
II	85	12.4	9.4
III	138	20.3	15.4
IV	7	1.1	0.8
TOTAL	681	100.0	75.6

Agricultural rentiers are even fewer in East India than in North India—the proportion is about one-half of the India figures.

But cultivating labourers and tenant-cultivators are clearly more numerous than in North India and close to the India average.

The zonal ratio of cultivators to cultivating labourers is 79:21; while that of owner-cultivators to tenant-cultivators is 84:16.

There are fairly wide variations among the different divisions of this zone, as may be seen from the table below :

TABLE 6

Natural division	Percentage of agricultural rentiers to agricultural classes		Ratio of owner-cultivators to cultivating labourers		Ratio of owner-cultivators to tenant-cultivators	
	Percentage of agricultural rentiers to agricultural classes	Ratio of cultivators to cultivating labourers	Ratio of owner-cultivators to cultivating labourers	Ratio of owner-cultivators to tenant-cultivators	Ratio of owner-cultivators to tenant-cultivators	Ratio of owner-cultivators to tenant-cultivators
North Bihar	0.6	67:33	81:19			
South Bihar	1.1	71:29	85:15			
Chhota Nagpur	0.5	91:9	97:3			
Orissa Inland	0.9	84:16	94:6			
Orissa Coastal	3.2	84:16	87:13			
West Bengal Plain	1.1	77:23	75:25			
Himalayan W. Bengal	0.7	94:6	58:42			
Sikkim . . . . .	...	100:0	92:8			
Assam Plains	1.4	98:2	79:21			
Assam Hills	0.6	97:3	95:5			
Manipur	2.4	100:0	88:12			
Tripura	2.5	93:7	87:13			

North Bihar, and West Bengal Plain stand out in this zone, with distinctly larger numbers of cultivating labourers and tenant-cultivators than the India average. South Bihar has a high proportion of cultivating labourers ; and Himalayan West Bengal has an unusually high propor-

tion of tenant-cultivators together with a very low proportion of cultivating labourers.

In Assam, cultivating labourers are negligible in number both in the Plains and the Hills. But where as tenant cultivators are also negligible in the Hills—they are quite considerable in the plains.

6. SOUTH INDIA.—The numbers and percentages of agricultural classes in South India are shown below :

TABLE 7

Livelihood Class	Number (IN LAKHS)	Percentage of agricultural classes	Percentage of general population
I	275	56.6	36.3
II	66	13.5	8.7
III	129	26.6	17.1
IV	16	3.3	2.1
TOTAL	486	100.0	64.2

The agricultural class structure in South India, it is evident, differs sharply from North India and even East India. Whereas agricultural classes, as a whole, are nearly three-fourths of the general population in North India and East India, they are less than two-thirds in South India. Whereas owner-cultivators numbered over three-fifths of the general population in North India and one-half in East India, they are little more than one-third of the general population in South India. Nevertheless, it should be noted that even in South India, the owner-cultivators form an absolute majority among the agricultural classes. They are clearly more numerous than tenant-cultivators, cultivating labourers and agricultural rentiers taken together. The agricultural rentiers are small in number; though the percentage is somewhat higher than India's verage.

The zonal ratio of cultivators to cultivating labourers is 73:27, which is distinctly smaller

than India's 82 : 18 and very different from North India's 92 : 8. The zonal ratio of owner-cultivators to tenant-cultivators is 81 : 19, which is slightly lower than India's 84 : 16, and much smaller than North India's 92 : 8.

The pattern within the zone is far from uniform. It varies among different divisions as shown below :

TABLE 8

Natural division	Percentage of agricultural rentiers to agricultural classes	Ratio of cultivators to cultivating labourers	Ratio of owner-cultivators to tenant-cultivators
	Mysore	4.1	90:10	92:8
Madras Deccan.	3.9	79:21	90:10
North Madras	3.4	67:33	83:17
South Madras	3.0	74:26	82:18
West Madras	4.5	60:40	26:74
Travancore-Cochin	2.3	62:38	79:21
Coorg	5.4	80:20	77:23

Mysore stands apart with very low proportions both of tenant-cultivators and cultivating labourers; but (curiously enough) it has second highest proportion in the zone, of agricultural rentiers.

Otherwise, all the divisions are conspicuous in having a fairly high proportion of cultivating labourers—the North Bihar proportion (the highest in East India being equalled or exceeded in North Madras, Travancore-Cochin and West Madras). West Madras is altogether exceptional not only because it has the highest proportion of cultivating labourers but also because its 'tenant-cultivators' outnumber its owner-cultivators by nearly three to one. With the doubtful exception of Himalayan West Bengal, there is no division in any of the three zones so far reviewed, with an agriculture class structure even remotely resemble in West Madras. The figures point clearly to a peculiarity in the land tenure system.

7. WEST INDIA.—The numbers and percentages of the agricultural classes in West India are shown below :

TABLE 9

Livelihood Class	Number (IN LAKHS)	Percentage of agricultural classes	Percentage of general population
I	162	66.6	39.8
II	39	16.0	9.5
III	34	14.1	8.4
IV	8	3.3	2.0
TOTAL	243	100.0	59.7

The agricultural classes, on the whole, are just under three-fifths of the general population—the smallest proportion among all the six zones of India.

As usual, agricultural rentiers are quite small in relative number. The zonal ratio of cultivators to cultivating labourers is 85 : 15, which is rather higher than India's 82 : 18, though not quite so high as North India's 92 : 8.

The zonal ratio of owner-cultivators to tenant-cultivators is 81 : 19 which is the same as that of South India.

The variations within the zone are shown below :

TABLE 10

Natural division	Percentage of agricultural rentiers to agricultural classes	Ratio of cultivators to cultivating labourers	Ratio of owner-cultivators to tenant-cultivators
Bombay Deccan	2.9	84:16	93:7
Northern			
Bombay Deccan			
Southern	4.4	78:22	81:19
Bombay-Konkan	2.5	92:8	49:51
Greater Bombay	34.3	74:26	67:33
Bombay-Gujrat	3.3	86:14	81:19
Saurashtra	3.8	92:8	80:20
Kutch	3.8	93:7	74:26

The figures of Greater Bombay are freakish—naturally so, because they relate to one-half of one per cent of the population of a large city. The other divisions call for the following comments. Cultivating labourers are found in relatively large numbers in the Southern division of Bombay Deccan; and they are notably small in numbers in Bombay-Konkan, Saurashtra and Kutch. The tenant-cultivators are on the high side in all divisions except Bombay Deccan Northern. They are exceptionally numerous in Bombay-Konkan recalling in this respect the position in West Madras and Himalayan West Bengal. A peculiarity of the local land tenure system is clearly indicated.

8. CENTRAL INDIA.—The numbers and percentages of the agricultural classes of this Zone are shown below :

TABLE 11

Livelihood Class	Number (IN LAKHS)	Percentage of agricul- tural classes	Percentage of general popula- tion
I	248	64.7	47.3
II	34	9.0	6.6
III	92	24.0	17.6
IV	9	2.3	1.7
TOTAL	383	100.0	73.2

In this zone, the over-all proportion of agricultural classes to general population is high, nearly three-fourths—the zone ranks next after East India and North India.

As in all other zones, the agricultural rentiers are small in number. The zonal ratio of cultivators to cultivating labourers is low 75 : 25 (almost the same as in South India). But the zonal ratio of owner-cultivators to tenant-cultivators is high 88 : 12.

Within the zone the variations are as follows:

TABLE 12

Natural division	Percentage of agricul- tural rentiers to agricul- tural classes	Ratio of cultivators to cultivating labourers	Ratio of owner- cultivators to tenant cultivators
Madhya Pradesh			
North-West	2.8	75:25	91:9
East	1.3	80:20	95:5
South-West	3.4	53:47	80:20
Hyderabad			
North	4.3	70:30	90:10
South	3.1	76:24	82:18
Madhya Bharat			
Hills	1.1	85:15	90:10
Plateau	1.4	81:19	84:16
Lowland	0.9	95:5	75:25
Vindhya Pradesh	0.6	80:20	91:9
Bhopal	1.8	69:31	84:16

The general pattern of Central India is fairly uniformly distributed over all divisions. South West Madhya Pradesh, however, stands out with an exceptionally high proportion of cultivating labourers. The very low proportion of tenant-cultivators in East Madhya Pradesh is also, a notable feature.

9. NORTH-WEST INDIA.—The numbers and percentages of the agricultural classes of North-West India are shown below :

TABLE 13

Livelihood Class	Number (IN LAKHS)	Percentage of agricul- tural Classes	Percentage of general popula- tion
I	144	63.0	41.5
II	60	26.2	17.3
III	19	8.1	5.4
IV	6	2.7	1.8
TOTAL	229	100.0	66.0

The agricultural rentier percentage is, as usual, low. The zonal ratio of cultivators to cultivating labourers is high 92 : 8, the same as in North India. The zonal ratio of owner-cultivators to tenant-cultivators is rather low being 71 : 29.

[It should be mentioned here that the ratio should normally have been higher; but it is temporarily depressed as a result of mass migration of population in this zone; the displaced persons newly settled on the land, not having acquired permanent and heritable rights].

The variations within the zone are shown below :

TABLE 14.

Natural division	Percentage of agricultural rentiers to agricultural classes		Ratio of owner cultivators to tenant cultivators
	Ratio of cultivators to cultivating labourers	Ratio of owner cultivators to tenant cultivators	
East Rajasthan Plain .	2.3	97:3	67:33
Rajasthan Dry Area .	1.5	95:5	38:62
Rajasthan Hills .	2.3	97:3	92:8
Rajasthan Plateau .	3.7	89:11	95:5
Himalayan Punjab .	2.0	98:2	89:11
Punjab Plain .	3.4	86:14	68:32
Himachal Pradesh and Bilaspur .	1.1	99:1	92:8
PEPSU .	3.2	85:15	81:19
Delhi .	3.3	82:18	88:12
Ajmer .	4.4	93:7	92:8

The virtual absence of cultivating labourers in Himalayan Punjab and Himachal Pradesh and Bilaspur (as in the other Himalayan divisions already noticed *vide* TABLES 4 and 6) in this zone, is matched by a similar phenomenon in the Rajasthan Dry Area, Ajmer, Eastern Rajasthan Plain and the Rajasthan Hills. The low ratios of owner-cultivators to tenant-cultivators in two of these divisions point to a peculiarity of the land

tenure system similar to West Madras, Bombay-Konkan and Himalayan West Bengal.

10. *Percentage of Agricultural Rentiers:* In the country as a whole, agricultural rentiers including dependents are only 2.1 per cent of agricultural classes and, naturally a still smaller percentage (1/5 of the general population). If we ignore the figure for Greater Bombay (which is obviously exceptional), we find that the highest divisional value recorded for this percentage is 4.5 in West Madras. Other divisions with an agricultural rentier percentage between 4.0 and 4.5 are Mysore in South India, Bombay Deccan Southern in West India, North Hyderabad in Central India and Ajmer in North-West India. There are none in East India and North India. The fact should be stressed because East India consists mostly of permanently settled zamindaris and North India of temporarily settled zamindaris. If we look for divisions where the percentage of agricultural rentiers is 1.0 per cent or less, we find them to be: East Uttar Pradesh Plain and Himalayan Uttar Pradesh in North India; North Bihar, Chhota Nagpur, Orissa Inland, Himalayan West Bengal and Assam Hills in East India; Vindhya Pradesh and Madhya Bharat Lowland in Central India; and none in South India, West India or North-West India.

11. *Ratio of cultivators to cultivating labourers:*

In the country as a whole there are 82 cultivators (including dependents) for 18 cultivating labourers (including dependents). Let us define a high ratio as meaning 90 or more cultivators to every 10 cultivating labourers or less; and low ratio as meaning 75 or less cultivators to every 25 cultivating labourers or more.

Then we have the following divisions of India with high ratio of cultivators to cultivating labourers.

Four divisions out of five in North India (the exception being Uttar Pradesh Hills and Plateau); Chhota Nagpur, and the Himalayan divisions, of East India (i. e., Himalayan West Bengal, Sikkim, both divisions of Assam, Manipur and Tripura), Mysore in South India; Bombay-Konkan, Saurashtra and Kutch in West India; only one division of Central India *viz.*, Madhya Bharat Lowland; and six divisions of North-West India *viz.*, Himalayan Punjab, Himachal Pradesh and Bilaspur, Ajmer, East Rajasthan Plain.

Rajasthan Dry Area and Rajasthan Hills. As regards divisions with a low ratio of cultivators to cultivating labourers there are none in North India, North-West India or (with the insignificant exception of Greater Bombay), in West India. In the other zones a low ratio is found in North Bihar and South Bihar in East India; North Madras, South Madras, West Madras and Travancore-Cochin in South India; North Hyderabad (South Hyderabad is on the margin), South-West Madhya Pradesh, North-West Madhya Pradesh, and Bhopal in Central India. The lowest ratio among all the divisions in India is found in South-West Madhya Pradesh (53:47), the next two being West Madras (60:40) and Travancore-Cochin (62:38).

12. *Ratio of owner-cultivators to tenant-cultivators*; In the country as a whole, there are 84 owner cultivators (with dependents) to 16 tenant-cultivators (with dependents).

We may, in this case also, define a ratio of 90 or more owner-cultivators to 10 or less tenant-cultivators as a high ratio; and 75 or less owner-cultivators to 25 or more tenant-cultivators as a low ratio. Then we find high ratios prevailing in the following divisions. All divisions of North India, except Uttar Pradesh Hills and Plateau (they also have a high ratio of cultivators to cultivating labourers); Chhota Nagpur, Orissa Inland, Sikkim and Assam Hills in East India; Mysore and Madras Deccan in South India; Bombay Deccan Northern in West India; North-West Madhya Pradesh, East Madhya Pradesh, North Hyderabad, Madhya Bharat Hills and Vindhya Pradesh in Central India; Rajasthan Hills, Rajasthan Plateau, Ajmer and Himachal Pradesh and Bilaspur in North-West India.

There are no divisions in North India with a low ratio of owner-cultivators to tenant-cultivators. A low ratio is found in West Bengal Plain as well as Himalayan West Bengal in East India; West Madras in South India; Kutch, Greater Bombay and Bombay-Konkan in West India; Madhya Bharat Lowland in Central India; and the following divisions of North-West India *viz.*, Punjab Plains (which, as mentioned already, is an exceptional temporary phenomenon), East Rajasthan Plains and Rajasthan Dry Area.

13. What do the observed differences of agricultural class structure in different divisions of India signify? Do they indicate any correlation with the population characteristics of different divisions? It is not possible to answer these questions conclusively without more detailed and prolonged study. The following comments may, however, be made.

First,—It may be thought, on a *priori* grounds, that the greater the density of settlement of the population on the lands the stronger must be the tendency to sublet the land for cultivation, or to employ hired labour in large numbers or both. Such a view might, at least, be regarded as justifiable if the pressure of population on land is measured by some more refined index than crude density—such an index, for instance, as the proportion of actual usage of usable land.

The figures lend little support to the opinion that any such correlation exists. There is no doubt that the pressure of population on land must exert some such effect, but it seems to be relatively less important than the consequences of the working of laws, administrative practices and established customs which define land tenure.

Secondly,—There appears to be a very widespread misunderstanding of the real nature of the distinction between the three main land-tenure systems of the country—the raiyatwari system, the temporarily settled zamindari system and the permanently settled zamindari system; and between all three of them and other minor systems of local importance. It is, for instance, often supposed that the zamindari estates (now in process of acquisition by the State in many parts of the country) comprised very large areas of cultivated land, whose disposition was in the hands of 'landlords' who employed large masses of ill-paid labourers to cultivate them or let them out, according to their will and pleasure, to rack-rented tenants who had no security of tenure. It would be natural, on this quite erroneous view, to look for a high proportion of agricultural rentiers, a small ratio of owner-cultivators to tenant-cultivators and an equally small ratio, perhaps, of cultivators to cultivating labourers in those parts of the country where the zamindari system prevailed in 1951. The figures

which we have already reviewed, contradict this error and confirm what would be expected by people who had a correct knowledge of the land-tenure system of India.

14. The question will nevertheless be asked: Can these figures be accepted as correct? Might they not be vitiated by error? Let us run over the possible sources of error.

Were the concepts understood by the enumerators and applied correctly? There is no doubt about the answer in all those states where village land record establishments (*patwaris*, *karnams* etc.) exist. To them, the distinction between Livelihood Classes I, II, III and IV was child's play, as indeed it would be to anyone born and brought up in villages. In other places the concepts needed explaining; but very special emphasis was laid on this topic and the necessary explanations were provided. The reports of Superintendents of Census Operations indicate that there was much less difficulty about these concepts than in drawing a line between earning dependents and self-supporting persons. With the possible exception of isolated areas where town dwellers had to be employed as enumerators in villages and did not receive sufficient instructions, it is most unlikely that any material error was introduced by failure of enumerators to understand what was wanted.

Could wrong answers have been given by the citizens themselves? There are three distinct contingencies in which this could have happened.

15. One has been described as 'category climbing'. Membership of Livelihood Class I involves a higher social status than membership of Livelihood Class II and *a fortiori* of Livelihood Class III. It was possible that some, who should be correctly described as II, described themselves as I, and some, who should be correctly described as III, described themselves as II or even I.

It is, however, exceedingly improbable that people would be tempted to make such mis-statements and succeed in making them before enumerators who had local knowledge *except* in the marginal cases—such as where a person cultivates both rented land and a piece of owned land and called himself I on the strength of the latter, though it was not his more important source of income. No reports suggest the possibility of category-climbing except in such marginal

cases. We have figures showing the numbers of such cases—because the principal means of livelihood, and the secondary means of livelihood (where one exists) have both been ascertained by separate questions. These figures have been scrutinised. They show that it is possible to define a margin of uncertainty by isolating all such cases. It has been verified that the margin is quite small. We may take it that 'category-climbing' exists; but the picture presented by the figures has not been materially affected, much less distorted, by it.

16. Another possibility of erroneous returns arises in the context of proposals for changes in the prevailing systems of land tenure. There are two different ways in which this possibility may express itself. It has been suggested *probably with justification, that there is a tendency* in some parts of the country for owners of land who do not cultivate it directly to claim that they do—because of the apprehension that some new legislation might be undertaken, as a result of which people who do not cultivate their land would be suddenly deprived of their rights without just compensation. It is difficult to be sure whether, and if so, where and to what extent this apprehension actually led to wrong returns. Fortunately, it is demonstrable by reference to the 1931 Census figures, that the low ratios now observed are *not* abnormal and are paralleled by similar ratios in 1931. At that time there was not only no such apprehension but membership of Livelihood Class IV involved even higher Social Status than Livelihood Class I and would, therefore, have been preferred by 'Category-climbers' in the marginal cases.

17. More important are the cases where the proper classification of a person is in genuine doubt or dispute. There are some localities where it can be both asserted and denied—in perfect good faith—that a person is a cultivating labourer and not a tenant-cultivator and *vice versa*. At the same time it is quite likely that there are, in some areas, considerable numbers of persons who are, without doubt, tenant-cultivators and who are, equally without doubt persons without just claim to occupancy rights in land. They may not be acknowledged as such and may be admitted to possession of land expressly on the footing of cultivating labourers, for the reason that the owners of land wish to safeguard themselves against the loss of their own occupancy rights. Again, it is possible, that there might be areas where the cultivators have long held land on a customary

tenure giving them the substance of occupancy rights—which are not, however, recognised by statute law or enforced by Courts. Such ambiguous or uncertain relations apply rarely to villages under the major systems of land tenure—whether raiyatwari, permanently settled zamindari or temporarily settled zamindari. They apply to the miscellaneous tenures—'Inams' jagirs and the like—which were excluded or reserved in vague terms when the major settlements were effected, and then evolved for several decades in different ways in different parts of the country. The general trend of legislation in the last few decades has been to resolve subsisting doubts in favour of the cultivator; and the present trend is to extend such legislation to cases where no doubts exist. In the light of this explanation of the sources of possible doubts and disputes, it is significant that the divisions which are thrown up as having an unusually small ratio of owner-cultivators to tenant-cultivators are those in which the exceptional types of tenures prevail e.g., West Madras (26:74), Rajasthan Dry Area (38:62), Bombay-Konkan (49:51), Himalayan West Bengal (58:42), East Rajasthan Plain (67:33).

In general, it may be concluded that the Census figures correctly reflect the reality of agricultural class structure in the country.

18. We may now revert to the basic ratio with which we started, viz., the proportion of agricultural classes to the general population, 69.9 per cent for India. It is necessary to re-emphasize the fact that this is the proportion which we get when we consider not only the persons who derive their principal means of livelihood by working as cultivators or cultivating labourers and not only the small number of people who subsist on agricultural rent, but also the members of their families who are dependent on them for their own subsistence—whether these be non-earning dependents or earning dependents.

Obviously, this is the sort of proportion to which we should pay attention when we seek to measure the extent to which people actually live on agricultural income. But if our objective is to compare cultivation of land with all other industries and services from the point of view of provision of gainful employment—this proportion may or may not serve the purpose. It should serve the purpose if the relative proportions of self-supporting persons, earning dependents and non-earning dependents are identical. But we know they are

not. We know they vary fairly widely between one place and another. Even this would not matter much, if the proportions were the same for the agricultural classes and the non-agricultural classes in the same part of the country. Even this is not the case.

19. We are in a difficulty in deciding what is a good index for the purpose in view, as the following figures for India will show:

TABLE 15

	Number (in lakhs)		Total	Ratio of Agricultural classes to total
	Agricultural classes	Non Agricultural classes		
All persons	2,491	1,075	3,566	69.9
SSPs	Persons 710 Males 585	334 287	1,044 872	68.1 67.1
SSPs + EDs	Persons 1,021 Males 690	402 316	1,423 1,006	71.7 68.6
SSPs + 3EDs	Persons 814 Males 620	356 297	1,170 917	69.5 67.6

EDs = Earning dependents.

SSPs = Self-supporting persons.

It is obvious that something can be said in favour of taking anyone of the six percentages which range from 67.1 to 71.7, indicating the extent to which agriculture provides gainful employment (and/or unearned income). It is necessary that this fact should be borne in mind and care taken to make sure precisely what it is that one is comparing. Otherwise the figures are apt to prove discrepant. Such care is especially necessary when comparisons are instituted between the 1951 and 1931 Censuses.

20. We have, so far, considered only the classification of people according to their principal means of livelihood. If this classification is to be correctly appreciated and misconceptions avoided, it is necessary to have some understanding not merely of the concept of 'secondary means of livelihood' but also of the numbers involved. 'Secondary means of livelihood' may mean anyone of two quite different things: First a Self-Supporting person may have, in addition to his principal means of livelihood, a secondary source of income also and this is referred to as 'his secondary means of livelihood'. Again, a person who is not self-supporting may yet have an income if he is an

earning dependent. In that case he—along with non-earning dependents—is affiliated to the person on whom he is dependent ; and the latter's principal means of livelihood determines his livelihood classification. But the source of income of the earning dependents (which may or may not be the same) is separately referred to as 'Secondary means of livelihood'.

Detailed tables have been published showing the numbers of persons with secondary means of livelihood, of either type, sub-divided according to the nature of such means of livelihood.

21. The results for India may be stated very briefly as follows:

I.—Out of 1,044 lakhs of self-supporting persons in India, 710 lakhs get their principal income from agriculture while the principal income of the other 334 lakhs is non-agricultural. Among them 894 lakhs of people have not returned any secondary means of livelihood. They include 599 lakhs of agriculturists and 295 lakhs of non-agriculturists. There remain 150 lakhs of self-supporting persons who have returned a secondary means of livelihood. They may be sub-divided as shown below:

- 42 lakhs of agriculturists whose secondary means of livelihood is also agriculture;
- 70 lakhs of agriculturists whose secondary means of livelihood, is non-agricultural;
- 25 lakhs of non-agriculturists whose secondary means of livelihood is agriculture; and
- 13 lakhs of non-agriculturists whose secondary means of livelihood is also non-agricultural.

II.—There are, in all, 379 lakhs of earning dependents of whom 311 lakhs are dependent members of the families of agriculturists and 68 lakhs are dependent members of the families of non-agriculturists. We have no information about the nature of the income secured by 10 lakhs, out of the 379 lakhs of

earning dependents. The others are divisible as follows :

TABLE 16

	<i>Earning agricultural income</i>	<i>Earning non-agricultural income</i>	<i>Total</i>
Dependent members of agricultural families . . .	250	52	302
Dependent members of non-agricultural families . . .	21	46	67
TOTAL . . .	271	98	369

22. Unless this background of interrelationship between different types of means of livelihood is borne in mind, one may be easily misled into wrong inferences from a study of census economic data. In particular, this background is necessary for appreciating the difference between the four 'agricultural classes' already mentioned and the different, though closely related, concepts of 'agricultural landholders' and landless 'agriculturists'. It would be wrong to identify Livelihood Class I with the former and livelihood Class III with the latter, though one might easily suppose this to be the natural thing to do.

If we mean by 'an agricultural landholder' every one who has got some permanent right in agricultural land without reference to whether the income therefrom is his principal or secondary means of livelihood or whether he does or does not work on the land, then obviously such persons might be found among any of the four agricultural livelihood classes and also among the non-agricultural classes. Likewise, if we mean by a 'landless agriculturist' every person who is not an agricultural landholder but who, nevertheless, subsists principally either by cultivating rented land or employment as a cultivating labourer, such persons would be found only in Livelihood Class II or III, but would not include all members of these two classes.

As 'landless agriculturist' and 'landholder' figure prominently in current discussions of land reform, a detailed analysis has been made of all *self-supporting persons* with reference to their secondary means of livelihood and a statement prepared for India, zones and the major states which

shows 'agricultural landholders' separately from 'landless agriculturists' and indicates how the numbers are arrived at. The statement is annexed to this part of the note (*Annexure I*). According to this statement, there are 402 landless agriculturists in India for every 1,000 agricultural landholders. The number varies very widely from 161 in Uttar Pradesh to 782 in Travancore-Cochin.

The figures for zones and major states are given below:

Zones : North India (161), West India (378), East India (444), Central India (445), and South India (625), [North-West India (with 500) cannot be satisfactorily placed because it includes Punjab (with 564) which is affected by a purely temporary aberration.]

Major States: Uttar Pradesh (161), Mysore (190), Assam (235), Orissa (271), Bombay (383), Madhya Bharat (397), Madhya Pradesh (413), Hyderabad (507), Bihar (510), Rajasthan (544), West Bengal (609), Madras (714) and Travancore-Cochin (782).

II.—COMPARISON BETWEEN 1951 AND 1931—INDIA.

23. The conceptual basis for comparison between the census economic data of 1951 and 1931 was already explained in Part A of this note.

With reference to that basis, the relevant data have been assembled in relation to the 1951 boundaries of states. The comparative statement thus prepared is annexed (*Annexure II*).

Use has already been made of the data contained in this statement in order to compare data relating to household economic status and the results were set out in Part B of this note.

We now proceed to compare the data so far as they bear on the agricultural class structure.

Let us consider first the proportion of the population which subsists on agriculture. At the outset there is the difficulty that the 1931 data furnished only 'earners' who earned any income from certain occupations which can be combined to make up agriculture, 'working dependents' who worked without pay and assisted their families to earn an agricultural income—but not 'non-working dependents' of agriculturists. And we also know that earners and working dependents of 1931 Census are not separately comparable with our self-supporting persons and earning dependents of 1951 Census though, in combination, they are. The best comparison that can be made, on available figures, for India as a whole is shown below:

TABLE 17

(NUMBER IN LAKHS)		(NUMBER IN LAKHS)	
1931 CENSUS		1951 CENSUS	
1. All earners	1,035	1. All self-supporting persons	1,044
2. All earners <i>plus</i> working dependents	1,224	2. All self-supporting persons <i>plus</i> earning dependents	1,423
3. Earners with agricultural occupations	685	3. Self-supporting persons in agricultural classes	711
4. All earners and working dependents with agricultural occupations	816	4. All self-supporting persons in agricultural classes ; and earning dependents with agricultural income	990
5. (i) Percentage of (3) on (1)	66	5. (i) Percentage of (3) on (1)	68
(ii) Percentage of (4) on (2)	67	(ii) Percentage of (4) on (2)	70

NOTE :— In this table the 1951 figures of 'earning dependents' show the number of dependent members of all families whose agricultural income which is some 30 lakhs less than all the dependent members of agricultural families who earn agricultural as well as non-agricultural income.

We may refer to the percentage worked out on item 5 of this table as the agricultural employment percentage (ignoring the fact that a small number of rentiers would be also included in the figures). The figures show that agricultural employment percentage had changed from 66-67 in 1931 to 68-70 in 1951. Notwithstanding an unavoidable element of uncertainty, this may probably be relied on as evidence that dependence on agriculture for employment did not decrease during these twenty years ; but probably increased though to a very small extent only.

24. Out of 1,035 lakhs of earners in 1931 the number of earners who were agricultural rentiers was 22.20 lakhs. Out of 1,224 lakhs of earners and working dependents, the number of agricultural rentiers was 24.52 lakhs. The percentage of agricultural rentiers based on these two factors was thus somewhere between 2.1 and 2.0. The comparison with 1951 works out as follows:

There were 1,044 lakhs of self-supporting persons in the whole of India as at present constituted, and the number of agricultural rentiers was 16.40 lakhs. The total number of self-supporting persons and earning dependents was 1,423 lakhs out of which those who subsisted on agricultural rent were 19.15 lakhs. The percentage of agricultural rentiers—based on the two factors,—was thus somewhere between 1.6 and 1.3.

These figures indicate that there has been a fall in the proportion of agricultural rentiers during the twenty years between 1931 and 1951. Is this fall significant? That is to say, could we be sure that it is not a mere accident of non-comparable classification at the two censuses. If it is significant—what is the significance? Does it mean that agricultural rentiers have become a definitely smaller percentage of the population? Or does it mean merely that people are now reluctant to acknowledge rentier status?

The answer to these questions must necessarily be a matter of opinion. It seems likely that the fall is significant. Even though the figure be very small, the trend is so consistently reflected at zonal, state and divisional level all over India that it cannot be regarded as an accident.

It would not be surprising if it is indeed a fact that the proportion of agricultural rentiers has become smaller than it used to be. In these

zamindari and other proprietary estates where rent is fixed in money—the income of small proprietors consists partly of such rent and partly of income from cultivation of owned land. The latter being in kind, is likely to have become more valuable relatively, because the price of produce has risen enormously. Again, the members of families of agricultural rentiers are likely to have better access to educational facilities than other agriculturists; and so there is a better chance of their turning over to non-agricultural avocations when numbers increase and real income decreases.

At the same time, it is also possible that there might have been some reluctance to acknowledge rentier status at this census and this may have contributed to the fall to some extent.

It is unnecessary to go further and try to assess the extent of the real fall more precisely because it is clear that the proportion of agricultural rentiers is, in any case, very small. It is necessary, however, to emphasize the fact that the proportion is small, as this has a bearing on our assessment of the validity of the 1951 figures of owner-cultivators. There can be no basis for any suggestion that these figures were inflated by rentiers who were anxious to disclaim rentier status. The smallness of the overall rentier proportion shows that the scope for any such inflation was negligible.

25. We may turn to a comparison between 1931 and 1951 ratio of cultivators to cultivating labourers. We cannot find the exact equivalent in 1931 of an overall ratio, inclusive of non-earning dependents, for there is no affiliation of such dependents to different occupational groups in 1931. There are also a number of other difficulties which will be mentioned presently.

The relevant figures of 1931 are the following, and they relate to the whole of India with the exception of Madhya Bharat and Bhopal:

TABLE 18

	NUMBER (IN LAKHS)
1. Earners in Occupational Groups 5, 6 and 8 .	425
2. Earners in Occupational Group 7	213
3. Working dependents in Occupational Groups 5, 6 and 8	73
4. Working dependents in Occupational Group 7	59

Occupational Groups 5, 6 and 8 consist of cultivators. Occupational Group 7 consists of cultivating labourers. 'Earners' include all self-supporting persons and also those earning dependents who earn any income in cash or kind but exclude all these earning dependents who are unpaid family helpers. In view of this definition the distinction between item 3 and item 4 is unreal. Item 4, like item 3, consists of unpaid family helpers. These cannot be members of families of cultivating labourers because no such member can be unpaid. Therefore items 1, 3 and 4 added together give the total number of members of families of cultivators who worked on cultivation in 1931, including family helpers. Item 2 comprised all members of cultivating labourers families who worked on cultivation. The ratio between cultivators and cultivating labourers in 1931 was therefore 557 : 213 or 72 : 28.*

26. We have seen already that the ratio of cultivators to cultivating labourers in 1951 for India as a whole was 82 : 18. But this ratio was based not only on self-supporting persons and earning dependents but also non-earning dependents. Therefore it is not the ratio which strictly corresponds to the 1931 ratio of 72 : 28 mentioned above. It might be better compared if we ascertained a ratio after excluding non-earning dependents from the figures of 1951. Here are the figures :

TABLE 19

(NUMBER IN LAKHS)

Livelihood Class	Self-sup- porting persons	Earning depen- dents	S S P plus E D
I	458	214	672
II	88	40	128
Total Cultivators	546	254	800
III Cultivating labourers	149	53	202

From these figures it follows that the ratio of cultivators to cultivating labourers is 80 : 20 (if based on self-supporting persons and earning dependents) and 79 : 21 (if based on self-supporting persons only).

*This calculation suffices to make the necessary correction for the inflation in the 1931 proportion of cultivating labourers to which attention was drawn in the 1931 Census Report (*vide* para 30 Part A).

It may be deduced that between 1931 and 1951 there has been a significant alteration of the ratio in favour of cultivators as against cultivating labourers and that is measured by the change from 72 : 28 in 1931 to 80 : 20 in 1951.

There is however a complication in that; these ratios are not, even now, entirely comparable. The reason is as follows. In 1931 we took into account those working dependents whose work was classifiable as Occupational Group 5, 6, 7 or 8 without reference to the classification of persons on whom they were dependent. In 1951 we took into account earning dependents of persons whose means of livelihood was classifiable as Livelihood Class I, II or III, without reference to the classification of the work of the earning dependents themselves. Let us see what correction is needed on this account and whether it makes much of a difference. Out of 254 lakhs of earning dependents of cultivators, 208 lakhs work on cultivation and 46 lakhs in other ways. Similarly, out of 53 lakhs of earning dependents of cultivating labourers, 40 lakhs work on cultivation and only 13 lakhs get their income in other ways. If we substitute the smaller for the larger figures in TABLE 17 we find that the ratio of cultivators to cultivating labourers in 1951 is 80 : 20 exactly the same as before. We may, therefore, conclude that between 1931 and 1951, the proportion of cultivating labourers has fallen and the proportion of cultivators has increased significantly in the country as a whole.

27. Given the position that there has been a significant change, what are the possible causes of such a change. Two main causes may be cited as possible which may be referred to briefly as 'transfer' and 'conversion'. When, over a period of 20 years, numbers increase (both among families of cultivators and among families of cultivating labourers), but the cultivated land does not increase in the same proportion—then either the number of workers on the same area of land must get needlessly increased (which is under-employment) or some workers must get 'transferred' from the land to non-agricultural avocations. Whether the one or the other takes place or both in part depends on other conditions—especially the increase of demand for workers in urban industries and services. If conditions are favourable for 'transfer' of some workers, it is reasonable to suppose that it would be the cultivating labourer who would move. The cultivator (who is in most

cases the owner) has the power of decision. If he thinks he no longer needs or can no longer afford to employ a cultivating labourer, the latter has to move. The other factor conversion may arise in two ways. First the people who were genuinely on the border line of cultivators and cultivating labourers may have become cultivators unmistakably. Secondly, cultivators who were not acknowledged as such but were treated as cultivating labourers by the owners of land and who, in the social climate of 1931, were returned, according to the status given to them by owners may have now got their status as cultivator acknowledged in the very different social climate of 1951. It may also be that they have acquired occupancy right by efflux of time under old legislation or by operation of new legislation designed to confer such rights.

A distinction should, however, be noted between the two possible causes. Decline of cultivation *per capita* is a change which has occurred in all parts of the country with negligible exceptions. Normally it should have given rise to some transfer of the cultivating labourer, if in any particular area, it has not led to any transfer, then the absence of such transfer—calls for explanation with reference to circumstances peculiar to the locality. On the other hand 'conversion' is, by its very nature, a local phenomenon. The circumstances in which it could occur on any significant scale are not present in all parts of the country as a general feature of agricultural class-structure.

28. Turning to the ratio of owner-cultivators to tenant-cultivators the figures indicate an enormous change. In 1931 there were 243 lakhs of tenant-cultivator-earners. In 1951 there were 458 lakhs of self-supporting owner-cultivators against only 88 lakhs of self-supporting tenant-cultivators. It is not worth pursuing the reasons for this change; for, as already explained, we know that a great deal of it was due to the fact that, misled by the name tenant, the distinction based on the presence or absence of permanent and heritable rights of occupancy in land was not given effect to in 1931. This is especially noticeable in North India (Uttar Pradesh) where in 1931 only 13 lakhs were classified as owner-cultivators against 98 lakhs of tenant-cultivators. The corresponding figures of 1951 are 114 lakhs and 10 lakhs respectively.

We may conclude our reference to this topic by saying that 1951 figures are not comparable with the 1931 figures in respect of the ratio of owner-cultivators to tenant-cultivators. A comparison between the two is not worth making since it is impossible to disentangle the difference due to real change which must no doubt have occurred during this period from the much greater difference caused by non-comparable classification.

III.—COMPARISON BETWEEN 1931 AND 1951—

NORTH INDIA

29. Non-earning dependency:

How the population grew in Uttar Pradesh between 1931 and 1951 and how the growth was reflected in villages and towns and in the three household economic status groups might be seen from the table below:—

TABLE 20

	(NUMBER IN LAKHS)		
	1931	1951	Increase + Decrease—
1. General population	498	632	+134
2. Rural population	442	546	+104
3. Urban population	56	86	+30
4. Earners/SSPs	207	193	—14
5. W Ds/EDs	34	76	+42
6. NWDs/NEDs	257	363	+106
7. Earners + W Ds/SSPs + EDs	241	269	+28

The disproportionate growth of non-earning dependents is clear. They had grown by 106 lakhs which is larger than the entire increase which took place in the rural population. The gainfully occupied persons on the other hand, had increased by only 28 lakhs, which is rather less than the entire increase which took place in the urban population.

30. Relative weight of dependence on agriculture:

The extent to which agricultural and non-agricultural avocations provided means of

WD-Working dependent; ED-Earning dependent; NWD-Non-Working dependent; NED-Non-earning dependent; SSP-Self-Supporting person.

livelihood is shown in the table below for 1931 and 1951 :

TABLE 21
(NUMBER IN LAKHS)

		1931	1951	Increase+ Decrease-
Earners/SSPs	{ Agricultural	146	139	-7
	{ Non-agricultural	61	54	-7
WDs/EDs	{ Agricultural	30	63	+33
	{ Non-agricultural	4	13	+9
Earners + WDs/ SSPs + EDs	{ Agricultural	176	202	+26
	{ Non-agricultural	65	67	+2

These figures indicate a rise in the agricultural employment percentage as follows: 1931—from 71 to 73 and 1951—72 to 75. These figures make it clear that during the twenty years 1931-50 there has been no reduction but on the contrary a small—but probably not insignificant—increase in the relative weight of dependence on agriculture as the means of livelihood of the people of Uttar Pradesh.

31. Cultivators and cultivating-labourers :

Changes in the numbers of cultivators and cultivating labourers are shown below:

TABLE 22
(NUMBER IN LAKHS)

		1931	1951	Increase+ Decrease-
Earners/SSPs	{ Cultivators	111	123	+12
	{ Cultivating labourers	31	13	-18
WDs/EDs	{ Cultivators	27	56	+29
	{ Cultivating labourers	3	7	+4
Earners + WDs/ SSPs + EDs	{ Cultivators and	172	199	+27
	{ Cultivating labourers			

While the total number of workers in cultivation has increased by 27 lakhs, there is an increase of cultivators by 41 lakhs and an absolute decrease of labourers by 14 lakhs. This requires explanation.

32. The first step is to adjust for non-comparable classification of working dependents classified as cultivating labourers in 1931, who must be members of cultivator families. The result of this adjustment is shown below:

TABLE 23
(NUMBER IN LAKHS)

		1931	1951	Increase+ Decrease-
Total number of workers in cultivation (including unpaid family helpers) :				
1. Cultivators	.	141	179	+38
2. Cultivating labourers	.	31	20	-11
Total	.	172	199	+27

Out of every 100 workers in cultivation (including unpaid family helpers) 82 belonged to families of cultivators while 18 belonged to families of cultivating labourers. These numbers changed to 90 and 10 in 1951. It is this change which needs explanation.

33. Cultivated acreages:

On an average of 5 years preceding 1931 the cultivated acreage in Uttar Pradesh was 348 lakhs of acres; 172 lakhs of people worked on this land. Thus every 100 cultivated acres gave employment to 49 workers in 1931. On an average of 5 years preceding 1951, the cultivated acreage had increased to 393 lakhs of acres with 199 lakhs of people working on them. One hundred cultivated acres thus gave employment to 51 workers in 1951. The increase in numbers working on the same unit of land was relatively small.

Given the position that the increase of cultivated acreage was such as to limit the provision of gainful employment to 199 lakhs of people, we have to see why the number got divided into 179 lakhs and 20 lakhs. We note that there were 141 lakhs of

workers of cultivating families in 1931. Assuming that they increased in number at the same rate as the general population, they would have grown to 179 lakhs in 1951 which is identical with the number in 1951 census. If we may suppose that the proportion of workers in the families of cultivators of Uttar Pradesh continued to be the same in 1951 as in 1931, it would follow that the whole of this number, 179 lakhs would have been first employed and the cultivators would have reduced the number of cultivating labourers employed by them to the balance number needed viz., 19 lakhs. This would account completely for the reduction which actually occurred among cultivating labourers.

34. The figures indicate that some other factor was also at work, tending to diminish the number of cultivating labourers. The Superintendent of Census Operations of Uttar Pradesh reports that "many persons who were formerly treated only as labourers, even though they were cultivating the *sir* or *khud-kasht* of zamindars, have now succeeded, as a result of legislation and administrative measures, in getting themselves recorded as cultivators of the land in their cultivating possession". He refers to a "remarkable fall in the figure of cultivating labourer in the Central Plain division" and says it is "due to the fact that owing to land reform legislation many of the former labourers have been converted into cultivators in the *taluqdari* districts of Oudh".

35. If the foregoing account of the changes which took place between 1931 and 1951 is to be accepted, it is necessary to form an idea about what happened to the natural increase among cultivating labourers. Between 1931 and 1951, the urban population of Uttar Pradesh increased by 30 lakhs of which it is clear that about one half or 15 lakhs must be due to migration from villages. It would seem that this migration must have been highly selective and operated as the outlet for the natural increase of cultivating labourer families.

The numbers involved are, however, such as to suggest that this cannot be the complete explanation. The 'conversion' mentioned in the foregoing paragraph must have been a significant factor and accounted for perhaps about 6 lakhs.

36. To sum up, it seems to be a fact that the relative proportion of cultivators to cultivating labourers changed in Uttar Pradesh from 82:18 in 1931 to 90:10 in 1951.

The reasons for this change may be stated as follows. There was a moderate amount of decline in the area of cultivated land *per capita*. This did not, however, lead to any very sizable increase in the number of people working on the same area of cultivated land. As, however, there were increased numbers of workers available in the families of cultivators, fewer labourers were needed and could be paid for. This was the main reason for the fall in the proportion of cultivating labourers. But it is not sufficient to explain the fall completely. Another important reason was the 'conversion' of former labourers into cultivators. This occurred mainly among people who worked on *sir* and *khud-kasht* lands of zamindars.

IV.—COMPARISON BETWEEN 1931 AND 1951—

EAST INDIA

37. Non-Earning Dependency (Zone):

The general population of East India increased from 700 lakhs in 1931 to 901 lakhs in 1951. At the same time the rural and urban population as well as the three household economic status groups increased as shown below:

TABLE 24

(NUMBER IN LAKHS)

	1931	1951	Increase+ Decrease—
1. General population	700	901	+201
2. Rural population	651	801	+150
3. Urban population	49	100	+51
4. Earners/SSPs	260	277	+17
5. W Ds/EDs	26	54	+28
6. NWDs/NEDs	414	570	+156
7. Earners+W Ds/SSPs+ EDs	286	331	+45

WD—Working dependent; ED—Earning dependent; NWD—Non-Working dependent; NED—Non-earning dependent; SSP—Self-Supporting person.

The figures show that non-earning dependents have increased disproportionately. The increase is 156 lakhs which exceeds the entire increase of the rural population. The number of gainfully occupied persons (including earning dependents) has increased by 45 lakhs which is somewhat less than the entire increase of urban population.

38. Non-earning dependency (States) :

How these changes occurred in each of the four major States of this zone may be seen from the table below:

TABLE 25
(NUMBER IN LAKHS)

	Growth of Rural population (1931-50)	Growth of NWDs/NEDs (1931-50)	Percentage of NWDs/NEDs	
			1931	1951
Bihar	64	69	59	64
Orissa	20	22	55	62
West Bengal	38	46	66	65
Assam	25	19	52	57

These figures show that Bihar, Orissa and Assam reproduce individually the same features as were already observed in India, North India and East India, *viz.*, a disproportionate increase in the percentage of non-earning dependents. West Bengal, it will be noticed, does not repeat this trend. Here too non-earning dependents have increased in number, but not excessively. On the contrary, there is a drop in the percentage from 66 in 1931 to 65 in 1951. What does this signify? It is difficult to be sure of the right answer. The following comments are made:

First,—It is to be observed that there has been a strikingly large growth of urban population within these twenty years. It has grown, in fact, from 28 lakhs to 62 lakhs. There is no other major State in India—not even Bombay—where the growth of urban population is proportionately as large. It is true that part of this growth must have been

due to inflow of migrants from outside the State. Nevertheless, it is probable that this growth provided more adequate opportunity than the other States for absorption in gainful employment of the natural increase occurring in villages; and

Secondly,—It is to be noticed that even after reduction, the percentage of non-earning dependency in West Bengal is still very high—(65). This makes it easier to accept the view that a genuine reversal of trend did probably occur during the last twenty years, as a result of the growth of Greater Calcutta.

39. Relative weight of dependence on agriculture (Zone):

The break-up of the number of self-supporting persons and earning dependents of East India by agricultural and non-agricultural classes is shown below:

TABLE 26
(NUMBER IN LAKHS)

		1931	1951	Increase+ Decrease—
		Earners/SSPs	{ Agricultural 183	199	+16
	{ Non-agricultural 77	78	+1	
WDs/EDs	{ Agricultural 13	31	+18	
	{ Non-agricultural 13	23	+10	
Earners+WDs/SSPs+E Ds	{ Agricultural 196	230	+34	
	{ Non-agricultural 90	101	+11	

The relative weight of dependence on agriculture in 1931 was 71, reckoned on earners only and 69 when reckoned on earners and working dependents jointly. The corresponding figures in 1951 were 72 and 70 respectively. The figures are inconclusive on the issue whether or not the weight of dependence on agriculture has increased.

40. *Relative weight of dependence on agriculture (States):*

To what extent are these features reproduced in the major States of this zone? This is shown in the table below:

TABLE 27

	1931	1951
Bihar	77	87 to 84
Orissa	68 to 64	77 to 70
West Bengal	60 to 57	47 to 48
Assam	61 to 60	62 to 64

The result is interesting. It is seen that the apparently inconclusive result for the zone as a whole, is the resultant of quite significant but contradictory movements in West Bengal and the other States of this zone.

The increases in Bihar, Orissa and Assam are of the same pattern as already observed for India as a whole and for Uttar Pradesh. West Bengal alone shows a sharp diminution. This is clearly connected with the phenomenon of reduction of non-earning dependency in that State.

41. *Cultivators and Cultivating Labourers (Zone):*

In East India the numbers of cultivators and cultivating labourers compare with one another in 1931 as well as 1951 as shown below:

TABLE 28

(NUMBER IN LAKHS)

	1931	1951	Increase+ Decrease-	
Earnings/SSPs	Cultivators	127	151	+24
	Cultivating labourers.	52	46	-6
WDs/EDs	Cultivators	5	18	+13
	Cultivating labourers.	8	13	+5
Earnings + WDs/ SSPs + EDs	Cultivators and Cultivating labourers.	192	228	+36

After adjusting for non-comparable classification of Working dependents and cultivating labourers in 1931, the combined results are shown below:

TABLE 29

(NUMBER IN LAKHS)

	1931	1951	Increase+ Decrease-
Total number of workers in cultivation (including unpaid family helpers) :			
1. Cultivators	140	169	+29
2. Cultivating labourers	52	59	+7
Total	192	228	+36

The ratio between cultivators and cultivating labourers had been 73 : 27 in 1931 and this had changed to 74 : 26 in 1951. There is a very small decline in the proportion of cultivating labourers and likewise a small increase in the proportion of cultivators.

42. *Cultivators and Cultivating Labourers (States):*

We may first note how this trend is reproduced in the major States of this zone.

TABLE 30

	Ratio of cultivators to cultivating labourers (including unpaid family helpers).	
	1931	1951
Bihar	73 : 27	72 : 28
Orissa	68 : 32	74 : 26
West Bengal	60 : 40	68 : 32
Assam	98 : 2	95 : 5

The figures indicate very striking differences in the different States. In Bihar there is practically no change in relative numbers. West Bengal appears to have had the highest proportion of

cultivating labourers in the zone but it has declined sharply during these 20 years and is now not much higher than in Bihar. The ratio in Orissa was intermediate between West Bengal and Bihar in 1931. The proportion of cultivating labourers has fallen.—It is now distinctly lower than in both Bihar and West Bengal.

Assam is entirely different from the other three States. The proportion of cultivating labourers remains negligible presumably because land has been available for all who were prepared to work on it.

43. Cultivated acreages:

All the four States possess statistics of cultivated acreages. But the returns are not based on field inspection by responsible staff. They cannot be accepted as the basis for serious analysis unless the inferences drawn from them are corroborated by other evidence. Among these figures those of West Bengal, which purport to evidence a growth of cultivated acreages from 74 lakhs to 109 lakhs, are definitely known to be incorrect because a change in the basis of estimation was effected in 1943 which had the effect of raising the pre-existing rice acreage by nearly 20 per cent. We may infer from the consistent trend of the figures of other States, that the rate of the growth of cultivation during these 20 years has fallen short of the rate of growth of population.

The figures for the other major States (given below), show much the same features as in Uttar Pradesh:

TABLE 31

	Number of workers per 100 cultivated acres	
	1931	1951
Bihar	50	52
Orissa	29	32
Assam	46	48

The increase in the number of workers per 100 cultivated acres was proportionately larger in Orissa than in Bihar or Assam. Assam as already noted, has so few cultivating labourers that the figures call for no comments. The reduction that has occurred in the proportion of cultivat-

ing labourers is intelligible for reasons discussed in respect of Uttar Pradesh. What is not clear in the light of all this, is why the Bihar proportion of cultivating labourers remains practically the same in 1951 as in 1931. Could it be because the decline of area of cultivated land *per capita* was less sharp in Bihar than in Uttar Pradesh? The figures indicate a drop of 6 cents—from 63 cents to 57 cents—in Bihar; while in Uttar Pradesh it fell by 10 cents—from 72 cents to 62 cents. In Orissa the decline was even sharper. This must be one of the reasons for the difference but might not be the only one. More research is needed before the matter can be cleared up.

V.—COMPARISON BETWEEN 1931 AND 1951—

SOUTH INDIA

44. *Non-earning dependency (Zone)*: The general population of South India increased from 577 lakhs in 1931 to 756 in 1951. How much of this increase took place in the rural population and in the urban population as well as the three household economic status groups is shown below:

TABLE 32

(NUMBER IN LAKHS)

	1931	1951	Increase + Decrease
1. General Population	577	756	+179
2. Rural Population	495	607	+112
3. Urban Population	82	149	+67
4. Earners/SSPs	215	201	-14
5. WDs/EDs	26	37	+11
6. NWDs/NEDs	336	518	+182
7. Earners + WDs/S S P s + EDs	241	238	-3

The figures present a surprise in that the entire increase of population seems to be balanced by an equal increase of non-earning dependents. The total number of persons who were gainfully occupied would appear to have been practically stationary during the twenty years.

45. *Non-Earning dependency (States)* : How do the major States of this zone fare in this respect ? This is shown below :

TABLE 33
(NUMBER IN LAKHS)

	Growth of general population (1931-50)	Growth of NWDs/NEDs (1931-50)	Percentage of NWDs/NEDs	
			1931	1951
Madras	124	133	58.3	69.0
Mysore	25	28	54.5	70.6
Travancore-Cochin	30	20	62.9	63.8

This increase of non-earning dependency was small in Travancore-Cochin but then it had already reached a high figure in that State in 1931. The other two States both show very large increases. These are not due to any disproportionate increase of women and children in the population. Thus, in Madras the people under age 15 dropped from 39 per cent in 1931 to 36 per cent in 1951, while among people aged 15 and over women were 51 per cent in 1931 and 50 per cent in 1951.

It is difficult to attribute these increases to errors in classification for Madras and Mysore are among the best equipped with village staff. It is also not very probable that the same kind of error should have independently appeared in both States. Further, it has been observed by the Superintendent of Census Operations, Madras that the variations of the household economic status pattern among the different divisions and districts of Madras present a consistent and intelligible picture. The theory of error is not, therefore, tenable. There are quite a number of indications which consistently point to South India as least provided with gainful occupation among all the zones in India. But this very large increase makes one wonder whether it may not (in part at any rate) reflect the effect of an unusually prolonged succession of unfavourable seasons which preceded 1951.

46. *Relative weight of dependence on agriculture (Zone)* : Separate figures for agricultural and

non-agricultural classes are furnished and compared in the table below :

TABLE 34
(NUMBER IN LAKHS)

		1931	1951	Increase+ Decrease-
		Earners/SSPs	{ Agricultural 128 Non-agricultural 87	126 75	-2 -12
WDs/EDs	{ Agricultural 16 Non-agricultural 10	20 17	+4 +7	
Earners + WDs/ SSPs + EDs	{ Agricultural 144 Non-agricultural 97	146 92	+2 -5	

The relative weight of dependence on agriculture was between 59 per cent and 60 per cent in 1931. In 1951 it was between 63 per cent and 61 per cent. There was thus a significant though small increase.

47. *Relative weight of dependence on agriculture (States)* : Similar figures for the major States of this zone are shown below :

TABLE 35

	1931	1951
Madras	59 to 60	64 to 63
Mysore	69 to 71	68 to 65
Travancore-Cochin	48 to 45	51 to 49

The figures show that dependence on agriculture has definitely increased by nearly 4 per cent in Madras. It has definitely decreased in Mysore, though there is room for much uncertainty about the true extent of this decrease. In Travancore-Cochin it has almost certainly increased, though, here again, the extent of the increase is uncertain.

48. *Cultivators and Cultivating labourers (Zone):*

The number of cultivators and cultivating labourers are compared below :

TABLE 36
(NUMBER IN LAKHS)

		1931	1951	Increase + Decrease—
Earners/SSPs	Cultivators	75	81	+6
	Cultivating labourers	47	40	-7
WDs/EDs	Cultivators	6	5	-1
	Cultivating labourers	9	14	+5
Earners + WDs/ SSPs + EDs	Cultivators and Cultivating labourers	137	140	+3

After reclassifying the working dependents of cultivating labourers of 1931, we get the following results.

TABLE 37
(NUMBER IN LAKHS)

	1931	1951	Increase + Decrease—
Total number of workers in cultivation (including unpaid family helpers):			
Cultivators	90	86	-4
Cultivating labourers	47	54	+7
Total	137	140	+3

The figures show that there has been a definite change. *The ratio of cultivators to cultivating labourers was 66:34 in 1931 and 61:39 in 1951.* Thus the zone as a whole reproduces the Bihar pattern in this respect and differs from the pattern of Uttar Pradesh.

49. *Cultivators and Cultivating labourers (States):*

The ratio for each of the three states has been worked out separately and they are shown below :

TABLE 38

	Ratio of cultivators to cultivating labourers (including unpaid family helpers)	
	1931	1951
Madras	62 : 38	60 : 40
Mysore	87 : 13	84 : 16
Travancore-Cochin	66 : 34	50 : 50

These figures show a *small* increase in the proportion of Cultivating Labourers in Madras, as well as in Mysore, and a fairly substantial increase in Travancore-Cochin. Why it should have occurred is a puzzling question which needs further research for answer.

50. *Cultivated acreages :* The figures of cultivated acreages are available for all three States and those of Madras and Mysore are among the most reliable in India. They are shown below :

TABLE 39

	Cultivated acreages—average of 5 years (IN LAKHS)		Number of workers per 100 cultivated acres	
	1931	1951	1931	1951
Madras	320	310	34	36
Mysore	65	63	32	26
Travancore-Cochin	26	28	14	27

In Madras and Mysore, the cultivated acreage had been stationary for a long time, and registered a small decrease because of an unusually prolonged succession of unfavourable seasons before the 1951 Census. In Travancore-Cochin, the 1931 level of cultivated acreage was

increased by 11 per cent while the 1931 population increased by 47 per cent. In the result the area of cultivated land *per capita* declined heavily in all three States *viz.*, from 72 to 54 cents in Madras, 99 to 70 cents in Mysore, and from 40 to 30 cents in Travancore-Cochin.

The reaction to this decline has been materially different in the three States. In Madras, the main result has been a large increase of the percentage of non-earning dependency of the general population, a small increase in the number of workers for 100 acres of cultivated land *plus* a small increase of cultivating labourers relatively to cultivators.

In Mysore, the main result has been an even larger increase than in Madras of the percentage of non-earning dependency of the general population. At the same time, however, the number of workers per 100 acres of cultivated land has diminished.

In Travancore-Cochin, non-earning dependency of the general population had already reached a high level in 1931 and though a further increase took place during 1931-50, it was quite small. The main reaction to decline of the area of cultivated land per capita has been a quite substantial rise in the number of workers per 100 acres of cultivated land, and this increased number consists of a large number of cultivating labourers relatively to cultivators than in 1931. There seems to be little reason for doubting

that the differences observable between South India and other zones so far considered must be related to the fact that the decline of the area of cultivated land per capita has been much sharper in South India than in North India or East India. There are differences in the reactions of different parts of South India. Each is intelligible in its way—but why one part should react in one way and another part in another way, is an interesting question which cannot be answered without much closer study and local investigation.

One type of explanation which lies on the surface may be mentioned. The figures of TABLE 35 make it clear that Mysore is distinguished from other parts of India by the fact that non-agricultural employment has developed to a greater extent during the last 20 years. This must have had its effect in attracting labour away from the land and thus causing the fall in the number of workers per 100 cultivated acres.

VI.—COMPARISON BETWEEN 1931 AND 1951—

WEST INDIA

51 *Non-earning dependency:*

The general population of West India increased from 287 lakhs in 1931 to 407 lakhs in 1951. The break up of this increase by growth of rural and urban population as well as by the different household economic status groups is shown for 1931 and 1951 separately in the table below :

TABLE 40

(NUMBER IN LAKHS)

	1931	1951	Increase + Decrease—
1. General Population	287	407	+ 120
2. Rural Population	224	280	+ 56
3. Urban Population	63	127	+ 64
4. Earners/SSPs	94	109	+ 15
5. WDs/EDs	22	64	+ 42
6. NWDs/NEDs	171	234	+ 63
7. Earners + WDs/SSPs + EDs	116	173	+ 57

West India, according to these figures, presents a very different picture from the other Zones. In the first place the increase in the urban population (which has doubled itself) had been even larger than the increase of rural population notwithstanding that the percentage increase of rural population is as high as 25.0 per cent (as against India's 21.9 per cent). Plainly, the urban growth has been brought about by an influx of migrants from outside the Zone—an inference which is corroborated by other considerations as well).

Then we note that the growth in the number of non-earning dependents is little more than one-half of the total increase of population. The percentage of non-earning dependents, has therefore, decreased from 59.6 per cent to 57.5 per cent.

The figures for Bombay reproduce the foregoing features of West India (which includes, in addition, Saurashtra and Kutch). The urban population of Bombay has increased by 58 lakhs, while the rural population increased by 50 lakhs. Non-earning dependents have increased by 57 lakhs. The percentage of Non-earning dependents to the general population has decreased from 59.2 per cent in 1931 to 57.2 per cent in 1951.

In this context, it should be added that there was practically no change in the age-sex-structure of Bombay. People below age 15 numbered about 40 per cent both in 1931 and 1951. Among those aged 15 and over, women were 48 per cent both in 1931 and 1951.

52. Relative weight of dependence on agriculture :

The break up of the numbers of self-supporting persons and earning dependents into corresponding segments of agricultural and non-agricultural

classes is shown below and compared between 1931 and 1951 :

TABLE 41
(NUMBER IN LAKHS)

		1931	1951	Increase+ Decrease-
Earners/SSPs	{ Agricultural	58	59	+ 1
	{ Non-agricultural	36	50	+ 14
WDs/EDs	{ Agricultural	16	51	+ 35
	{ Non-agricultural	6	13	+ 7
Earners + WDs SSPs + EDs	{ Agricultural	74	110	+ 36
	{ Non-agricultural	42	63	+ 21

The agricultural employment percentage may be estimated as lying between 61.7 per cent and 63.8 per cent in 1931; while the corresponding figures for 1951 are 54.1 per cent and 63.6 per cent.

The relevant figures limited to Bombay State alone are as follows: The value for 1931 lies between 63.2 and 65.3; while the value for 1951 lies between 55.5 and 64.6. The figures suggest that in Bombay State, and in West India as a whole there probably was some reduction in the dependence on agriculture; but it is not possible to be certain on the point, because the numbers of unpaid family helpers are large and the nature and extent of their contribution are necessarily uncertain.

53. Cultivators and cultivating labourers :

The relevant comparison is exhibited side by side for West India as a whole and Bombay state separately :

TABLE 42

(NUMBER IN LAKHS)

	West India			Bombay			
	1931	1951	Increase+ Decrease-	1931	1951	Increase+ Decrease-	
Earners/SSPs	{ Cultivators	27	47	+20	24	42	+18
	{ Cultivating Labourers	29	11	-18	28	10	-18
WDs/EDs	{ Cultivators	4	31	+27	3	28	+25
	{ Cultivating Labourers	12	19	+7	10	17	+7
Earners + WDs/ SSPs + EDs	{ Cultivators and Cultivating Labourers	72	108	+36	65	97	+32

We should, as explained before, reclassify the working dependents of Cultivating labourers of

1931 and recombine the figures. They yield the following results :

TABLE 43

(NUMBER IN LAKHS)

	West India			Bombay		
	1931	1951	Increase + Decrease—	1931	1951	Increase + Decrease—
Total number of workers in cultivation (including unpaid family helpers):						
Cultivators	43	78	+35	37	70	+33
Cultivating labourers	29	30	+1	28	27	—1
Total	72	108	+36	65	97	+32

The figures make it clear that (even after allowance is made for non-comparable classification) there has been relatively a reduction in the number of cultivating labourers in West India as well as in Bombay alone. The ratio between cultivators and cultivating labourers has fallen in Bombay from 57:43 in 1931 to 72:28 in 1951.

54. Cultivated acreages :

Bombay has excellent statistics of cultivation. Unfortunately these were somewhat marred shortly before 1951 by the inclusion in almost every district of a large number former princely States which had no statistics at all or only very poor statistics. It is possible, however, to make allowance for this fact and conclude without any doubt that cultivation did *not* keep pace with increase of population. Whereas the area of cultivated land per capita was 1.56 acres in 1931, it had declined to 1.18 acres in 1951.

Let us consider 1,000 persons of the general population in Bombay in 1931. They included $\frac{1000 \times 65}{252}$ or 258 persons working in cultivation—whether as cultivators, cultivating labourers, earners or working dependents; and they had $1,000 \times 1.56 = 1560$ acres to cultivate. Thus 100 acres of cultivation gave employment in 1931 to 17 persons. By 1951, the 1,000 persons of 1931 had increased to 1,425 persons. They included $\frac{1,425 \times 97}{360}$ or 384

persons working in cultivation. They cultivated $1,425 \times 1.18$ or 1,682 acres. Thus, in 1951 100 acres of cultivated land gave employment to 23 persons.

It is fairly certain that the 23 persons of 1951 who worked the same 100 acres as 17 persons in 1931 were less fully employed. From this it would seem to be natural that the cultivators of 1951 must have used unpaid family helpers to a much larger extent than their fathers in 1931, and that the opportunities for employment available to the increased number of cultivating labourers diminished correspondingly.

While this explanation seems to be natural and credible, it raises two questions. First, is it the only explanation for the drop in the number of cultivating labourers? Secondly, why did not such a drop occur in Bihar? These are difficult questions to which conclusive answers cannot be furnished without further study supplemented by local enquiries. The answers which may be advanced as working hypotheses on the basis of the present review are as follows :

First,—The drop in the number of cultivating labourers cannot be wholly explained by the fact that the natural increase of cultivators and the members of their families outran the increase in the area of cultivated land. It seems almost certain that a 'conversion' phenomenon was at work. Though Bombay is mainly raiyattwari there are parts of the State where minor

tenures exist which involve ambiguous relations between the landholder and cultivator. There has been tenancy legislation designed to confer security of tenure on the latter. It is, therefore, not merely possible but probable that some of the 'labourers' of 1931 were even then *de facto* cultivators, but described as labourers in order to discourage claims for occupancy right. Further 'conversions' might have taken place as a result of the general social trend and tenancy legislation. Ambiguous relations of this type are not necessarily confined to landholders and cultivators. They might also have prevailed in 1931, as between creditors and indebted cultivators. If such a state of affairs had existed, it would have been greatly changed during the decade of high prices which preceded 1951.

Secondly,—The differences between Bombay and Uttar Pradesh on the one hand and Bihar on the other, are probably attributable to one, or other or both of two factors. The extent to which non-agricultural employment was increasing and attracting workers from families of cultivating labourers away from the land must have made a considerable difference. Where this attraction existed, wages would have risen to a point at which—even at the high level of prices—the cultivators with diminished holdings would have found it difficult to employ labour on the same scale as before. It is quite likely that this outlet for landless labour was more effective in Bombay than in Uttar Pradesh and much more effective in these two States than in Bihar.

Thirdly,—while such economic considerations are important, social factors must also have played their part. The extent to which social habits and customs permit women of cultivator families to work in the fields probably varies very considerably and might have undergone changes during the last 20 years. This is an elusive aspect of the problem which has to be constantly borne in mind.

Fourthly,—the possibility has been suggested that 'category climbing' in Bombay might have diminished the numbers of cultivating labourers in 1951. The scope for such category-climbing was, indeed, somewhat larger in Bombay than in the country as a whole. Out of 34 lakhs of self supporting owner-cultivators in Bombay, 3 lakhs returned employment as cultivating

labourer or cultivating rented land as secondary means of livelihood. The corresponding figures for the country as a whole were 458 lakhs and 32 lakhs respectively. Even so, the numbers involved in 'category-climbing' in 1951 are too small to account for any very large part of the observed decrease. The position would be different if we might suppose that 'category climbing' could have attained the point of actual suppression of the status of labourer even as secondary occupation, but there is no good reason in support of such a supposition.

VII. COMPARISON BETWEEN 1931 AND 1951—

CENTRAL INDIA

55. *Non-Earning dependency (Zone)* : The general population of Central India increased from 422 lakhs in 1931 to 523 in 1951. How this increase compared with the increase, separately, of the rural and urban population and of the three household economic status groups is shown below :

TABLE 44

	(NUMBER IN LAKHS)		
	1931	1951	Increase+ Decrease-
1. General Population	422	523	+101
2. Rural Population	377	440	+63
3. Urban Population	45	83	+38
4. Earners/SSPs.	169	152	-17
5. WDs/EDs.	47	104	+57
6. NWDs/NEDs.	206	267	+61
7. Earners + WDs/SSPs + EDs.	216	256	+40

The pattern of growth is much the same as in India as a whole and in North India. Non-earning dependents have increased from 49 per cent in 1931 to 51 per cent in 1951.

56. *Non-Earning dependency (States)* †

How the different major states of this zone fared are shown below :

TABLE 45

(NUMBER IN LAKHS)

	Growth of rural Population (1931-50)	Growth of NWDs/NEDs (1931-50)	Percentage of NWDs/NEDs 1931 1951	
Madhya Pradesh	23	11	47	44
Madhya Bharat	10	15	50.1	58.7
Hyderabad	24	25	52.8	54.3

The figures draw attention to the exceptionally low level of non-earning dependency in Madhya Pradesh. The 1951 figure is so low in comparison with other states that, if it stood alone, one is almost certain to surmise that some sort of error had been committed whereby people who should have been classed as non-earning dependents, were classed as 'earning dependents' which is the exact opposite of the surmise about Madras and Mysore. Such a surmise is discouraged immediately, not only by the fact that Madhya Pradesh is also one among the states which are well equipped with *Patwari* Staff and subordinate rural administrative staff but by an even more important fact, *viz.*, that the 1931 figures reflect the same phenomenon in an unmistakable manner. It does seem, therefore, likely that the participation of women in gainful work generally and particularly in the cultivation of family holdings in Madhya Pradesh is perhaps the highest in India. Why this should be so, is a matter for study of differences in social habits and customs. But the fact itself seems to be clearly established by all available data.

The figures of Hyderabad are normal, both in respect of the extent of increase which took place during 1931-50 as well as its absolute size. But Madhya Bharat is somewhat puzzling, because

non-earning dependency has risen very sharply—the rise is comparable to that already observed in Madras.

57. *Relative weight of dependence on agriculture (Zone)* :

The relevant figures are furnished below :

TABLE 46

(NUMBER IN LAKHS)

		1931	1951	Increase + Decrease—
Earners/S.S.Ps	Agricultural	113	110	—3
	Non-agricultural	56	42	—14
W.Ds/E.Ds.	Agricultural	33	85	+52
	Non-agricultural	14	19	+5
Earners + W.Ds/ S.S.Ps + E.Ds.	Agricultural	146	195	+49
	Non-agricultural	70	61	—9

Agricultural Employment Percentage was 67 in 1931 and had risen from 72 to 76 in 1951.

58. *Relative weight of dependence on agriculture (State)* :

The following table shows the changes in the two major states of this zone for which figures are available for 1931 as well as 1951.

TABLE 47

	1931	1951
Madhya Pradesh	76 to 78	75 to 79
Hyderabad	50 to 49	65 to 71

From these figures it would appear that, so far as Madhya Pradesh is concerned it is doubtful whether there has been an increase of dependence. If there was, it was almost certainly very small. There is a large increase of agricultural employment percentage in Hyderabad. It may be that the increase of Hyderabad is real, following the pattern of Madras and Mysore. The possibility cannot be ruled out that there might have been some error in the low 1931 figures for Hyderabad.

59. *Cultivators and Cultivating labourers (Zone):*

The number of cultivators and cultivating labourers are compared in the table below for 1931 and 1951.

TABLE 48

(NUMBER IN LAKHS)

		Increase+		
		1931	1951	Decrease-
Earnings/S.S.Ps.	Cultivators	56	74	+ 18
	Cultivating Labourers	52	33	- 19
WDs/EDs.	Cultivators	20	19	- 1
	Cultivating Labourers	11	66	+ 55
Earnings + WDs/ S.S.Ps. + EDs.	Cultivators and Cultivating Labourers.	139	192	+ 53

After reclassifying the working dependents as cultivating labourers in 1931, we have the following results :

TABLE 49

(NUMBER IN LAKHS)

		Increase+		
		1931	1951	Decrease-
Total number of workers in cultivation (including unpaid family helpers) :				
Cultivators		87	93	+ 6
Cultivating Labourers		52	99	+ 47
Total		139	192	+ 53

The ratio was 63:37 in 1931. It changed by 1951 to 48:52.

60. *Cultivators and Cultivating labourers (States):*

The ratios for the two major states for which figures are available are shown below :

TABLE 50

		Ratio of cultivators to cultivating labourers (including unpaid family helpers)	
		1931	1951
Madhya Pradesh		57:43	42:58
Hyderabad		67:33	44:56

It is observed that the relative numbers of cultivating labourers increased in Madhya Pradesh as well as in Hyderabad.

61. Cultivated acreages :

It is reliably known that in Madhya Pradesh cultivated acreage was practically stationary between 1931 and 1951. Let us consider 1,000 persons in 1931. They included 416 workers in cultivation (this includes cultivators and cultivating labourers and earners as well as working dependents). They cultivated 1,610 acres of land. In 1951, the 1,000 persons had increased to 1,196. They included 524 workers in cultivation who cultivated the same 1,610 acres. The result is that the number of workers per 100 acres of cultivated land increased from 26 in 1931 to 33 in 1951.

In the aggregate, therefore, the same land is giving employment to the original number of workers as well as the natural increase in these numbers, and in fact some more. In these circumstances why should the proportion of cultivators increase and the proportion of cultivating labourers diminish. It seems likely that the two causes noticed in Uttar Pradesh must have been both operative, but their relative importance must have been reversed. To some extent the natural increase in the families of smaller cultivators must have thrown cultivating labourers out of employment. To an even larger extent, however, the process of 'conversion' of cultivating labourers into cultivators of 'unowned land' (if not of owned land) must have gone on throughout the twenty year period. The *malguzari* tenure of this state had kept in being a relatively larger proportion of proprietors of states who carried on direct cultivation than under the main zamindari states (whether permanently settled as in East India and parts of South India or temporarily settled as in North India). It seems probable that there was even greater scope for the 'conversion' process in Madhya Pradesh than in Uttar Pradesh. There was possibly also greater need, since urbanisation was not providing an outlet for landless labour to anything like the same extent as in Uttar Pradesh.

VIII.—COMPARISON BETWEEN 1931 AND 1951—

(NORTH-WEST INDIA)

62. *Non-earning dependency (Zones & States)* : The general population of North-West India increased from 270 lakhs in 1931 to 350 lakhs in 1951. The growth in villages and towns as

well as in the three different household economic status groups may be seen from the table* below:

TABLE 51

	(NUMBER IN LAKHS)		
	1931	1951	Increase + Decrease—
1. General Population.	270	350	+80
2. Rural Population.	230	275	+45
3. Urban Population.	40	75	+35
4. Earners/SSPs	91	113	+22
5. WDs/EDs	34	44	+10
6. NWDs/NEDs	145	193	+48
7. Earners + WDs/SSPs + EDs	125	157	+32

The picture is broadly the same as that of many other parts of India. The increase in the non-earning dependents is a little more than that of the rural population and the increase in self-supporting persons and earning dependents taken together is a little less than of the urban population

The percentage of non-earning dependents to the general population has increased from 54 per cent. to 55 per cent. The increase is small. Separate figures for the two major states of this zone are shown below :

TABLE 52

	Percentage of non-earning dependents	
	1931	1951
Rajasthan	47.4	49.6
Punjab	61.0	61.4

There is practically no change in the Punjab. But there is a relatively small increase in Rajasthan. It is to be observed that there is a striking difference between these two states in respect of

*Records of a little over 3 lakhs burnt by fire. They are distributed as 1 lakh S S Ps. and 2 lakhs N E Ds.

the percentages of non-earning dependency. If this difference had been noted and commented on for only one census it would have given rise to a surmise that one of the figures was probably, erroneous. But the persistence of the difference with figures of the same order at both censuses discourages any such surmise. This is one indication among many that it would be wise to accept the census economic data as correct until the contrary is clearly established. Apparently inexplicable differences disclosed by the figures should not be lightly dismissed or attributed to accident or error. More often than not, they are likely to be found to reflect genuine differences of economic structure, themselves firmly rooted in genuine differences of social conditions.

63. *Relative weight of dependence on agriculture (Zone and States):*

The relevant figures are given below :

TABLE 53

(NUMBER IN LAKHS)

		Increase +		
		1931	1951	Decrease—
Earners/S.S.Ps	Agricultural	53	77	+24
	Non-Agricultural	38	36	—2
WDs/EDs	Agricultural	30	30	..
	Non-Agricultural	4	14	+10
Earners + WDs/ SSPs + EDs	Agricultural	83	107	+24
	Non-Agricultural	42	50	+8

Agricultural employment percentage ranged in 1931 between 58 (based on earners only) and 66 (the figure based on earners and working dependents). There was then a wide margin of uncertainty. In 1951, the corresponding figures were 68 on both counts. From this it may be fairly inferred that there has been some increase in dependence on agriculture and that there was certainly no decrease. Whether the increase was small or large is a matter of considerable doubt

because of the role of unpaid family helpers in cultivation, which is difficult to evaluate.

Separate figures for the two major states of this zone are furnished below.

TABLE 54

	1931	1951
Rajasthan	59 to 68	75 to 74
Punjab	57 to 63	66 to 65

In each of these two states dependence on agriculture has clearly increased.

64. *Cultivators and Cultivating labourers (Zone and States):*

The relevant numbers for the zone are given below :

TABLE 55

(NUMBER IN LAKHS)

		Increase +		
		1931	1951	Decrease—
Earners/SSPs.	Cultivators	42	69	+27
	Cultivating labourers	8	6	—2
WDs/EDs	Cultivators	13	22	+9
	Cultivating labourers	17	7	—10
Earners + WDs/ SSPs + EDs	Cultivators	80	104	+24
	Cultivating labourers			

After reclassifying the 1931 working dependents shown as cultivating labourers and combining unpaid family helpers, the results are shown below :

TABLE 56

(NUMBER IN LAKHS)

	Increase +		
	1931	1951	Decrease—
Total number of workers in cultivation (including unpaid family helpers).			
Cultivators	72	91	+19
Cultivating Labourers	8	13	+5
Total	80	104	+24

These figures show that the ratio of cultivators to cultivating labourers had been 90 : 10 in 1931 and had become 87:13 in 1951.

The corresponding figures for the two major states are shown below :

TABLE 57.

	Ratio of Cultivators to Cultivating labourers (including un-paid family helpers)	
	1931	1951
Rajasthan	89:11	90:10
Punjab	89:11	82:18

A small decline in the proportion of cultivating labourers has occurred in Rajasthan, the change in Punjab is in the opposite direction.

65. Cultivated acreages and explanation of change in the ratios:

Figures are available only for the Punjab. They show an increase of the cultivated acreages from 114 lakhs of acres in 1931 to 120 lakhs of acres in 1951, cultivation *per capita* declining from 106 cents in 1931 to 95 cents in 1951. The total number of workers per 100 cultivated acres has increased from 23 to 26.

It thus appears that the decline in the area of cultivated land *per capita*, is quite large in the Punjab. It is the result of an increase in the number of workers on the land. Conversion of labourers into cultivators of the type mentioned in North and West India is probably the main reason for the small change in Rajasthan.

IX.— COMPARISON BETWEEN 1931 AND 1951—

(SUMMARY OF MAIN CONCLUSIONS)

I.— Between 1931 and 1951, population grew faster than cultivation. The area of cultivated land *per capita* is known to have declined significantly in Uttar Pradesh, Bihar, Orissa, Assam, Madras, Mysore,

Travancore-Cochin, Bombay, Madhya Pradesh and Punjab. There is little doubt that if correct figures of cultivation had been available for other states a similar decline would have been observed in all of them.

II.— Notwithstanding such decline in the area of cultivated land *per capita*, the relative weight of dependence on agriculture for gainful employment has not declined in the country as a whole. It is probable that it has increased slightly. Such increase is observable in Uttar Pradesh, Bihar, Orissa, Assam, Madras, Hyderabad, Rajasthan and Punjab. Dependence on agriculture has probably not changed in Madhya Pradesh. It has probably diminished in Bombay, West Bengal and Mysore.

III.— The main reaction to this general decline in the area of cultivated land *per capita* unaccompanied by a more than proportionate increase in non-agricultural employment, has been a general increase of non-earning dependency. The increase in absolute number of non-earning dependents has exceeded the entire increase of rural population in India as well as in five out of six zones.

The percentage of non-earning dependents to the general population has increased in every major state except Bombay, West Bengal and Punjab. It has decreased slightly in Bombay and West Bengal and is practically unchanged in the Punjab.

The increases in the percentages are not accompanied by any material change in the sex ratio or age-structure. They must, therefore, be regarded as a rough index of the growth of unemployment in different parts of the country.

IV.— There has been a general increase throughout the country in the number of cultivators and cultivating labourers (including unpaid family helpers) working on the same area of cultivated land—say 100 acres. The increases are relatively small in the following states : Assam (46 to 48), Bihar (50 to 52), Uttar Pradesh (49 to 51), Madras (34 to 36) and Orissa (29 to 32).

Larger increases are observed in the following States: Punjab (23 to 26), Bombay (17 to 23), Madhya Pradesh (26 to 33) and Travancore-Cochin (41 to 57).

Among the major states for which figures are available, Mysore alone shows a fall in this number (32 to 26).

The figures of increase in the number of workers provide a rough indication that under-employment is growing on the land, but the picture is somewhat blurred by uncertainty about the role of unpaid family helpers in the cultivation of land.

V.—Material changes have occurred in the percentage of cultivating labourers to all workers in land (that is to say, cultivating labourers and cultivators including their unpaid family helpers).

The percentage has increased in Travancore-Cochin (34 to 50), Hyderabad (33 to 56), Madhya Pradesh (43 to 58), Punjab (11 to 18) and Mysore (13 to 16).

The percentage has remained practically unchanged in Bihar (27 to 28), Madras (38 to 40) and Rajasthan (11 to 10).

In other states, the percentage has fallen: Uttar Pradesh (18 to 10), Orissa (32 to 26), West Bengal (40 to 32), and Bombay (43 to 28).

The fall in the percentage of cultivating labourers is the natural result of increase in the number of cultivators and members of their families occupying the same area of cultivated land. The cultivators' need for employing labourers diminishes, as also their capacity to pay for their services.

It is clear, however, that this is not the sole cause of the fall in the proportion of cultivating labourers. There are reasons to believe that in various parts of the country, there were considerable number of people who were in fact cultivators but not acknowledged as such in order to guard against the accrual of occupancy rights in land. There were probably also other people who partook of the characteristics of both cultivators and cultivating labourers and whose classification was open to genuine doubt. As a result of the operation of tenancy legislation (old and new) as well as the

general change in the social climate, it is likely that a 'conversion' has taken place between 1931 and 1951, of many such people from the status of cultivating labourers to cultivators. Such 'conversion' probably accounts for an important part of the fall in the proportion of cultivating labourers observed in Bombay, Uttar Pradesh, and possibly also elsewhere. While there is little doubt about the fact that the proportion of cultivating labourers has fallen and the fall is explainable by the two reasons mentioned above, there are puzzling variations in the nature of the changes which have taken place in different states.

VI.—There is a complex inter-relationship between the nature and magnitude of changes of the following description (all of which occurred between 1931 and 1951) the intensity of the decline of the area of cultivated land *per capita* the rate of urbanization and the rate of growth of non-agricultural avocations; the actual extent to which un-employment has increased and been reflected in the percentage of non-earning dependency; the actual extent to which under-employment has increased and been reflected in the number of workers on unit area of cultivated land; and finally the nature and extent of changes, if any, in the participation of unpaid family helpers in cultivation operations. Much more detailed study and many local enquiries are necessary before this inter-relationship can be unravelled completely.

VII.—Among cultivators the relative proportion of those who may be called owner-cultivators because they possess permanent and heritable occupancy rights in land must have increased to some extent between 1931 and 1951. It is not, however, possible to institute a comparison in this respect because of non-comparable classification at the two censuses.

VIII.—Agricultural rentiers formed only a small proportion of the people in 1931 and this proportion has become still smaller in 1951.

ANNEXURE I

Agricultural Landholders and Landless Agriculturist—1951

ABSTRACT

India/Zones/Major States	Number per 1,000 Self-supporting persons of general population who are:				agricultural landholders	Landless agriculturists	Number of landless agriculturists per 1,000 agricultural landholders
	Landholders Type A	Landholders Type B	Landholders Type C				
1	2	3	4	5	6	7	
INDIA	406	32	69	507	204	402	
North India	543	23	87	653	105	161	
East India	421	41	70	532	236	444	
South India	331	19	55	405	253	625	
West India	369	51	27	447	169	378	
Central India	382	51	86	519	231	445	
North-West India	386	13	49	448	224	500	
Uttar Pradesh	543	23	87	653	105	161	
Bihar	486	38	50	574	293	510	
Orissa	445	51	146	642	174	271	
West Bengal	250	52	64	366	223	609	
Assam	513	16	72	601	141	235	
Madras	323	18	44	385	275	714	
Mysore	492	13	95	600	114	190	
Travancore-Cochin	217	27	86	330	258	782	
Bombay	344	48	68	460	176	383	
Madhya Pradesh	377	75	93	545	225	413	
Madhya Bharat	439	23	60	522	207	397	
Hyderabad	330	44	95	469	238	507	
Rajasthan	389	16	66	471	256	544	
Punjab	376	11	30	417	235	564*	

NOTE:—Landholders Type A comprise of persons in Livelihood Class I, without subsidiary means of livelihood and those with subsidiary means in livelihood Class IV plus persons in Livelihood Class IV without subsidiary means of livelihood, and with subsidiary means in Livelihood Class I.

Landholders Type B comprise of persons in Livelihood Classes I and IV, with subsidiary means in Livelihood Class II or III plus persons in Livelihood Class II and Livelihood Class III with subsidiary means in Livelihood Class I or IV.

Landholders Type C comprise of persons in Livelihood Classes I and IV with subsidiary means in Livelihood Classes V to VIII plus persons in Livelihood Classes V to VIII with Subsidiary means in Livelihood Class I or IV.

* Exceptional due to temporary displaced 'persons' phenomena.

ANNEXURE
Agricultural Landholders and

India/Zones/Major States	Total			Without Subsidiary Income		
	Persons in 000's	Distribution per 10,000	Percentage of total population	Persons in 000's	Distribution per 10,000	Percentage of total population
I	2	3	4	5	6	7
LIVELIHOOD						
INDIA	45,760	10,000	46.93	38,157	8,339	39.14
North India	11,354	10,000	62.27	9,593	8,449	52.61
East India	12,839	10,000	50.07	10,579	8,240	41.26
South India	6,600	10,000	36.35	5,676	8,600	31.26
West India	3,746	10,000	39.75	3,049	8,139	32.35
Central India	6,479	10,000	47.38	5,038	7,776	36.84
North-West India	4,742	10,000	41.53	4,222	8,904	36.98
Uttar Pradesh	11,354	10,000	62.27	9,593	8,449	52.61
Bihar	7,119	10,000	55.29	6,157	8,649	47.82
Orissa	2,335	10,000	59.46	1,703	7,293	43.36
West Bengal	1,872	10,000	32.38	1,408	7,521	24.35
Assam	1,264	10,000	57.89	1,106	8,750	50.65
Madras	4,839	10,000	34.95	4,220	8,721	30.48
Mysore	1,197	10,000	55.46	1,016	8,488	47.07
Travancore-Cochin	547	10,000	26.34	424	7,751	20.42
Bombay	3,396	10,000	40.75	2,729	8,036	32.75
Madhya Pradesh	2,776	10,000	49.51	2,033	7,323	36.26
Madhya Bharat	1,221	10,000	50.43	1,034	8,469	42.71
Hyderabad	1,719	10,000	41.21	1,319	7,617	31.39
Rajasthan	2,512	10,000	43.30	2,172	8,646	37.44
Punjab	1,269	10,000	38.56	1,173	9,243	35.65
LIVELIHOOD						
INDIA	8,766	10,000	8.97	7,006	7,992	7.17
North India	991	10,000	5.15	729	7,356	3.79
East India	2,279	10,000	9.38	1,740	7,635	7.16
South India	1,506	10,000	8.70	1,262	8,380	7.29
West India	926	10,000	9.56	692	7,473	7.14
Central India	918	10,000	6.56	690	7,516	4.93
North-West India	2,146	10,000	17.32	1,893	8,821	15.27
Uttar Pradesh	991	10,000	5.15	729	7,356	3.79
Bihar	986	10,000	8.25	821	8,327	6.87
Orissa	231	10,000	5.93	133	5,757	3.41
West Bengal	748	10,000	12.05	527	7,045	8.48
Assam	277	10,000	12.81	228	8,231	10.54
Madras	1,234	10,000	9.58	1,049	8,501	8.14
Mysore	111	10,000	4.76	95	8,559	4.07
Travancore-Cochin	155	10,000	7.10	114	7,355	5.22
Bombay	837	10,000	9.66	611	7,300	7.05
Madhya Pradesh	457	10,000	4.47	374	8,184	3.66
Madhya Bharat	236	10,000	10.22	185	7,839	8.01
Hyderabad	323	10,000	7.39	249	7,709	5.69
Rajasthan	1,463	10,000	22.86	1,263	8,633	19.74
Punjab	519	10,000	16.12	480	9,249	14.91

Landless Agriculturists—1951

With Subsidiary Income (IV)			With Subsidiary Income (II & III)			With Subsidiary Income (V to VIII)		
Persons in 000's	Distribution per 10,000	Percentage of total population	Persons in 000's	Distribution per 10,000	Percentage of total population	Persons in 000's	Distribution per 10,000	Percentage of total population
8	9	10	11	12	13	14	15	16
CLASS I								
311	68	0.32	2,291	501	2.35	5,001	1,092	5.12
136	120	0.75	345	304	1.89	1,280	1,127	7.02
61	47	0.23	761	593	2.97	1,438	1,120	5.51
26	30	0.11	248	376	1.37	656	994	3.61
26	69	3.20	301	804	3.93	370	988	0.27
47	73	0.35	523	807	3.82	871	1,344	6.37
21	44	0.18	113	238	0.99	386	814	3.38
136	120	0.75	345	304	1.89	1,280	1,127	7.02
37	52	0.29	389	546	3.02	536	753	4.16
8	34	0.20	162	693	4.13	462	1,980	11.77
12	64	0.21	178	951	3.08	274	1,464	4.74
2	16	0.09	25	198	1.15	131	1,036	6.00
14	29	0.10	199	411	1.44	406	839	2.93
2	17	0.09	23	192	1.07	156	1,303	7.23
4	73	0.19	28	512	1.35	91	1,664	4.38
22	65	0.26	293	863	3.52	352	1,036	4.22
26	94	0.47	321	1,156	5.72	396	1,427	7.06
13	106	0.54	49	401	2.02	125	1,024	5.16
6	35	0.14	138	803	3.31	256	1,545	6.37
14	56	0.24	67	267	1.16	259	1,031	4.46
4	32	0.12	23	181	0.70	69	544	2.09
CLASS II*								
451	514	0.46	317	362	0.32	992	1,132	4.02
66	666	0.34	27	273	0.14	169	1,705	0.88
152	667	0.62	140	614	0.58	247	1,084	1.02
70	465	0.40	31	306	0.18	143	949	0.83
52	561	0.54	66	713	0.68	116	1,253	1.20
68	741	0.49	26	283	0.18	134	1,460	0.96
43	200	0.35	27	126	0.21	183	853	1.48
66	666	0.34	27	273	0.14	169	1,705	0.88
60	608	0.50	34	345	0.29	71	720	0.59
28	212	0.72	11	476	0.28	59	2,555	1.52
61	816	0.98	87	1,163	1.41	73	976	1.18
2	72	0.09	7	253	0.33	40	1,444	1.85
59	478	0.46	17	138	0.13	109	883	0.85
3	270	0.13	2	180	0.09	11	991	0.47
7	451	0.32	13	839	0.60	21	1,355	0.96
50	597	0.58	65	777	0.75	111	1,326	1.28
30	656	0.29	13	285	0.13	40	875	0.39
12	509	0.52	1	42	0.04	38	1,610	1.65
20	619	0.46	10	310	0.23	44	1,362	1.01
36	246	0.56	19	137	0.31	145	984	2.25
4	77	0.12	7	135	0.22	28	539	0.87

*Under Class II Cols. 8-10 relate to subsidiary income (III) and Cols. 11-13 relate to subsidiary income (I & III).

ANNEXURE
Agricultural Landholders and

India/Zones/Major States	Total			Without Subsidiary Income		
	Persons in 000's	Distribution per 10,000	Percentage of total population	Persons in 000's	Distribution per 10,000	Percentage of total population
1	2	3	4	5	6	7
LIVELIHOOD						
INDIA	14,882	10,000	12.57	13,502	9,072	11.40
North India	1,323	10,000	5.71	1,169	8,836	5.05
East India	4,566	10,000	15.34	4,088	8,953	13.73
South India	3,991	10,000	17.07	3,734	9,356	15.97
West India	1,066	10,000	8.42	959	8,996	7.57
Central India	3,316	10,000	17.37	2,980	8,987	15.79
North-West India	620	10,000	5.34	572	9,226	4.93
Uttar Pradesh	1,323	10,000	5.71	1,169	8,836	5.05
Bihar	2,863	10,000	21.86	2,628	9,179	20.07
Orissa	591	10,000	12.31	496	8,391	10.33
West Bengal	1,037	10,000	12.30	898	8,659	10.64
Assam	60	10,000	1.74	52	8,667	1.51
Madras	3,136	10,000	18.23	2,972	9,477	17.28
Mysore	220	10,000	6.79	206	9,364	6.36
Travancore-Cochin	625	10,000	20.17	550	8,800	17.75
Bombay	1,010	10,000	9.04	907	8,980	8.13
Madhya Pradesh	1,695	10,000	20.41	1,482	8,743	17.84
Madhya Bharat	349	10,000	10.67	322	9,226	9.85
Hyderabad	980	10,000	17.15	898	9,163	15.71
Rajasthan	204	10,000	3.16	180	8,824	2.79
Punjab	282	10,000	7.69	266	9,432	7.25
LIVELIHOOD						
INDIA	1,641	10,000	1.49	1,197	7,294	1.09
North India	254	10,000	1.06	206	8,110	0.86
East India	217	10,000	0.81	156	7,189	0.58
South India	472	10,000	2.15	363	7,691	1.66
West India	217	10,000	1.95	148	6,820	1.33
Central India	287	10,000	1.71	171	5,958	1.02
North-West India	194	10,000	1.79	152	7,835	1.40
Uttar Pradesh	254	10,000	1.06	206	8,110	0.86
Bihar	80	10,000	0.61	62	7,750	0.47
Orissa	67	10,000	1.51	41	6,119	0.92
West Bengal	38	10,000	0.60	28	7,369	0.44
Assam	22	10,000	0.90	14	6,364	0.57
Madras	358	10,000	2.17	281	7,849	1.70
Mysore	77	10,000	2.89	55	7,143	2.06
Travancore-Cochin	34	10,000	1.24	28	8,235	1.02
Bombay	198	10,000	2.00	134	6,768	1.35
Madhya Pradesh	122	10,000	1.62	70	5,738	0.93
Madhya Bharat	24	10,000	0.90	18	7,500	0.68
Hyderabad	129	10,000	2.41	76	5,891	1.42
Rajasthan	78	10,000	1.59	52	6,667	1.06
Punjab	77	10,000	2.15	65	8,442	1.82

Landless Agriculturists—1951—*contd.*

<i>With Subsidiary Income (I)</i>			<i>With Subsidiary Income (I & IV)</i>			<i>With Subsidiary Income (V to VIII)</i>		
<i>Persons in 000's</i>	<i>Distribution per 10,000</i>	<i>Percentage of total population</i>	<i>Persons in 000's</i>	<i>Distribution per 10,000</i>	<i>Percentage of total population</i>	<i>Persons in 000's</i>	<i>Distribution per 10,000</i>	<i>Percentage of total population</i>
8	9	10	11	12	13	14	15	16
CLASS III								
179	121	0.15	469	315	0.40	732	492	0.62
32	242	0.14	60	453	0.25	62	469	0.27
78	171	0.26	152	333	0.52	248	543	0.83
30	75	0.13	59	148	0.25	168	421	0.72
11	103	0.09	45	422	0.36	51	479	0.40
22	66	0.12	144	434	0.76	170	513	0.90
6	97	0.05	9	145	0.08	33	532	0.28
32	242	0.14	60	453	0.25	62	469	0.27
42	147	0.32	65	227	0.50	128	447	0.97
10	169	0.21	29	492	0.61	56	948	1.16
25	241	0.30	57	550	0.68	57	550	0.68
3	500	0.09	5	833	0.14	...	...	...
21	67	0.12	29	92	0.17	114	364	0.66
1	45	0.03	2	91	0.06	11	500	0.34
8	128	0.26	26	416	0.84	41	656	1.32
11	109	0.10	43	426	0.39	49	485	0.42
14	83	0.17	108	637	1.30	91	537	1.10
2	57	0.06	4	115	0.12	21	602	0.64
5	51	0.09	30	306	0.54	47	480	0.81
4	196	0.06	5	245	0.07	15	735	0.24
2	71	0.05	2	71	0.06	12	426	0.33
CLASS IV*								
45	274	0.04	92	561	0.08	307	1,871	0.28
11	433	0.04	4	158	0.02	33	1,299	0.14
10	461	0.04	6	276	0.02	45	2,074	0.17
7	148	0.03	11	233	0.04	91	1,928	0.42
7	323	0.06	14	645	0.13	48	2,212	0.43
3	105	0.02	51	1,777	0.30	62	2,160	0.37
7	361	0.06	5	258	0.05	30	1,546	0.28
11	433	0.04	4	158	0.02	33	1,299	0.14
5	625	0.04	3	375	0.03	10	1,250	0.07
2	299	0.05	3	448	0.07	21	3,134	0.47
2	526	0.03	1	263	0.02	7	1,842	0.11
...	...	...	...	...	...	8	3,636	0.33
4	112	0.02	9	251	0.06	64	1,788	0.39
...	...	...	2	260	0.08	20	2,597	0.75
1	294	0.04	...	...	...	5	1,471	0.18
6	303	0.06	14	707	0.14	44	2,222	0.45
1	82	0.01	28	2,295	0.37	23	1,885	0.31
...	...	...	2	833	0.07	4	1,667	0.15
1	78	0.02	19	1,475	0.35	33	2,556	0.62
6	769	0.12	3	385	0.06	17	2,179	0.35
1	130	0.03	3	390	0.08	8	1,038	0.22

*Under Class IV Cols. 8—10 relate to subsidiary income (I) and Cols. 11—13 relate to subsidiary income (II & III).

ANNEXURE
Agricultural Landholders and

India/Zones/Major States	Total			Without Subsidiary Income		
	Persons in 000's	Distribution per 10,000	Percentage of total population	Persons in 000's	Distribution per 10,000	Percentage of total population
1	2	3	4	5	6	7
						LIVELIHOOD
INDIA	33,340	10,000	30.15	29,520	8,855	26.70
North India	5,338	10,000	25.81	4,713	8,829	22.79
East India	7,826	10,000	24.40	6,942	8,870	21.64
South India	7,484	10,000	35.73	6,791	9,074	32.42
West India	4,973	10,000	40.32	4,462	8,972	36.18
Central India	4,191	10,000	26.78	3,501	8,354	22.37
North-West India	3,528	10,000	34.02	3,111	8,818	30.00
Uttar Pradesh	5,338	10,000	25.81	4,713	8,829	22.79
Bihar	1,657	10,000	13.95	1,435	8,660	12.08
Orissa	958	10,000	20.71	723	7,547	15.63
West Bengal	4,122	10,000	42.80	3,830	9,291	39.77
Assam	988	10,000	26.66	866	8,765	23.36
Madras	5,396	10,000	35.07	4,984	9,236	32.39
Mysore	757	10,000	30.10	685	9,049	27.24
Travancore-Cochin	1,287	10,000	45.15	1,083	8,415	37.99
Bombay	4,354	10,000	38.54	3,895	8,946	34.48
Madhya Pradesh	1,588	10,000	23.99	1,284	8,086	19.40
Madhya Bharat	687	10,000	27.78	602	8,763	24.34
Hyderabad	1,660	10,000	31.84	1,391	8,380	26.68
Rajasthan	1,409	10,000	29.12	1,138	8,077	23.52
Punjab	1,262	10,000	35.48	1,175	9,311	33.03

Landless Agriculturists—1951—*concl.*

With Subsidiary Income (I & IV)			With Subsidiary Income (II & III)			With Subsidiary Income (V to VIII)		
Persons in 000's	Distribution per 10,000	Percentage of total population	Persons in 000's	Distribution per 10,000	Percentage of total population	Persons in 000's	Distribution per 10,000	Percentage of total population
8	9	10	11	12	13	14	15	16
CLASSES V—VIII								
1,686	505	1.52	805	241	0.73	1,329	399	1.20
314	588	1.52	98	184	0.47	213	399	1.03
389	497	1.21	198	253	0.62	297	380	0.93
316	422	1.51	135	181	0.65	242	323	1.15
250	503	2.03	78	157	0.63	183	368	1.48
287	685	1.84	185	441	1.18	218	520	1.39
130	368	1.25	111	315	1.07	176	499	1.70
314	588	1.52	98	184	0.47	213	399	1.03
96	579	0.81	55	332	0.46	71	429	0.60
107	1,117	2.31	43	449	0.93	85	887	1.84
148	359	1.54	37	90	0.39	107	260	1.10
31	314	0.84	60	607	1.62	31	314	0.84
164	304	1.07	91	169	0.59	157	291	1.02
37	489	1.47	8	106	0.32	27	356	1.07
114	886	4.00	35	272	1.23	55	427	1.93
238	547	2.11	71	163	0.61	150	344	1.34
126	793	1.90	93	586	1.41	85	535	1.28
16	233	0.65	32	466	1.29	37	538	1.50
130	783	2.49	79	476	1.52	60	361	1.15
84	596	1.74	89	632	1.84	98	695	2.02
26	206	0.73	13	103	0.37	48	380	1.35

ANNEXURE

Classification of Population by Livelihood Classes and

Zone/State Livelihood Classes	Classification of						
	1961 Census					1931	
	Number per 10,000 of General Population					Number per	
	Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified population
1	2	3	4	5	6	7	8
INDIA	356,597,341	10,000	2,927	6,009	1,064	275,154,342	4,451
LIVELIHOOD CLASS I	167,322,511	4,692	1,283	2,807	602		1,031
Do. II	31,617,908	887	246	530	111		833
Do. III	44,808,888	1,256	417	691	148		1,017
Do. IV	5,321,183	149	46	93	10		89
Do. V	37,654,374	1,056	340	628	88		573
Do. VI	21,310,461	597	165	406	26		239
Do. VII	5,619,624	158	49	102	7		43
Do. VIII	42,942,392	1,205	381	752	72		626
NORTH INDIA	63,215,742	10,000	3,047	5,754	1,199	49,614,833	4,870
LIVELIHOOD CLASS I	39,361,035	6,227	1,796	3,551	880		362
Do. II	3,255,815	515	157	271	87		2,421
Do. III	3,612,209	571	210	280	81		690
Do. IV	667,612	106	40	62	4		91
Do. V	5,301,313	838	271	511	56		525
Do. VI	3,179,595	503	144	338	21		231
Do. VII	860,011	136	42	89	5		35
Do. VIII	6,978,152	1,104	387	652	65		515
Uttar Pradesh	63,215,742	10,000	3,047	5,754	1,199	49,614,833	4,870
LIVELIHOOD CLASS I	39,361,035	6,227	1,796	3,551	880		362
Do. II	3,255,815	515	157	271	87		2,421
Do. III	3,612,209	571	210	280	81		690
Do. IV	667,612	106	40	62	4		91
Do. V	5,301,313	838	271	511	56		525
Do. VI	3,179,595	503	144	338	21		231
Do. VII	860,011	136	42	89	5		35
Do. VIII	6,978,152	1,104	387	652	65		515

Active and Semi-active Workers at the 1931 and 1951 Census

Population			Active and Semi-active Workers					
Census			1951 Census			1931 Census		
M,000 of General Population								
Earners	Working dependents	Total Un-classified population (Non-working dependents)	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,761	690	5,549	104,388,469	15,008,924	37,918,321	103,522,483	12,884,028	18,970,100
909	122		45,760,373	1,963,592	12,647,232	25,009,972	1,324,570	3,348,442
683	150		8,765,328	1,466,769	2,498,282	18,802,494	1,651,988	4,121,611
798	219		14,881,181	2,380,291	12,515,363	21,967,741	1,865,133	6,026,886
81	8		11,641,097	864,959	274,442	2,220,191	678,548	231,929
486	87		12,130,498	3,141,671	4,368,306	13,394,657	2,241,834	2,394,675
218	21		5,902,338	1,530,173	1,324,407	6,004,214	1,234,517	564,840
41	2		1,733,866	346,789	224,602	1,130,173	245,286	43,381
545	81		13,573,788	3,314,680	4,065,687	14,993,041	3,642,152	2,238,336
4,176	694	5,130	19,259,510	2,850,616	7,579,806	20,718,172	2,951,496	3,441,300
262	100		11,354,100	362,753	5,148,436	1,301,389	147,182	494,147
1,974	447		990,910	194,731	440,365	9,791,415	790,278	2,220,206
633	57		1,322,468	349,925	692,030	3,138,667	492,568	280,518
83	8		254,053	185,586	24,629	412,991	245,119	41,496
484	41		1,714,932	660,404	477,900	2,402,030	507,728	202,968
217	14		912,618	248,166	148,895	1,077,085	250,771	70,023
34	1		263,805	78,624	20,667	170,506	35,772	1,869
489	26		2,446,624	770,427	626,884	2,424,089	482,078	130,073
4,176	694	5,130	19,259,510	2,850,616	7,579,806	20,718,172	2,951,496	3,441,300
262	100		11,354,100	362,753	5,148,436	1,301,389	147,182	494,147
1,974	447		990,910	194,731	440,365	9,791,415	790,278	2,220,206
633	57		1,322,468	349,925	692,030	3,138,667	492,568	280,518
83	8		254,053	185,586	24,629	412,991	245,119	41,496
484	41		1,714,932	660,404	477,900	2,402,030	507,728	202,968
217	14		912,618	248,166	148,895	1,077,085	250,771	70,023
34	1		263,805	78,624	20,667	170,506	35,772	1,869
489	26		2,446,624	770,427	626,884	2,424,089	482,078	130,073

ANNEXURE
Classification of Population by Livelihood Classes and

Classification of

		1951 Census					1931	
		Number per 10,000 of General Population				Number per		
Zone/State Livelihood Classes	Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified population	
1	2	3	4	5	6	7	8	
EAST INDIA	90,130,206	10,000	3,076	6,326	598	69,726,495	4,190	
LIVELIHOOD CLASS I	45,129,927	5,007	1,424	3,235	348		1,541	
Do. II	8,459,193	939	253	616	70		345	
Do. III	13,830,875	1,535	507	951	77		871	
Do. IV	721,202	80	24	51	5		56	
Do. V	7,746,036	859	349	472	38		544	
Do. VI	4,537,932	504	158	329	17		202	
Do. VII	1,251,940	138	52	82	4		42	
Do. VIII	8,453,101	938	309	590	39		499	
Bihar	40,225,947	10,000	3,159	6,433	408	32,556,239	4,154	
LIVELIHOOD CLASS I	22,242,486	5,530	1,770	3,529	231		2,308	
Do. II	3,326,677	827	245	544	38		"	
Do. III	8,795,202	2,187	712	1,399	76		870	
Do. IV	246,889	61	20	37	4		29	
Do. V	1,584,668	394	131	247	16		271	
Do. VI	1,368,007	339	93	232	14		198	
Do. VII	291,116	73	22	47	4		21	
Do. VIII	2,370,902	589	166	398	25		457	
Orissa	14,645,946	10,000	2,856	6,179	965	12,491,056	4,504	
LIVELIHOOD CLASS I	18,718,822	5,953	1,595	3,799	559		253	
Do. II	1,803,973	594	158	367	69		407	
Do. III	1,803,968	1,231	403	679	149		1,166	
Do. IV	219,827	150	146	96	8		40	
Do. V	2,267,788	633	206	360	67		617	
Do. VI	425,852	291	95	175	21		200	
Do. VII	77,538	53	15	95	7		12	
Do. VIII	1,603,400	1,095	338	668	89		809	

Active and Semi-active Workers at the 1931 and 1951 Census—contd.

Population		Active and Semi-active Workers						
Census		1951 Census			1931 Census			
10,000 of General Population								
Earners	Working dependents	Total unclassified population (Non-working dependents)	Self-supporting Persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,728	372	5,900	27,726,838	4,224,641	5,389,707	26,001,715	2,870,802	2,597,726
1,488	53		12,839,024	628,995	1,352,207	10,376,863	391,382	370,433
337	8		2,278,925	482,639	469,424	2,348,315	179,190	55,516
751	120		4,566,376	714,007	1,255,104	5,237,172	488,452	838,517
55	1		216,217	123,384	60,323	386,571	124,490	8,431
466	78		3,145,570	742,870	979,225	3,252,685	646,564	547,281
195	7		1,419,797	532,526	376,127	1,361,342	362,335	46,708
41	1		478,021	94,807	67,081	283,477	61,749	3,213
395	104		2,782,908	905,413	830,216	2,755,290	616,640	727,627
4,050	104	5,846	12,706,699	1,601,443	1,637,496	13,184,952	1,193,215	339,568
2,262	46		7,118,833	186,871	323,045	7,363,246	211,374	150,508
...	...		985,856	170,872	160,701	...	...	...
847	23		2,863,136	378,100	464,439	2,758,931	229,180	73,930
28	1		81,774	51,605	40,988	91,496	39,478	2,487
257	14		526,231	254,888	210,502	837,280	252,991	46,358
196	2		375,996	195,581	144,192	638,559	166,641	7,120
21	...		87,434	49,350	40,450	68,020	21,130	381
439	18		667,439	314,176	253,179	1,427,420	272,421	58,784
3,773	731	5,496	4,182,456	1,084,783	1,413,486	4,710,330	806,671	914,327
235	18		2,335,636	121,528	222,767	292,983	17,254	22,677
1,370	37		231,374	84,260	47,530	1,711,202	98,588	46,829
917	249		591,074	161,201	416,016	1,144,821	137,657	311,571
38	2		66,523	35,566	8,763	47,306	14,924	1,925
522	95		301,429	225,928	250,126	651,608	198,895	118,262
182	18		138,539	119,689	98,521	227,030	102,863	22,677
12	...		22,340	16,815	7,693	15,128	16,409	368
497	312		495,541	319,796	362,070	620,252	220,081	390,018

ANNEXURE

Classification of Population by Livelihood Classes and

		1951 Census					Classification of	
		Number per 10,000 of General Population					Number per	
Zone /State Livelihood Classes	Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified population	
1	2	3	4	5	6	7	8 ^a	
West Bengal	24,810,308	10,000	3,149	6,533	318	17,663,427	3,404	
LIVELIHOOD CLASS I	8,023,757	3,234	754	2,360	120		850	
Do. II	2,980,402	1,201	301	840	60		205	
Do. III	3,041,881	1,226	418	751	57		764	
Do. IV	149,121	60	16	43	1		136	
Do. V	3,811,300	1,536	671	832	33		643	
Do. VI	2,311,309	932	312	606	14		236	
Do. VII	756,297	305	131	170	4		91	
Do. VIII	3,736,241	1,506	546	931	29		479	
Chandernagore	49,900	10,000	3,461	6,600	30		...	
LIVELIHOOD CLASS I	60	12	4	8	...		...
Do. II	32	6	...	6	...		...
Do. III	15	3	1	2	...		...
Do. IV	253	51	9	42	...		...
Do. V	15,880	3,182	1,236	1,933	13		...	
Do. VI	13,101	2,625	927	1,689	9		...	
Do. VII	3,108	623	227	393	3		...	
Do. VIII	17,460	3,498	1,057	2,427	14		...	
Assam	9,043,707	10,000	2,889	5,687	1,424	8,077,909	5,032	
LIVELIHOOD CLASS I	5,235,791	5,789	1,398	3,401	990		1,977	
Do. II	1,158,254	1,281	306	751	224		365	
Do. III	157,343	174	67	83	24		676	
Do. IV	81,604	90	25	55	10		12	
Do. V	1,327,551	1,468	686	685	97		1,581	
Do. VI	353,066	390	117	243	30		139	
Do. VII	115,569]	128	41	83	4		66	
Do. VIII	614,529	680	249	386	45		206	

II

Active and Semi-active Workers at the 1931 and 1951 Census—*contd.*

Population			Active and Semi-active Workers					
Census			1951 Census			1931 Census		
10,000 of General Population			Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
Earners	Working dependents	Total Un-classified population (Non-working dependents)	12	13	14	15	16	17
3,192	212	6,596	7,816,750	1,125,629	787,390	5,639,770	504,496	373,303
850	...		1,871,483	282,121	65,664	1,501,195	66,723	...
205	...		747,845	144,751	83,525	362,881	19,647	...
727	37		1,036,365	158,626	261,243	1,284,424	110,069	65,321
134	2		38,917	23,241	5,028	237,286	62,191	3,357
624	19		1,665,675	157,346	170,701	1,102,563	78,555	32,611
232	4		774,816	153,246	74,326	409,922	60,198	7,086
90	1		326,054	21,312	11,351	158,826	10,934	1,107
330	149		1,355,595	184,986	115,552	582,673	96,179	263,821
...	...		17,274	406	186	...	...	...
...	...		22	50	2	...	...	...
...	...		2	3	1	...	...	...
...	...		5	...	1	...	...	...
...	...		46	10	...	...	...	...
...	...		6,167	34	42	...	...	...
...	...		4,626	85	56	...	...	...
...	...		1,130	7	...	...	...	...
...	...		5,276	217	93	...	...	...
3,609	1,413	4,978	2,612,286	343,359	1,287,969	2,193,456	337,942	858,443
1,755	222		1,264,023	34,200	657,124	1,066,767	86,650	135,187
355	10		276,986	76,634	161,070	215,828	58,883	5,901
68	608		60,310	11,635	65,997	41,183	10,801	369,760
11	1		22,379	8,606	3,450	6,621	7,206	402
1,047	534		620,097	77,740	263,737	636,419	105,540	324,390
125	14		106,293	55,010	144,409	75,793	30,082	8,321
64	2		37,488	5,748	5,805	39,096	12,901	1,274
484	22		224,710	73,786	86,377	111,749	25,879	13,208

ANNEXURE

Classification of Population by Livelihood Classes and

		Classification of					
		1951 Census				1981	
		Number per 10,000 of General population				Number per	
Zone/State Livelihood Classes	Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified population
I.	2	3	4	5	6	7	8
Manipur	577,635	10,000	2,718	4,796	2,486	445,606	4,601
LIVELIHOOD CLASS I	411,362	7,121	1,939	3,519	1,663		2,952
Do. II	57,738	1,000	272	409	319		218
Do. III	1,381	24	6	10	8		296
Do. IV	11,536	200	52	93	55		59
Do. V	40,331	698	190	304	204		760
Do. VI	24,124	418	111	195	112		169
Do. VII	3,070	53	14	27	12		18
Do. VIII	28,093	486	134	239	113		129
Tripura	639,029	10,000	3,147	5,703	1,150	382,450	2,800
LIVELIHOOD CLASS I	382,147	5,980	1,772	3,333	875		1,702
Do. II	55,930	875	290	464	121		69
Do. III	30,886	483	235	206	42		321
Do. IV	11,918	187	56	120	11		39
Do. V	38,395	691	227	328	46		350
Do. VI	40,838	639	195	423	211		87
Do. VII	3,314	52	14	36	2		43
Do. VIII	75,601	1,183	358	793	32		189
Sikkim	137,725	10,000	2,412	4,237	3,351	109,808	1,668
LIVELIHOOD CLASS I	115,502	8,386	1,727	3,468	3,191		1,648
Do. II	10,409	756	191	424	141		4,447
Do. III	199	14	6	6	2		28
Do. IV	54	4	1	3	...		3
Do. V	1,123	82	36	40	6		293
Do. VI	1,635	119	47	71	1		59
Do. VII	1,928	140	133	6	1		6
Do. VIII	6,875	499	271	219	9		184

Active and Semi-active Workers at the 1931 and 1951 Census—contd.

Population			Active and Semi-active Workers					
Census			1951 Census			1931 Census		
10,000 of General population								
Earners	Working dependents	Total Un-classified population (Non-working dependents)	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
2,512	2,089	5,399	157,030	30,780	143,612	111,915	14,307	93,068
1,706	1,246		112,017	1,385	48,473	76,024	1,462	55,539
155	63		15,703	697	8,701	6,930	117	2,786
8	288		366	179	402	344	114	12,807
53	6		2,993	1,763	591	2,348	455	255
319	441		10,961	20,527	70,457	14,220	9,184	19,650
139	30		6,420	3,267	10,215	6,207	2,089	1,350
17	1		821	229	833	738	268	59
115	14		7,749	2,733	3,940	5,104	618	622
2,352	448	7,200	201,121	37,939	73,419	89,928	9,990	17,134
1,531	171		113,222	2,791	31,678	58,554	7,487	6,522
69	...		18,528	5,401	4,494	2,646	423	...
188	133		15,032	4,258	8,782	7,190	625	5,094
99	...		3,579	2,593	1,503	1,478	234	5
217	133		14,517	6,307	13,544	8,302	209	5,088
83	4		12,462	5,620	4,354	3,184	894	153
42	1		918	1,542	934	1,601	80	24
183	6		22,863	9,627	8,130	6,993	538	248
6,497	171	3,332	33,222	302	46,140	71,344	4,181	1,883
1,648	...		23,788	49	3,454	18,094	432	...
4,447	...		2,631	21	3,402	48,828	1,532	...
25	3		88	8	38,224	279	6	34
3	...		6	...	...	36	2	...
209	84		493	100	116	2,293	1,190	922
59	...		645	28	54	647	68	1
6	...		1,836	4	15	68	27	...
100	84		3,735	92	875	1,099	924	926

ANNEXURE

Classification of Population by Livelihood Classes and

		1961 Census						1931	
		Number per 10,000 of General Population				Number per			
Zone/State Livelihood Classes		Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified population	
I		2	3	4	5	6	7	8	
SOUTH INDIA		75,600,804	10,000	2,652	6,856	492	57,671,101	4,174	
LIVELIHOOD CLASS I		27,480,839	3,635	873	2,606	156		1,135	
Do.	II	6,578,853	870	199	624	47		274	
Do.	III	12,905,515	1,707	528	1,062	117		972	
Do.	IV	1,622,579	214	62	145	7		106	
Do.	V	9,993,266	1,322	376	869	77		574	
Do.	VI	4,955,811	656	163	471	22		219	
Do.	VII	1,382,285	183	47	127	9		46	
Do.	VIII	10,681,656	1,413	404	952	57		848	
Madras		57,016,002	10,000	2,625	6,903	472	44,649,483	4,174	
LIVELIHOOD CLASS I		19,926,000	3,495	849	2,493	153		1,021	
Do.	II	5,464,261	958	216	692	50		286	
Do.	III	10,393,362	1,823	550	1,155	118		1,065	
Do.	IV	1,238,167	217	63	147	7		121	
Do.	V	7,042,941	1,235	338	836	61		536	
Do.	VI	3,811,470	669	167	482	20		210	
Do.	VII	958,845	162	43	119	6		46	
Do.	VIII	8,180,956	1,435	399	979	57		889	
Mysore		9,074,972	10,000	2,601	7,061	338	6,557,302	4,554	
LIVELIHOOD CLASS I		5,032,787	5,546	1,319	4,056	171		2,161	
Do.	II	432,415	477	122	332	23		297	
Do.	III	615,853	678	242	414	22		689	
Do.	IV	262,305	290	85	196	9		73	
Do.	V	929,622	1,025	282	700	43		518	
Do.	VI	505,154	556	135	403	18		196	
Do.	VII	104,894	115	28	83	4		29	
Do.	VIII	1,191,942	1,313	388	877	48		591	

II

Active and Semi-active Workers at the 1931 and 1951 Census—contd.

Population		Active and Semi-active Workers						
Census		1951 Census			1931 Census			
10,000 of General Population								
Earners	Working dependents	Total Un-classified population (Non-working dependents)	Self-supporting persons	Secondary of Self-supporting Persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,724	450	5,826	20,052,531	2,223,974	3,720,362	21,479,929	3,383,736	2,597,245
1,052	83		6,600,404	303,282	403,901	6,066,625	356,671	479,466
252	22		1,505,806	166,057	130,225	1,454,032	128,129	125,291
808	164		3,990,887	327,550	1,379,309	4,660,454	281,026	946,453
101	5		471,427	129,129	39,319	582,570	69,069	31,728
483	91		2,841,879	473,659	856,122	2,785,088	374,764	526,254
208	11		1,230,727	256,159	209,372	1,201,516	221,225	62,854
44	2		358,869	44,948	47,573	255,859	87,520	8,657
776	72		3,052,532	523,190	654,541	4,473,785	1,865,332	416,542
3,830	344	5,826	14,962,541	1,458,070	2,696,192	17,100,394	2,534,358	1,538,450
988	33		4,839,046	145,359	284,788	4,413,959	113,405	146,668
273	13		1,233,979	108,980	93,027	1,219,706	93,014	59,695
901	164		3,135,681	269,761	1,159,387	4,021,881	229,140	734,922
115	6		358,086	83,314	26,058	512,228	55,855	26,469
461	75		1,926,442	303,188	446,528	2,055,938	250,124	335,387
200	10		948,791	176,742	152,285	895,789	159,812	43,067
45	1		244,107	30,457	28,091	198,360	67,835	6,144
847	42		2,276,409	340,269	506,028	3,782,533	1,565,173	186,698
3,584	970	5,446	2,360,576	305,527	306,862	2,350,010	243,111	636,220
1,768	393		1,196,773	15,428	54,536	1,158,939	15,439	257,736
219	78		110,591	16,435	20,123	143,674	7,550	51,430
413	276		220,171	20,502	44,393	270,821	19,067	180,887
66	7		76,809	27,790	4,691	43,461	6,319	4,848
363	155		255,658	89,471	78,451	238,162	73,483	101,656
185	11		122,393	39,464	25,107	121,604	32,967	7,191
28	1		25,138	2,858	3,561	18,187	12,932	486
542	49		353,043	93,579	76,000	355,162	75,354	31,986

ANNEXURE

Classification of Population by Livelihood Classes and

Zone | State Livelihood Classes	Classification of						
	1951 Census					1931	
	Number per 10,000 of General Population					Number per	
	Total number	Total classified population	Self-supporting persons	Non-earning dependents	Earning dependents	Total number	Total classified population
1	2	3	4	5	6	7	8
Travancore-Cochin	9,280,425	10,000	2,854	6,385	761	6,300,989	3,714
LIVELIHOOD CLASS I	2,444,514	2,634	590	1,883	161		862
Do. II	659,106	710	167	493	50		164
Do. III	1,871,767	2,016	673	1,141	202		604
Do. IV	114,919	124	37	82	5		40
Do. V	1,966,244	2,118	681	1,233	204		894
Do. VI	631,243	681	169	473	39		308
Do. VII	316,438	341	96	216	29		64
Do. VIII	1,276,194	1,376	441	864	71		778
Coorg.	229,405	10,000	3,537	6,000	463	163,327	6,837
LIVELIHOOD CLASS I	77,538	3,380	743	2,533	104		1,554
Do. II	23,071	1,006	270	685	51		76
Do. III	24,533	1,069	452	520	97		1,101
Do. IV	7,188	313	89	218	6		145
Do. V	54,459	2,374	1,213	1,012	149		1,019
Do. VI	7,944	346	117	220	9		173
Do. VII	2,108	92	38	52	2		77
Do. VIII	32,564	1,420	615	760	45		2,692
WEST INDIA	40,661,115	10,000	2,688	5,730	1,582	28,599,788	4,049
LIVELIHOOD Class I	16,162,774	3,975	921	2,201	853		599
Do. II	3,824,511	955	227	506	222		472
Do. III	3,425,026	842	262	401	179		1,444
Do. IV	793,683	196	54	126	16		64
Do. V	5,801,574	2,427	439	844	144		580
Do. VI	3,244,830	798	219	541	38		242
Do. VII	923,344	227	68	148	11		51
Do. VIII	6,425,373	1,580	498	963	119		597

Active and Semi-active Workers at the 1931 and 1951 Census—*contd.*

Population			Active and Semi-active workers					
Census			1951 Census			1931 Census		
10,000 of General Population								
Earners	Working dependents	Total Un-classified population (Non-working dependents)	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,087	627	6,286	2,648,254	448,818	706,682	1,944,952	592,712	395,475
743	119		547,531	142,006	64,105	468,372	227,603	75,032
142	22		155,049	40,333	16,800	89,491	27,545	14,090
556	48		624,661	37,092	174,512	349,981	32,001	30,425
39	1		34,480	16,300	8,425	24,524	6,478	398
753	141		631,961	76,720	327,340	474,724	49,900	88,833
288	20		156,850	39,338	31,739	181,335	27,721	12,558
61	3		88,749	11,519	15,863	38,076	5,920	2,002
505	273		408,973	85,510	67,898	318,449	215,544	172,137
5,178	1,659	3,163	81,160	11,559	10,626	84,573	13,555	27,100
1,552	2		17,054	489	472	25,355	224	30
71	5		6,187	309	275	1,161	20	76
1,088	13		10,374	195	1,017	17,771	818	219
144	1		2,052	1,725	145	2,357	417	13
996	23		27,818	4,280	3,803	16,264	1,257	378
171	2		2,693	615	241	2,788	725	38
76	1		875	114	58	1,236	833	25
1,080	1,612		14,107	3,832	4,615	17,641	9,261	26,321
3,274	775	5,951	10,927,720	1,618,315	6,433,100	9,363,165	593,752	2,216,940
509	90		3,745,668	225,668	2,443,927	1,456,325	49,170	257,830
422	50		925,586	220,384	657,860	1,206,374	74,712	141,530
1,016	428		1,066,049	237,090	1,925,241	2,904,622	150,150	1,224,585
61	3		217,257	168,228	45,487	175,633	31,410	9,636
480	100		1,782,760	261,548	551,896	1,371,830	108,245	286,341
221	21		887,580	133,534	194,549	631,529	52,443	60,349
49	2		277,392	142,770	28,379	139,669	13,768	6,508
516	81		2,025,428	329,093	585,761	1,477,183	113,854	230,161

ANNEXURE

Classification of Population by Livelihood Classes and

<i>Classification of</i>							
<i>1951 Census</i>							
<i>Number per 10,000 of General Population</i>							
<i>1931</i>							
<i>Number per</i>							
<i>Zone/State Livelihood Classes</i>	<i>Total number</i>	<i>Total classified population</i>	<i>Self- supporting persons</i>	<i>Non- earning dependents</i>	<i>Earning dependents</i>	<i>Total number</i>	<i>Total classified population</i>
1	2	3	4	5	6	7	8
Bombay	35,956,150	10,000	2,723	5,719	1,558	25,138,800	4,081
LIVELIHOOD CLASS I	14,648,885	4,074	944	2,277	853		659
Do. II	3,485,020	969	233	517	219		426
Do. III	3,252,546	905	281	433	191		1,514
Do. IV	711,842	198	55	127	16		64
Do. V	4,949,157	1,376	438	811	127		565
Do. VI	2,736,313	761	217	508	36		233
Do. VII	802,188	223	69	144	10		49
Do. VIII	5,370,199	1,494	486	902	106		571
Saurashtra	4,137,359	10,000	2,354	5,827	1,819	2,946,681	3,772
LIVELIHOOD CLASS I	1,355,604	3,277	739	1,645	893		151
Do. II	345,156	834	182	412	240		857
Do. III	155,585	376	118	161	97		855
Do. IV	72,775	176	43	120	13		69
Do. V	743,679	1,797	428	1,092	277		651
Do. VI	444,364	1,074	223	790	61		296
Do. VII	197,095	259	64	182	13		66
Do. VIII	913,101	2,207	557	1,425	225		827
Kutch	567,606	10,000	2,843	5,730	1,427	514,307	4,051
LIVELIHOOD CLASS I	158,285	2,788	778	1,412	598		232
Do. II	54,335	957	242	502	213		464
Do. III	16,895	298	126	127	45		1,405
Do. IV	9,066	160	46	106	8		70
Do. V	108,738	1,916	522	1,131	263		874
Do. VI	64,153	1,130	239	844	47		366
Do. VII	14,061	248	76	160	12		69
Do. VIII	142,073	2,503	814	1,448	241		571

II

Active and Semi-active Workers at the 1931 and 1951 Census—contd.

Population			Active and Semi-active Workers					
Census			1951 Census			1931 Census		
10,000 of General Population								
Earners	Working dependents	Total Un-classified population (Non-working dependents)	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,369	712	5,919	9,792,261	1,517,918	5,599,342	8,468,051	571,566	1,791,845
564	95		3,395,691	215,104	2,192,470	1,417,737	47,939	239,936
385	41		836,624	212,706	599,567	967,504	72,411	103,888
1,118	396		1,009,842	227,187	1,677,602	2,809,714	146,657	995,164
61	3		197,054	157,928	40,426	153,292	30,775	8,002
474	91		1,575,997	245,517	451,516	1,191,930	103,848	229,446
216	17		781,544	121,235	158,849	543,422	48,089	42,289
47	2		246,832	39,312	23,651	118,857	13,393	4,534
504	67		1,748,677	298,929	455,261	1,265,595	108,454	168,586
2,558	1,214	6,228	974,055	75,611	752,752	753,878	15,976	357,978
91	60		305,835	7,886	236,968	26,751	842	17,782
730	127		75,228	4,386	53,024	215,189	1,828	37,437
235	620		49,066	8,631	223,084	69,341	2,272	182,701
64	5		17,568	7,775	4,744	18,819	407	1,591
495	156		177,119	12,149	90,705	145,973	2,885	45,896
245	51		92,472	10,194	32,457	72,213	3,162	15,124
60	6		26,226	1,427	4,283	17,564	329	1,679
638	189		230,541	23,163	107,487	188,028	4,251	55,768
2,746	1,305	5,949	161,404	24,786	81,006	141,236	6,210	67,117
230	2		44,142	2,678	14,489	11,837	389	112
460	4		13,734	3,292	5,269	23,681	473	205
497	908		7,141	1,272	24,555	25,567	1,221	46,720
69	1		2,635	2,525	317	3,522	228	43
660	214		29,644	3,882	9,675	33,927	1,512	10,999
309	57		13,564	2,105	3,243	15,894	1,192	2,936
63	6		4,334	2,031	445	3,248	46	295
458	113		46,210	7,001	23,013	23,560	1,149	5,807

ANNEXURE

Classification of Population by Livelihood Classes and

		1951 Census						1931	
		Number per 10,000 of General Population				Number per			
Zone/State Livelihood Classes		Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified population	
I		2	3	4	5	6	7	8	
CENTRAL INDIA	.	52,267,959	10,000	2,907	5,095	1,998	42,422,453	5,089	
LIVELIHOOD CLASS	I	24,767,467	4,738	1,240	2,428	1,070		1,256	
Do.	II	3,427,226	656	176	333	147		543	
Do.	III	9,181,910	1,756	634	691	431		1,480	
Do.	IV	894,200	171	55	90	26		135	
Do.	V	5,822,200	1,115	329	602	184		647	
Do.	VI	2,485,483	476	131	310	35		332	
Do.	VII	668,532	128	37	82	9		40	
Do.	VIII	5,020,941	960	305	559	96		656	
Madhya Pradesh	.	21,247,533	10,000	3,031	4,430	2,539	17,990,937	5,280	
LIVELIHOOD CLASS	I	10,519,128	4,951	1,307	2,200	1,444		1,917	
Do.	II	949,762	447	121	182	144		82	
Do.	III	4,336,281	2,040	798	666	576		2,075	
Do.	IV	343,708	162	58	75	29		32	
Do.	V	2,252,033	1,060	333	524	203		548	
Do.	VI	932,601	439	125	274	40		203	
Do.	VII	311,818	147	43	93	11		33	
Do.	VIII	1,602,202	754	246	416	92		390	
Madhya Bharat	.	7,954,154	10,000	3,167	5,871	962	6,297,861	4,991	
LIVELIHOOD CLASS	I	4,011,371	5,043	1,535	2,942	566		1,169	
Do.	II	812,476	1,021	298	622	101		926	
Do.	III	848,618	1,067	438	497	132		1,118	
Do.	IV	71,941	91	31	51	9		102	
Do.	V	792,491	996	319	605	72		644	
Do.	VI	446,571	561	152	389	20		274	
Do.	VII	84,770	107	31	72	4		50	
Do.	VIII	885,916	1,114	363	693	58		708	

Active and Semi-active Workers at the 1931 and 1951 Census—*contd.*

Population			Active and Semi-active Workers					
Census			1951 Census			1981 Census		
10,000 of General Population								
Earners	Working dependents	Total un-classified Population (Non-working dependents)	Self-supporting persons	Secondary of Self Supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,975	1,114	4,911	15,192,757	2,814,500	10,431,105	16,861,262	2,078,353	4,724,845
923	333		6,479,461	321,383	1,607,904	3,913,955	288,291	1,411,339
396	147		918,106	261,912	262,571	1,680,487	222,918	622,876
1,224	256		3,316,070	614,673	6,561,893	5,193,008	358,981	1,086,814
104	31		287,495	185,456	39,967	443,885	114,367	130,483
513	134		1,717,770	655,594	912,017	2,174,390	414,126	571,018
264	68		684,749	251,808	239,116	1,118,567	265,612	287,254
35	5		193,073	61,592	32,991	148,841	28,561	19,079
516	140		1,596,033	462,082	774,646	2,188,129	385,497	595,982
4,196	1,084	4,720	6,438,898	1,394,452	5,397,140	7,550,262	600,099	1,951,169
1,321	596		2,776,498	177,812	809,019	2,375,708	109,944	1,072,879
70	12		256,616	125,467	49,150	126,193	17,655	21,539
1,751	324		1,695,610	360,846	3,648,407	3,150,903	135,812	582,490
30	2		122,169	97,094	15,524	54,055	23,235	4,011
448	100		708,081	300,574	407,350	806,668	129,719	179,644
183	20		265,200	137,639	107,089	329,978	89,698	36,641
32	1		91,137	41,120	15,523	57,190	13,522	1,357
361	29		523,587	153,900	345,078	649,567	80,514	52,608
4,434	557	5,009	2,518,318	356,487	764,311	2,792,919	304,525	350,437
1,071	98		1,220,861	16,758	102,487	674,741	31,308	61,855
806	120		237,084	34,654	96,336	507,278	39,046	76,139
941	177		348,567	61,798	357,866	592,657	44,082	111,337
95	7		24,711	18,088	6,565	59,908	16,039	4,285
574	70		253,654	111,642	107,586	361,348	52,987	44,235
257	17		120,630	33,815	26,115	161,989	29,179	10,436
49	1		24,323	5,504	3,152	30,499	5,798	802
641	67		288,488	74,228	64,204	404,499	86,086	41,348

ANNEXURE

Classification of Population by Livelihood Classes and

		1951 Census					Classification of	
		Number per 10,000 of General Population					Number per	
Zone / State Livelihood Classes	Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified Population	
1	2	3	4	5	6	7	8	
Hyderabad	18,655,108	10,000	2,579	5,433	1,988	14,436,148	4,713	
LIVELIHOOD CLASS I	7,687,627	4,122	922	2,274	926		731	
Do. II	1,377,934	738	173	381	184		347	
Do. III	3,199,773	1,715	525	761	429		914	
Do. IV	449,490	241	69	139	33		306	
Do. V	2,525,501	1,354	359	757	238		769	
Do. VI	954,516	511	135	339	37		551	
Do. VII	243,192	130	36	84	10		49	
Do. VIII	2,217,075	1,189	360	698	131		1,046	
Bhopal	836,474	10,000	3,567	5,856	577	729,955	4,528	
LIVELIHOOD CLASS I	311,138	3,719	1,228	2,219	272		1,082	
Do. II	59,659	713	266	406	41		829	
Do. III	167,425	2,002	841	1,047	114		980	
Do. IV	10,108	121	46	67	8		95	
Do. V	87,944	1,051	384	597	70		585	
Do. VI	51,759	619	186	412	21		257	
Do. VII	13,287	159	61	96	2		48	
Do. VIII	135,154	1,616	555	1,012	49		652	
Vindhya Pradesh	3,574,690	10,000	3,150	5,383	1,467	2,967,552	6,093	
LIVELIHOOD CLASS I	2,238,203	6,261	1,847	3,498	916		18	
Do. II	227,395	636	222	314	100		3,403	
Do. III	629,813	1,762	620	821	321		1,521	
Do. IV	18,953	53	20	27	6		15	
Do. V	164,231	460	151	250	59		675	
Do. VI	100,036	280	88	170	22		179	
Do. VII	15,465	43	15	26	2		16	
Do. VIII	180,594	505	187	277	41		266	

II

Active and Semi-active Workers at the 1931 and 1951 Census—contd.

Population			Active and Semi-active Workers					
Census			1951 Census			1931 Census		
10,000 of General Population								
Earners	Working dependents	Total Un-classified population (Non-working dependents)	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,342	1,371	5,287	4,811,189	878,483	3,709,294	4,823,882	965,735	1,978,632
541	190		1,719,132	109,507	455,518	781,649	144,359	274,183
261	86		322,863	93,742	91,593	377,377	73,088	124,517
653	261		979,777	167,252	2,376,304	942,348	160,232	377,082
221	85		129,508	67,477	15,721	318,697	72,756	121,996
543	226		670,051	183,062	340,916	783,842	179,028	326,758
386	165		252,127	60,283	89,371	557,206	129,424	237,805
37	12		67,015	11,615	12,442	52,861	6,204	16,805
700	346		670,716	185,545	327,429	1,009,902	200,644	499,486
4,346	182	5,472	298,237	32,356	48,436	317,253	19,502	13,331
1,050	32		102,715	1,348	8,144	76,646	2,005	2,353
789	40		22,226	3,192	3,554	57,624	2,501	2,896
922	58		70,349	6,679	19,333	67,321	2,823	4,236
93	2		3,811	225	169	6,805	1,027	163
562	23		32,088	9,150	8,551	41,046	3,393	1,683
252	5		15,516	3,634	2,498	18,401	1,868	397
48	...		5,120	600	563	3,465	372	30
680	22		46,412	7,528	5,624	45,945	15,513	1,573
4,640	1,453	3,907	1,126,115	152,722	511,924	1,376,946	188,492	431,276
18	...		660,255	15,958	232,736	5,211	675	69
2,062	1,841		79,317	4,857	21,938	612,015	90,628	397,785
1,482	39		221,767	18,098	159,983	439,779	16,032	11,669
16	...		7,296	2,572	1,988	14,420	1,310	28
612	63		53,896	51,166	47,614	181,486	48,999	18,698
172	7		31,276	16,437	14,043	50,993	15,443	1,975
16	...		5,478	2,753	1,311	4,826	2,665	85
263	3		66,830	40,881	32,311	78,216	12,740	967

ANNEXURE

Classification of Population by Livelihood Classes and

		1951 Census					1931	
		Number per 10,000 of General Population				Number per		
Zone/State Livelihood Classes	Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified population	
I	2	3	4	5	6	7	8	
NORTH-WEST INDIA	34,721,515	10,000	3,234	5,509	1,257	27,119,672	4,606	
LIVELIHOOD CLASS I	14,420,469	4,153	1,366	2,066	721		823	
Do. II	6,012,310	1,731	618	898	215		1,209	
Do. III	1,853,353	534	178	293	63		916	
Do. IV	621,907	179	56	107	16		85	
Do. V	2,989,985	861	267	509	85		615	
Do. VI	2,906,810	838	221	576	41		240	
Do. VII	533,512	154	47	101	6		50	
Do. VIII	5,383,169	1,550	481	959	110		668	
Rajasthan	15,290,797	10,000	3,706	4,956	1,338	11,225,712	5,278	
LIVELIHOOD CLASS I	6,621,892	4,330	1,642	1,907	781		239	
Do. II	3,495,773	2,286	957	1,052	277		1,549	
Do. III	474,996	311	134	134	43		1,739	
Do. IV	244,278	160	51	95	14		56	
Do. V	1,357,936	888	298	488	102		658	
Do. VI	1,005,845	658	182	448	28		265	
Do. VII	143,111	94	28	62	4		36	
Do. VIII	1,946,966	1,273	414	770	89		736	
Punjab	12,390,123	10,000	2,671	6,062	1,267	10,842,456	3,872	
LIVELIHOOD CLASS I	4,802,193	3,875	1,024	2,214	637		991	
Do. II	1,993,890	1,609	418	982	209		1,044	
Do. III	959,753	775	228	453	94		285	
Do. IV	264,853	214	63	129	22		112	
Do. V	911,564	736	198	462	76		597	
Do. VI	1,133,346	915	218	633	64		220	
Do. VII	128,789	104	31	67	6		51	
Do. VIII	2,195,735	1,772	491	1,122	159		572	

Active and Semi-active Workers at the 1931 and 1951 Census—contd.

Population			Active and Semi-active Workers					
Census			1951 Census			1931 Census		
10,000 of General Population								
Earners	Working dependents	Total Un-classified population (Non-working dependents)	Self supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,355	1,251	5,394	11,229,113	1,276,878	4,364,241	9,098,240	1,005,889	3,392,044
699	124		4,741,716	121,511	1,690,857	1,894,815	91,874	335,227
856	353		2,145,995	141,046	537,837	2,321,871	256,761	956,192
308	608		619,331	137,046	701,786	833,818	93,956	1,649,999
81	4		194,648	73,176	64,717	218,541	94,093	10,155
519	96		927,587	347,596	591,146	1,408,634	190,407	260,813
226	14		766,867	107,980	156,348	614,175	82,131	37,652
49	1		162,706	24,048	27,911	131,821	17,916	4,055
617	51		1,670,263	324,475	593,639	1,674,565	178,751	1,37,951
8,746	1,532	4,722	5,665,469	854,785	2,045,936	4,204,710	441,565	1,720,553
239	..		2,511,042	83,544	796,422	268,440	14,617	..
1,549	..		1,463,298	104,023	284,018	1,738,454	157,490	..
373	1,366		203,997	93,919	336,200	418,772	42,846	1,534,059
56	..		77,977	142,714	24,960	62,727	9,346	..
548	110		455,461	261,842	324,887	614,880	98,818	124,043
253	12		277,969	63,671	45,244	283,640	39,690	13,579
35	1		43,109	13,698	9,333	39,089	6,461	760
693	43		632,616	191,374	224,872	778,708	72,297	48,112
2,933	919	6,128	3,310,828	249,961	1,568,563	3,203,269	356,191	996,403
934	57		1,269,731	22,355	510,985	1,012,533	26,723	61,254
376	668		518,786	23,826	202,208	408,022	68,998	724,755
258	27		282,004	19,810	263,267	280,209	36,261	29,251
103	9		77,998	18,286	33,513	112,392	61,073	9,179
512	85		245,222	43,768	159,905	555,068	57,026	92,510
203	17		269,870	26,395	87,426	220,101	28,309	18,281
49	2		38,569	5,455	10,522	53,149	8,380	2,704
518	54		608,648	90,066	300,737	561,795	69,421	58,469

ANNEXURE

Classification of Population by Livelihood Classes and

		1951 Census					1931	
		Number per 10,000 of General Population				Number per		
Zone/ State Livelihood Classes	Total number	Total classified Population	Self- supporting Persons	Non- earning dependents	Earning dependents	Total number	Total classified population	
1	2	3	4	5	6	7	8	
Classification of								
Patiala and East Punjab States Union								
	3,493,685	10,000	2,990	6,102	908	2,911,826	4,110	
LIVELIHOOD CLASS I	1,689,126	4,835	1,440	2,807	588		1,781	
Do. II	404,877	1,159	348	696	115		535	
Do. III	358,676	1,027	312	633	82		321	
Do. IV	82,005	235	78	147	10		117	
Do. V	255,406	731	215	471	45		521	
Do. VI	267,119	764	213	530	21		162	
Do. VII	139,019	398	119	265	14		40	
Do. VIII	297,457	851	265	553	33		633	
Delhi								
	1,744,072	10,000	3,220	6,336	444	636,246	4,222	
LIVELIHOOD CLASS I	120,808	692	164	415	113		287	
Do. II	16,497	95	27	59	9		449	
Do. III	29,276	168	45	107	16		180	
Do. IV	5,605	32	12	18	2		27	
Do. V	302,097	1,732	545	1,111	76		890	
Do. VI	396,151	2,271	663	1,561	47		667	
Do. VII	95,168	546	176	355	15		246	
Do. VIII	778,470	4,464	1,588	2,710	166		1,476	
Ajmer								
	693,372	10,000	3,659	5,082	1,259	560,292	5,239	
LIVELIHOOD CLASS I	259,645	3,745	1,539	1,391	815		633	
Do. II	21,786	314	137	119	58		545	
Do. III	19,568	282	157	90	35		1,846	
Do. IV	13,906	201	77	100	24		54	
Do. V	134,038	1,933	656	1,106	171		648	
Do. VI	86,290	1,244	331	867	46		342	
Do. VII	23,089	333	91	232	10		211	
Do. VIII	135,050	1,948	671	1,177	100		960	

11

Active and Semi-active Workers at the 1931 and 1951 Census—*contd.*

Population			Active and Semi-Active Workers					
Census			1951 Census			1931 Census		
10,000 of General Population								
Earners	Working dependents	Total Un-classified Population (Non-working dependents)	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of Principal earners	Working dependents
9	10	11	12	13	14	15	16	17
3,314	796	5,890	1,044,929	59,597	317,179	964,531	117,305	231,998
1,388	393		503,105	5,600	160,253	404,218	33,131	114,529
310	225		121,476	5,398	33,760	90,141	14,474	65,450
292	29		109,117	6,303	35,918	85,093	9,183	8,507
114	3		27,357	5,998	4,468	33,087	14,080	808
443	78		75,072	12,457	49,640	128,801	17,814	22,794
148	14		74,428	6,308	8,482	42,983	8,234	4,125
38	2		41,628	1,863	4,613	11,134	1,495	463
581	52		92,746	15,670	20,045	159,074	18,894	15,322
3,785	437	5,778	561,738	19,314	77,391	240,950	10,595	27,738
287	...		28,581	1,104	13,295	18,259	181	4
116	333		4,664	908	444	7,490	1,339	21,168
157	23		7,814	287	6,334	9,962	1,824	1,438
26	1		2,071	1,786	212	1,677	1,842	39
862	28		95,137	2,929	16,045	54,851	1,505	1,760
660	7		115,706	3,781	9,100	41,996	615	456
245	1		30,783	491	1,797	15,573	570	77
1,432	44		276,982	8,028	30,164	91,142	2,719	2,796
3,697	1,542	4,761	253,677	51,448	87,405	207,104	24,353	86,426
633	...		106,739	5,446	4,901	35,463	2,653	...
545	...		9,487	4,036	1,610	30,550	4,932	...
490	1,356		10,879	10,921	49,584	27,420	3,206	75,984
54	...		5,295	2,938	567	3,046	1,523	...
529	119		45,490	9,746	14,357	29,611	3,966	6,690
329	13		22,953	4,661	3,300	18,453	2,654	734
210	1		6,316	1,493	592	11,774	603	35
907	53		46,518	12,207	12,494	50,787	4,816	2,977

ANNEXURE
Classification of Population by Livelihood

		1951 Census					1931	
		Number per 10,000 of General Population				Number per		
Zona/State Livelihood Classes	Total number	Total classified population	Self- supporting persons	Non- earning dependents	Earning dependents	Total number	Total classified population	
1	2	3	4	5	6	7	8	
Himachal Pradesh and Bilaspur	1,109,466	10,000	3,539	4,048	2,413	943,140	6,432	
LIVELIHOOD CLASS I .	926,805	8,354	2,907	3,294	2,153		3,344	
Do. II .	79,487	716	255	295	166		2,036	
Do. III .	11,084	100	50	35	15		139	
Do. IV .	11,260	102	36	54	12		61	
Do. V .	28,944	260	101	126	33		408	
Do. VI .	18,059	162	53	97	12		79	
Do. VII .	4,336	40	22	15	3		12	
Do. VIII .	29,491	266	115	132	19		353	

II Classes and Active and Semi-active Workers at the 1931 and 1951 Census—*contd.*

Population			Active and Semi-Active Workers					
Census			1951 Census			1931 Census		
10,000 of General Population								
Earners	Working dependents	Total Un-classified population (Non-working dependents)	Self-supporting persons	Secondary of Self-supporting persons	Secondary of earning dependents	Principal earners	Subsidiary of principal earners	Working dependents
9	10	11	12	13	14	15	16	17
2,943	3,489	3,568	392,472	41,773	267,767	277,676	55,880	328,932
1,653	1,691		322,518	3,462	205,001	155,902	14,569	159,440
501	1,535		28,284	2,855	15,797	47,214	9,528	144,819
130	9		5,520	5,806	10,483	12,362	636	760
60	1		3,950	1,454	997	5,612	6,229	129
270	138		11,205	16,854	26,312	25,423	11,278	13,016
73	6		5,941	3,164	2,796	7,002	2,629	477
12	...		2,301	1,048	1,054	1,102	407	16
244	109		12,753	7,130	5,327	25,059	10,604	10,275

PART D

Note on Data Relating to Cotton Textiles

1. The cotton textiles industry is one of the most important industries in the country and there is considerable public interest in handloom weavers. In 1941, the Government of India appointed a Committee to investigate certain facts relating to handloom and mill industries. The State Governments furnished data, to the Committee, on handloom weavers.

The 1951 Census has also furnished figures regarding the number of self-supporting persons whose principal means of livelihood, is the manufacture of cotton textiles. A comparison between these two sets of data brings to light certain discrepancies which, at first sight, seem very large. In reality they compare rather well in the limited field within which comparison is possible, but there is a field where comparison is not possible. It is necessary that this fact should be explained in order that users of census statistics may not be misled. Hence this note.

2. The figures furnished in the 1951 Census are limited to 'self-supporting persons', that is to say, they consist only of those persons (a) who are engaged in the manufacture of cotton textiles; (b) who are not dependent on others for their maintenance either wholly or in part; and (c) for whom the manufacture of cotton textiles is either the sole source of income or the most important source of income. None is included who does not satisfy all three tests. The following persons are excluded: (a) Those 'self-supporting persons' who obtain their secondary means of livelihood from the manufacture of cotton textiles but obtain their principal income from some other source; and (b) 'earning dependents' who earn a part of their maintenance by participation in the manufacture of cotton textiles (these would include the unpaid family helpers of handloom weavers). The number of these two types of people who perform auxiliary but, nonetheless, useful role in handloom weaving was indeed ascertainable; but it has not been ascertained since the extent of tabulation of data relating to Secondary means of livelihood had to be restricted, with reference to considerations of time and money.

3. While 1951 Census figures are thus limited to the 'self-supporting persons'—definite information of a type hithertofore not available has been provided. The numbers in every state (and district) are analysed separately for urban and rural areas and also separated into (i) employees, (ii) self-employed workers other than employers, and (iii) employers. There were 20.6 lakhs of self-supporting persons in cotton textiles according to the 1951 Census of whom 18.3 lakhs were males and 2.3 lakhs were females. 8.7 lakhs lived in villages and 11.9 lakhs lived in towns; 9.8 lakhs were employees, 10.2 lakhs were self-employed workers other than employers, and 0.6 lakhs were employers.

4. Full-time weavers (India) :

The Fact Finding Committee have furnished data separately for full-time weavers, part-time weavers, paid assistants, and unpaid assistants. We shall refer to all weavers other than full-time weavers as 'auxiliary weavers'. It is reasonable to assume that 'full-time weavers' of the Fact Finding Committee's Report are comparable with the 'self-supporting persons' of the 1951 Census. The latter include—under cotton textile industries—not only handloom weavers but also workers in cotton textile factories. There are, however, officially published data based on factory returns which specify the numbers of the latter *separately*. If we deduct the number of factory workers as thus specified from the number of self-supporting persons of 1951 Census, we can get a dimensional picture of full-time handloom weavers. According to the 1951 Census, as already stated, there were 20.6 lakhs of self-supporting persons in cotton textiles. The number of factory and mill workers according to official statistics (relating to January, 1953) is 7.8 lakhs. This figure falls short (as it should) of the number of 'employees' ascertained at the 1951 Census. If we deduct these 7.8 lakhs, we are left with a balance of 12.8 lakhs which may be assumed to be the figure of full-time handloom weavers according to the 1951 Census. The total number of full-time weavers in India according to the Fact

Finding Committee's report in 1951 was 13 lakhs.* Though the figures are thus very close, there is one complication. The latter figure of 13 lakhs relates to *all handloom workers* and not only to cotton looms and according to the Fact Finding Committee, cotton handlooms were 72 per cent of all looms. The proportion, however, differed between States and it is impossible to say what deduction—in terms of men—should be made. All that we can say is that we have got one figure for 1941 which shows that full time weavers (inclusive of textiles other

than cotton textiles) numbered 13 lakhs. We have another figure for 1951 which shows that full-time weavers (limited to cotton textiles) numbered 12.8 lakhs. The latter figure is not inconsistent with the earlier one.

5. Full-time Weavers (Zones and States) :

The table below gives for zones and major states the number of full-time weavers given in the Fact Finding Committee's Report and the number according to the 1951 Census :

TABLE

(Figures in Thousands)

Zone/State	Full-time weavers according to Fact Finding Committee's Report	Self-supporting persons according to 1951 Census	Factory returns	Full-time weavers according to 1951 Census
I	2	3	4	5
Total Zones	1,200	2,062	783	1,279
Estimate for the area for which figures were not available	100	...	...	...
INDIA	1,300	2,062	783	1,279
North India	182	267	51	216
Uttar Pradesh	182	267	51	216
East India	176	159	40	119
Bihar	83	30	1	29
Orissa	30	38	5	33
West Bengal	61	77	34	43
Assam	3	7	...	7
South India	425	572	122	450
Madras	370	501	100	401
Mysore	34	37	18	19
Travancore-Cochin	21	34	5	29
West India	121	603	443	160
Bombay	121	564	432	132
Central India	152	309	91	218
Madhya Pradesh	54	110	32	78
Madhya Bharat	5	69	44	25
Hyderabad	93	124	12	112
North-West India	144	151	37	114
Punjab	144	42	5	37
Rajasthan	...	77	7	70

*Total number of full-time weavers according to Table XI at page 35 of the Fact Finding Committee's Report..... 14'34 lakhs
Deduct for territories in West Punjab on the basis of the proportion of 1981 Census Principal Earners under Cotton Textiles in the districts now in Pakistan to the total in all districts..... 1'45 lakhs
Deduct for territories in East Bengal on similar basis..... 0.90 lakhs
TOTAL 11.99 or 12'00 lakhs
Estimated number of full-time weavers for rest of India (Estimate of the Committee for full time and part time weavers was 1.75 lakhs)..... 1.00 lakhs
GRAND TOTAL 13'00

The table shows that except for a few individual States the two figures are comparable on the Zonal and State level. It should be observed again that one figure relates to 1941 and is inclusive of all textiles ; and the other relates to 1951 and is limited to cotton textiles.

6. Auxiliary weavers—(i) FACT FINDING COMMITTEE'S REPORT :

According to data furnished by the State Governments to the Fact Finding Committee, there were nearly 41 lakhs of auxiliary workers. This takes into account all handlooms and on the proportional basis, the auxiliary workers cotton textiles would be of the order of 30 lakhs.

(ii) 1951 CENSUS (a).—There is no figure based on the 1951 Census for the reasons already stated—tabulation of data regarding secondary means of livelihood was limited. We have, however, figures for Secondary means of livelihood relating to the entire field of production (other than cultivation). There were 42.8 lakhs of Earning Dependents including unpaid family helpers. There were also 31.4 lakhs of self-supporting persons, with some other principal means of livelihood who also derived a secondary means of livelihood in this manner. There were, thus, 74 lakhs of persons (47 lakhs of males and 27 lakhs of females) in India under 'Production, other than cultivation'. Since we do not know how many of these are engaged in cotton textiles manufacture, we cannot comment on the compatibility of the 1951 Census data with those of the Fact Finding Committee's Report. But we can say that the overall total of the people whose secondary means of livelihood is classified as 'Production other than cultivation' is sufficiently large to allow of 30 lakhs—the figure mentioned by the Fact Finding Committee—being correct.

(b) Should it be deemed essential that this number should be cleared up, it is possible to extract the 1951 Census data specially from the National Register of Citizens. There is a separate part of this register written up for every village and ward of a town or city in the country. The papers are preserved in the custody of district officers or other local officers of the State Governments. There is a record in the register in respect of every citizen enumerated in the 1951 Census whether he/she is a self-supporting person, an

earning dependent or a non-earning dependent and complete details for his/her principal means of livelihood and secondary means of livelihood are also given. From this information, numbers of persons, whose Secondary means of livelihood is Cotton Textiles can be ascertained.

(iii) 1931 CENSUS.—According to the 1931 Census there were nearly 10.3 lakhs of persons who could be classified as auxiliary weavers. They are only about a third of the number reported by the Fact Finding Committee. The Committee was not altogether sure about its own number so it may have been over-pitched. On the other hand there may have been a real increase since 1931. Comparison with 1931 cannot be pursued much further than that.

(iv) Census of Small Scale Industries.—At the instance of the late Mr. YEATTS, the State Governments undertook a census of 'Small-Scale Industries'. This census was intended to cover industrial establishments not covered by the factory returns, e.g., establishments—(a) without power employing less than 20 persons ; and (b) with power employing less than 10 persons. As the staff employed at the census was not given thorough training as in the population census, it seemed doubtful whether a complete cover was achieved in all States. There was also a special difficulty in that the prescribed definition was exclusive of factory enterprises at one end and one-man enterprises at the other end ; and it was difficult to make sure how this definition worked and to what extent one-man enterprises got included or excluded. For these reasons, the results were not tabulated or published on an all-India basis ;—but some State Governments are including this data in the District Census Hand Books. On a reference being made to the results of this enquiry, it is ascertained that the number of persons who could be classified as auxiliary weavers was nearly 20 lakhs. As far as it goes, this figure tends to show that the true number of auxiliary weavers is likely to be closer to the Fact Finding Committee's report than that of the 1931 Census.

(v) Distinction between 'dependents' of weavers and 'auxiliary weavers' :

Not all 'auxiliary weavers' are dependants belonging to the families of full-time weavers. At the same time not all members of the families of fulltime weavers (and therefore supported by income earned through handloom weaving)

are auxiliary weavers. If it should be thought necessary to ascertain the 1951 number of auxiliary weavers [in the manner described as possible in sub-para : (ii) (b) above] instructions should be issued for the purpose to distinguish these two concepts clearly. The entries in the National Register of Citizens are so made that it would be possible to ascertain the number of all persons who are dependent members of the households of full-time weavers, distinctly from the numbers of all persons who are auxiliary weavers.

7. We may recapitulate the main points. It should be borne in mind that the 1951 Census data are limited to 'self-supporting persons' who are engaged in the manufacture of cotton

textiles as their principal means of livelihood. When this information is combined with information about factory returns—we obtain the figures set out in the Table in para. 5. The figures are consistent with figures of full-time weavers as found by the Fact Finding Committee.

We are not on sure ground, however, when we deal with either auxiliary weavers (whether or not also dependant on full-time weavers) and dependent members of the households of weavers (whether or not also auxiliary weavers). The tabulations of the 1951 Census throw no light on these people. It is, however, possible (if deemed necessary) to make special effort and extract this information from the National Register of Citizens prepared at the 1951 Census.

APPENDIX IV
FAMINE AND PESTILENCE

APPENDIX IV

Famine and Pestilence

Part A—List of Famines and Scarcities

(i) Famines and Scarcities from 1769-70 to 1902-03

[FROM IMPERIAL GAZETTEER OF INDIA, (VOL. III), 1907]

Year	British territory	Native territory*
1769-70 . . .	F Bihar, Northern and Central Bengal† S Eastern Bengal.†	.. ..
1782-3 . . .	F Madras city and its environs S Bombay and its environs	F Haidar Ali's country S Cutch and neighbouring country
1783-4 . . .	S Bihar and adjoining British Districts in United Provinces	F Present United Provinces, Eastern Punjab, Kashmir, and Rajputana
1791-2 . . .	S Northern Madras	F Hyderabad, Southern Maratha country, Deccan, Gujarat, and Marwar
1802-3 . . .	.. ..	F Deccan and Hyderabad
1803-4 . . .	F Province of Agra	F Central India and Rajputana
1806-7 . . .	F Central Madras	.. ..
1812-3 . . .	S Part of the Provinces of Agra and Madras, and Gujarat	F Cutch, Kathiawar, and Rajputana S Baroda, and parts of Gujarat
1823-4 . . .	F Northern Madras S Gujarat and Northern Deccan	.. ..
1832-3 . . .	F Northern Madras	S Hyderabad and Southern Maratha country
1833-4 . . .	S Northern Deccan, Gujarat, and trans- Jumna districts of the Province of Agra, including Delhi and Hissar	S Rajputana, Jhansi and Central India
1837-8 . . .	F Central and trans-Jumna districts of the Province of Agra, including Delhi and Hissar	.. ..
1838-9 . . .	S Gujarat	S Cutch and Kathiawar
1844-5 . . .	S Deccan	.. ..

F=FAMINE

S=SCARCITY

*This list is incomplete. For the earlier famines in Native territory no information exists; only those which came prominently to the notice of British officers have been recorded.

†These tracts, though still (in 1907) nominally under Native rule, were at the time under British control.

(i) Famines and Scarcities from 1769-70 to 1902-03—*contd.*

<i>Year</i>	<i>British territory</i>	<i>Native territory</i>
1853-5	F Bellary District of Madras S Adjoining Districts of Madras and the Southern Deccan	S Hyderabad
1860-1	F Upper Doab of the Province of Agra; Delhi and Hissar Divisions of the Punjab	F Eastern Rajputana S Cutch
1865-6	F Orissa (also 1867) and Bihar; Bellary and Ganjam Districts of Madras S The rest of the east coast; the Southern Deccan in Bombay; Western and Central Bengal	S Mysore and Hyderabad
1868-70	F Ajmer; trans-Jumna Districts of the Province of Agra; Delhi and Hissar Divisions of the Punjab S Adjacent parts of the Province of Agra and the Punjab; Gujarat; Northern Deccan; Northern and South-eastern Districts of the Central Provinces	F Rajputana S Cutch
1873-4	F Bihar S Adjacent strip of the United Provinces and Bundelkhand	.. ..
1876-7	F Madras and Bombay	F Mysore and Hyderabad
1877-8	F Madras, Bombay and United Provinces S Punjab	F Mysore and Hyderabad S Kashmir
1883-4	S Hissar and Rohtak Districts of the Punjab	.. ..
1884-5	S Lower Bengal; Bellary and Anantapur Districts of Madras	.. ..
1888-9	F Ganjam District of Madras S Northern Bihar & Orissa	F Orissa Tributary States
1890-2	S Kumaun and Garhwal; Ajmer	S Parts of Rajputana
1891-2	S Bihar; the Central and Carnatic Districts of Madras; the Southern Deccan in Bombay; Upper Burma	.. ..
1896-7	F Madras (Circars and Deccan); Bombay Deccan; Bengal; United Provinces; Part of the Delhi Division of the Punjab; the Central Provinces, Berar S Rest of the Delhi Division, and Ferozepore and Gujrat Districts of the Punjab; Upper Burma	F Northern and Eastern Rajputana; parts of Central India, and Hyderabad

F=FAMINE :

S=SCARCITY

(i) Famines and Scarcities from 1769-70 to 1902-03—*contd.*

Year	British territory	Native territory
1899-1900 . . .	F Bombay; Central Provinces; Berar; Ajmer; Hissar District of the Punjab S Parts of Madras, Bengal and Agra, and Delhi Division of the Punjab	F Hyderabad, Rajputana, Central India, Baroda, Kathiawar, Cutch, and the Feudatory States of the Central Provinces, and Eastern Punjab
1900-1 . . .	F Gujarat S The Deccan and Carnatic Districts of Bombay	.. .. .
1901-2 . . .	F Gujarat S The Deccan and Carnatic Districts of Bombay; Ajmer	S Rajputana and parts of Central India
1902-3 . . .	S Parts of the Chhattisgarh and Nagpur Division of the Central Provinces	.. .. .

F=FAMINE : **S**=SCARCITY

(ii) List of Famines and Scarcities from 1903-04 to 1946-47

[BASED ON DATA COLLECTED BY STATE CENSUS SUPERINTENDENTS]

Year	Districts in Brown and Yellow Belts (Rainfall)*	Other districts
(a) Famines		
1903-04 . . .	.. .. .	Surat district of Bombay
1904-05 . . .	Banaskantha district of Bombay	.. .. .
1906-07 . . .	.. .. .	Darbhanga district of Bihar
1907-08 . . .	Bijapur district of Bombay	Panch Mahals district of Bombay; all districts of Vindhya Pradesh; and Burdwan district of West Bengal
1908-09 . . .	.. .. .	Ranchi district of Bihar
1911-12 . . .	Ahmedabad, Banaskantha and Sabar-kantha districts of Bombay	Panch Mahals and Baroda districts of Bombay
1913-14 . . .	Gird, Bhind, <i>Tawarghat</i> , Sheopur and <i>Narwar</i> districts of Madhya Bharat	Surat district of Bombay; and all districts of Vindhya Pradesh
1915-16 . . .	Banaskantha district of Bombay	.. .. .
1917-18 . . .	.. .. .	All districts of Vindhya Pradesh
1918-19 . . .	Ahmednagar, Ahmedabad and Amreli districts of Bombay; Gird, Bhind, <i>Tawarghat</i> , Sheopur, <i>Narwar</i> , Bhilsa and <i>Isagarh</i> districts of Madhya Bharat	Baroda district of Bombay; Santhal Parganas and Bhagalpur districts of Bihar

***Brown Belt** : Areas of average annual rainfall between 15 and 30 inches.
Yellow Belt : Areas of average annual rainfall below 15 inches.

(ii) Famines and Scarcities from 1903-04 to 1946-47—*concl.*

Year	<i>Districts in Brown and Yellow Belts (Rainfall)</i>	<i>Other districts</i>
(a) Famines—concl.		
1919-20	Satara district of Bombay	.. .. .
1920-21	Ahmednagar, Bijapur and Belgaum districts of Bombay	All districts of Vindhya Pradesh
1921-22	Satara district of Bombay	.. .. .
1923-24	Banaskantha district of Bombay	.. .. .
1924-25	Satara district of Bombay	.. .. .
1928-29 . . . .	.. .. .	Bankura district of West Bengal
1931-32	Bellary district of Madras	.. .. .
1934-35	Bellary and Anantapur districts of Madras	.. .. .
1935-36	Belgaum, Banaskantha and Kolhapur districts of Bombay	.. .. .
1937-38	Banaskantha district of Bombay; Bellary, Kurnool and Anantapur districts of Madras	.. .. .
1938-39	Hissar, Rohtak and Gurgaon districts of Punjab	.. .. .
1939-40	Coimbatore district of Madras; Hissar, Rohtak and Gurgaon districts of Punjab	.. .. .
1940-41	Sholapur, Belgaum, Banaskantha, and Kolhapur districts of Bombay; and Hissar district of Punjab	.. .. .
1941-42	Hissar district of Punjab	.. .. .
1942-43	Bijapur district of Bombay; Bellary, Kurnool and Anantapur districts of Madras	All districts of Vindhya Pradesh
1943-44 . . . .	.. .. .	Birbhum, Nadia, Murshidabad and Cooch-Bihar districts of West Bengal
1944-45	Belgaum and Kolhapur districts of Bombay	.. .. .
1945-46	Bellary and Anantapur districts of Madras	.. .. .
(b) Scarcities		
1903-04	Ahmedabad district of Bombay; Bellary and Coimbatore districts of Madras	Baroda district of Bombay; and Chingleput district of Madras
1904-05	Bellary and Coimbatore districts of Madras	Chingleput district of Madras
1905-06	Nasik, Ahmednagar, Poona, Sholapur, Bijapur, Belgaum, Dharwar and Ahmedabad districts of Bombay; Bellary and Coimbatore districts of Madras	Chingleput district of Madras

(ii) Famines and Scarcities from 1903-04 to 1946-47—*contd.*

<i>Year</i>	<i>Districts in Brown and Yellow Belts (Rainfall)</i>	<i>Other districts</i>
(b) Scarcities—<i>contd.</i>		
1906-07 .	Bellary and Coimbatore districts of Madras	Saran, Bhagalpur, Saharsa, Gaya, Champaran, Muzaffarpur, Monghyr, Patna, and Shahabad districts of Bihar; and Chingleput district of Madras
1907-08 . .	Nasik, Poona, Sholapur, West Khandesh districts of Bombay; Bellary and Coimbatore districts of Madras; and all districts of Madhya Bharat	Nagar and Baroda districts of Bombay; Bankura and Nadia districts of West Bengal; and Chingleput district of Madras
1908-09 . .	.. ..	Darbhangha, Chhota Nagpur (all districts in the Plateau), and Saran district of Bihar; and Nadia district of West Bengal
1909-10 . .	Ahmedabad district of Bombay	Bankura district of West Bengal
1910-11 . .	.. ..	Bankura and Murshidabad districts of West Bengal
1911-12 . .	Nasik, Ahmednagar, Poona, Sholapur, Bijapur, Belgaum, Dharwar, West Khandesh and Kaira districts of Bombay	Broach district of Bombay; and Bankura district of West Bengal
1912-13 . .	Ahmednagar, Poona, Sholapur, Bijapur, West Khandesh, and Satara districts of Bombay; and <i>Amjhera</i> district of Madhya Bharat	.. ..
1913-14 . .	Poona, Sholapur, Bijapur and Satara districts of Bombay; and <i>Amjhera</i> district of Madhya Bharat	Bankura district of West Bengal; and all districts of Vindhya Pradesh
1914-15 . .	.. ..	Hazaribagh, Palamau and Santhal Parganas districts of Bihar
1915-16 . .	Dharwar and Ahmedabad districts of Bombay	Panch Mahals and Kanara districts of Bombay; and Bankura district of West Bengal
1917-18 . .	Bijapur and Dharwar districts of Bombay	Panch Mahals, Dangs and Baroda districts of Bombay
1918-19 . .	Nasik, Poona, Sholapur, Bijapur, Belgaum, West Khandesh, East Khandesh and Kaira districts of Bombay	Panch Mahals, Broach and Satara districts of Bombay; Krishna district of Madras; and all districts of Vindhya Pradesh
1919-20 . .	Poona, West Khandesh and East Khandesh districts of Bombay	Broach and Baroda districts of Bombay; Burdwan and Murshidabad districts of West Bengal
1920-21 . .	Nasik, Poona and Sholapur districts of Bombay; Bellary, Kurnool and Anantapur districts of Madras	Panch Mahals, Broach and Satara districts of Bombay

(ii) Famines and Scarcities from 1903-04 to 1946-47—concl'd.

Year	<i>Districts in Brown and Yellow Belts (Rainfall)</i>	<i>Other districts</i>
(b) Scarcities—concl'd.		
1921-22 . . .	Sholapur district of Bombay	Dangs and Broach districts of Bombay
1923-24 . . .	Bijapur district of Bombay	.. .. .
1924-25 . . .	Bellary and Anantapur districts of Madras	.. .. .
1925-26 . . .	Sholapur and Bijapur districts of Bombay; <i>Amjhera</i> , Bhind, Sheopur, <i>Narwar</i> , Mandasaur, and Shajapur districts of Madhya Bharat	.. .. .
1927-28 . . .	Kaira, Ahmedabad, Satara and Sabarkantha districts of Bombay	Panch Mahals district of Bombay; Bankura and Nadia districts of West Bengal
1928-29 . . .	Gird, Bhind, <i>Tawalgar</i> , Sheopur and <i>Narwar</i> districts of Madhya Bharat	All districts of Vindhya Pradesh
1929-30 . . .	Gird, Malwa <i>Prant</i> , Gwalior <i>Prant</i> districts of Madhya Bharat	Baroda district of Bombay
1931-32 . . .	.. .. .	All districts of Vindhya Pradesh
1932-33 . . .	Dharwar and Satara districts of Bombay; and Hissar district of Punjab	Bankura district of West Bengal
1933-34 . . .	Satara district of Bombay	.. .. .
1936-37 . . .	Ahmednagar, Poona, Sholapur, Bijapur districts of Bombay; Gird, Sheopur, Bhilsa, Goona <i>Prant</i> , <i>Sardarpur</i> districts of Madhya Bharat; and Hissar district of Punjab	Panch Mahals, Broach and Kolhapur districts of Bombay; and Bankura districts of West Bengal
1937-38 . . .	Ahmednagar, Poona, Sholapur, Bijapur and Ahmedabad districts of Bombay	Panch Mahals, Kolaba district of Bombay; and Bankura district of West Bengal
1939-40 . . .	Sholapur and Ahmedabad districts of Bombay	.. .. .
1940-41 . . .	.. .. .	Burdwan, Birbhum and Bankura districts of West Bengal
1941-42 . . .	Ahmednagar, Sholapur, Bijapur, Belgaum, Dharwar and Satara districts of Bombay; Shajapur, Gwalior <i>Prant</i> , <i>Sardarpur</i> and <i>Pargana Susmer</i> districts of Madhya Bharat	Panch Mahals district of Bombay
1943-44 . . .	Ahmednagar, Poona, Sholapur, Belgaum, and Dharwar districts of Bombay	Surat district of Bombay and Malda district of West Bengal
1944-45 . . .	.. .. .	Bankura district of West Bengal
1945-46 . . .	Poona, Sholapur, Bijapur, Belgaum, Dharwar, Ahmedabad and Satara districts of Bombay	.. .. .
1946-47 . . .	.. .. .	Murshidabad district of West Bengal

Part B — Old Famines

(i) Extracts from the Report of the Indian Famine Commission—1880

THE NUMBER OF FAMINES AND THE INTERVALS BETWEEN THEM

The first lesson taught by this review is that (except in Burma and the most eastern parts of Bengal, where the rain has never been known to fail, and Sind, in which the population is wholly dependent on river-irrigation) hardly any part of our Indian Empire has escaped the visitation of severe famine during the last century, and that over considerable portions acute distress has recurred frequently. Taking all the 21 famines and scarcities recorded in the last 109 years in any part of India, the proportion is 24 years of bad seasons to 85 years of good, or about two bad to seven good; in each case on an average one-twelfth of the population of the whole country, that is about 20 millions, may be approximately taken as the portion affected, so that the result might be said to be equivalent to a famine or scarcity over the whole country once in 54 years. Of these calamities, 8 may be classed as intense famines, 9 as famines, and 4 as severe scarcities.

Omitting severe scarcities, there have been 17 famines, affecting 20 years, and occurring at an average interval of 5 years.

There have been eight greater famines, affecting 11 years, and occurring at intervals which have varied from 2 or 3 to 40 years, and which average 12 years. Of these, five have occurred in the present century, and have affected 202 millions of people, so that each on an average has been felt by 40 millions, or one-sixth of the population of India.

LIABILITY OF DIFFERENT PROVINCES TO DROUGHT

The liability of the several provinces to severe drought appears to be as follows. In Bengal during the 110 years over which our records extend, four droughts only have occurred, of which two were very severe. Previous to the Orissa Famine, Bengal had enjoyed complete immunity from famine for 81 years, and on this occasion, as well as in 1783-4, only the western parts of the province were affected. In the North-West Provinces nine droughts are recorded, of which two were intense and three very serious. The two greatest famines in this part of the

country, those of 1783 and 1837-8, were separated by an interval of 53 years, but there was a frequent and highly irregular occurrence of less important droughts. In Bombay nine seasons of drought appear, of which two were extreme. In Madras there were eight such seasons, of which two were excessive. Excluding Bengal, the average interval between the several recorded droughts, great and small, in any one province, is about 11 to 12 years, and between those of the severest type about 50 years, but the deviations from these averages are very large, and the records are not sufficiently accurate to give more than approximate results.

These conclusions may be otherwise summed up by stating that the Government of India must be prepared for the occurrence of scarcity, in some degree of severity and in some part of the country, as often as two years out of every nine; and that great famines may be anticipated at average intervals of 12 years. The danger of extreme famines in any one province or locality arises on the average not oftener than once in 50 years; though drought followed by severe distress must be expected as often as once in 11 or 12 years. The records are not of a nature to enable us to form any decided opinion whether droughts have recurred more frequently of late years than formerly; but, bearing in mind the far greater attention paid to these visitations recently, our general conclusion is adverse to such a supposition.

* * * * *

PROBABLE GREATEST AREA OF FAMINE AND EXTENT OF RELIEF

It is manifestly important to form the best possible estimate of the greatest area and largest population likely to be visited by famine at any one time. The experience of the past shows that seasons of drought do not occur simultaneously in Southern and Northern India, though some tendency is shown for a bad year in the north immediately to follow a bad year in the south. No deficiency at once so serious and so widespread in its effects as that which from 1876 to 1878 was experienced in various parts of the country had previously occurred in the century. The total area which suffered from famine in Southern India during 1877 was about 200,000

square miles, with a population of 36 millions. In the next year an area of 52,000 square miles in the North-West Provinces and the Punjab, with a population of 22 millions, was afflicted by a failure of the rains, though it suffered to a far less degree. Distinguishing the three degrees of famine as intense, severe, and slight, the famine in Southern India was intense in an area of 105,000 square miles, inhabited by a population of 19 millions; it was severe in an area of 66,000 square miles, with a population of 11 millions; and it was slight in an area of 34,000 square miles, with a population of 6 millions. Where the distress was but slight the necessity for giving relief arose only in isolated localities and the administration of famine relief on such a scale as to need special measures was in practice confined to the tracts where the famine was intense or severe. Relief was afforded to 780,000 persons or 5 per cent. of the population of the more afflicted area in Madras for 22 consecutive months, and in Bombay to 320,000 persons, or 3½ per cent., for 13 months. The maximum number relieved during the worst month was about 500,000 daily in Bombay and 2¼ million in Madras, or from 6 to 15 per cent. of the population severely affected.

In Bengal, in 1873-4, the area severely affected was 21,000 square miles, and the population of that area was 10 millions; of that population about 10 per cent., received direct relief for an average period of 9 months, and the highest number in receipt of direct relief at any one time was about 20 per cent., or 2 millions daily.

The famine of 1868-9 is the one which came nearest to that of 1876-8 in severity; indeed, it surpassed that calamity in extent, for it covered the space of 300,000 square miles. It was intense over an area of 113,000 square miles, but of these 110,000 square miles were in the Native States of Rajputana, and were thinly inhabited, the population of this tract being only 7¼ millions. The famine was severe over 112,000 square miles (only half of which was in British territory), and among a population of 21 millions, two-thirds of whom were British subjects. The famine of 1865-6 ranks third in respect of the area it covered, and the population it affected was even larger than that in 1868-9, or in the Southern Peninsula in 1876-8, but the distress it caused was not nearly so grievous. The area of intensity was the Province of Orissa and the

neighbouring districts to north and south, a tract which contained only 31,000 square miles with a population of 6 millions, and the famine was severe in 50,000 square miles more, with 11½ million inhabitants. In the rest of the country afflicted by it the distress was slight, and little or no relief was called for. Hence, in spite of the wide area of the drought, this famine was less generally disastrous than either of the two great calamities which succeeded it.

Looking then to those parts of the country in which there have been the worst famines and the greatest distress, we find in the history of the past no case which has surpassed the famine of 1876-8 in intensity, and it seems reasonable to conclude that it is not likely to be exceeded in the future, either in the extent of British territory affected or in the degree of relief that will be required. On this presumption it may be estimated that the largest population likely to be severely affected by famine at one time may be put at 30 millions. To arrive at the numbers likely to come on relief, we may safely take a proportion slightly lower than that of the Bihar famine, say 15 per cent., or four and a half millions, as the maximum number likely to be in receipt of relief in the worst months, and about 7 or 8 per cent., or from two to two and a half millions, as the average number likely to require relief continuously for the space of a year. These proportions provide for relief on a scale about double that actually given in Madras and Bombay in 1876-78.

THE CLASSES THAT SUFFER FROM FAMINE

The first effect of drought is to diminish greatly, and at last to stop, all field labour, and to throw out of employment the great mass of people who live on the wages of such labour. A similar effect is produced next upon the artisans, the small shopkeepers, and traders, first in villages and country towns, and later on in the larger towns also, by depriving them of their profits, which are mainly dependent on dealings with the least wealthy classes; and lastly, all classes become less able to give charitable help to public beggars, and to support their dependents. Such of the agricultural classes as possess a proprietary interest in the land, or a valuable right of occupancy in it, do not as a rule require to be protected against starvation in time of famine unless

the calamity is unusually severe and prolonged, as they generally are provided with stocks of food or money, or have credit with money-lenders. But those who, owning only a small plot of land, eke out by its profits their wages as labourers, and rack-rented tenants-at-will living almost from hand to mouth, are only a little way removed from the class of field labourers; they possess no credit, and on them pressure soon begins. Thus the classes who are the earliest in point of time to feel the need of relief are (1) the actually landless class who live on the wages of labour, and the smallest proprietors or occupiers; (2) artisans and small traders; (3) infirm persons and beggars who ordinarily live on the charity of the public or of individuals; and (4) the dependents of all persons who by reason of their own distress can no longer support them. These classes again fall into two chief categories: (1) Those who are accustomed and able to perform work of some sort; and (2) those who from any cause are incapable of labour.

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MORTALITY DURING THE FAMINE OF 1876-8 AND IN THE LAST 30 YEARS

It has been estimated, and in our opinion on substantial grounds, that the mortality that occurred in the provinces under British Administration during the period of famine and drought extending over the years 1877 and 1878 amounted, on a population of 190 millions, to $5\frac{1}{4}$ millions in excess of the deaths that would have occurred had the seasons been ordinarily healthy; and the statistical returns have made certain, what has long been suspected, that starvation and distress greatly check the fecundity of the population. It is probable that from this cause the number of births during the same period has been lessened by two millions; the total reduction of the population would thus amount to about seven millions. Assuming the ordinary annual death-roll, taken at the rate of 35 per mille on 190 millions of people, to be $6\frac{1}{2}$ millions the abnormal mortality of the famine period may be regarded as having increased this total by about 40 per cent.

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RECUPERATIVE POWER OF THE COUNTRY

But great as is the loss of life which has attended these terrible visitations, we are not without hope

that their effects will in future be gradually diminished in intensity, partly by the more efficient character of the relief given, partly by the extension of the means of communication and development of internal trade, and partly by that greater preparedness of the people to meet them which grows from the increase of thrift and resourcefulness, and the accumulation of capital due to a settled and civilised Government. It is, we believe, demonstrable that the effects produced by the famine of 1876-8 on the general prosperity of the country have been less disastrous than those of former calamities, none of which were more grievous and most of which were not to be compared to it in severity. The famine of 1770 resulted in wide-spread desolation of the most afflicted districts, so that we read of "depopulation and ruin," "the thinness of the inhabitants," "many hundreds of villages entirely depopulated," "half the ryots credibly reported to have perished" and a complete disorganisation among the landed classes which lasted for many years. The famine of 1803 struck such a blow at the prosperity of Khandesh and Ahmednagar that even in 1867 the traces of its ravages were still visible in the ruins of deserted villages which had not been repopulated. In the famine of 1833 so much land went out of cultivation in the Guntur district that even in 1850 the land revenue was only three-fourths of what it had been in 1832. In 1837, in the North-Western Provinces, "the pressure was so great that the ordinary bonds of society seemed to be broken by it. In 1841, the still deserted lands and abandoned houses" in the Etawah district bore evidence to the devastation and waste of life, and during the next five years the land revenue continued to be less by 12 per cent. than in the period preceding the famine. Col. Baird Smith testified that similar effects were hardly noticeable in 1860-1. This, he attributed to the increased power of resistance and self-support among the landowners following the introduction of long term settlements, which dated from about 1840. Still more remarkable are the facts recorded in the agricultural statistics of Bombay and Madras for the year 1877-8. In Madras the area occupied exceeded by 50,000 acres that of 1874-5, and the land revenue was eight lakhs of rupees in excess of the average demand before the famine. In Bombay there was an actual increase of 70,000 acres of revenue-paying occupied land in excess of the previous year, and the land revenue was increased by one lakh over that of 1876-7, and by $4\frac{1}{2}$ lakhs over

the average of the last 10 years. We may hope that the same recuperative power of the country will manifest itself more and more clearly in future ; and that it will, by degrees, extend from the landowning classes to all parts of the population.

(ii—*a*) Extracts from the All-India Census Report, 1891

UPTO 1891 : The next of the influences that we have to consider is that of famine, with which we have in India always to reckon. Most fortunately, the 10 years under review have been almost free from this calamity, and the one or two cases of serious failure of crops that did occur were purely local and restricted to very narrow limits, both territorially and with respect to the population affected. In fact, the only occurrence of this description worth mentioning is the scarcity that prevailed in the northern portion of the east coast of Madras, in 1889, and even here the direct effects were comparatively small. but the great famine of 1876-78 in the Deccan and South India, has impressed itself rudely on the census returns. Here, as in the case of Orissa, in 1886, and Rajputana, two years later, and again, of the North-West Provinces, in 1861, the effects will be marked out in the age-tables until the generation that suffered them has passed out of life. But, for the present, we have only to consider famine as one of the checks on the growth of the population, not in its detailed action on the latter. That check is exercised in a two fold manner, directly and indirectly. It not only increases the number of deaths, but it tends to diminish that of births otherwise than by merely destroying possible parents. As regards the first, the number of people who die from actual want of food is probably small compared to the deaths which result from the greater hold which disease gets on those who are enfeebled by diminution of their usual supply of nutriment. Thus, in times of scarcity, the mortality from ordinary causes, such as bowel complaints and intermittent fever, rises considerably above the normal rate. Since many succumb who would, in ordinary times offer a successful resistance. The second of the results just mentioned was very prominent in the age returns at the census of 1881 for the Deccan and Southern India, and reappears at the age of 10 to 14 in those of 1891.

From these data it is clear that famine is most felt in the first four or five years of life.

(ii—*b*) Extracts from the All-India Census Report, 1901

1891 TO 1901: In 1891-92 there was scarcity over a considerable area in Madras and Bombay, and in parts of Bihar. In 1895 a weak monsoon led to extensive crop-failure in the southern districts of the United Provinces, and a sudden cessation of the rains of 1896 resulted in famine in the United Provinces, the Central Provinces, and Berar, and parts of Madras, Bombay, Bengal, the Punjab, Upper Burma, Rajputana, Central India and Hyderabad. Altogether an area of about 300,000 square miles with a population of nearly 70 millions was affected and on the average, two million persons were relieved daily during the twelve months from October 1896 to September, 1897 ; the number rose to more than 4 millions at the time of greatest distress. . . .

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In 1899 the monsoon again failed, and the results were even more disastrous, for though the population affected was slightly less than in 1896-97, famine conditions prevailed over an area half as great again and with less easy means of communications, the drought was much more severe, the people had not yet recovered from the previous visitation, the mortality amongst cattle from want of fodder and water was far heavier, and the tracts which suffered most lay for the greater part in Native States where the relief organisation was necessarily less perfect than in British territory. In the height of this famine there were for weeks together over six million persons in receipt of relief, and the value of the agricultural production of the year was estimated by the Viceroy to have been 60 millions sterling below the average ; there was also a loss of some millions of cattle.

It is impossible to say with any pretence to accuracy what was the actual mortality caused by these calamities. The Commission of 1901 thought that about a million deaths were attributable to the famine of 1899-1900 in British Territory, and it would probably be safe to assume that another three millions must have occurred in the Native States, which contained more than three-fifths of the population afflicted

and where the relief operations were generally far less successful. No estimate has been made of the excess mortality in 1896-97 but it cannot have been much less than a million. The total mortality due to the two famines may therefore be taken roughly at five millions. The diminished vitality of the people resulted also in a heavy fall in the birth rate, but this was to some extent counterbalanced by an unusually high rate of reproduction when the people had recovered their normal condition.

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Berar :

After fifty years of almost unbroken prosperity Berar was visited during the ten years preceding the last census by two famines, which followed each other in close succession and reduced the population by 143,475 persons or 4.9 per cent.

Everywhere, except in the hilly tract of the Satpura range known as the Melghat taluk, the famine of 1895-97 was due rather to an inordinate rise of prices than to actual scarcity of food. It was felt most severely by the large class of field labourers for whom there was no work and by the half starved immigrants who flocked in from the Central Provinces and helped to swell the death roll. Although the death-rate of Berar rose in this year from 37.6 to 52.6 per thousand, there were few deaths from starvation among the natives of the Province, except in the Melghat. Here the failure of crops was complete ; there were no stores of grain to fall back upon ; the jungle tribes—Bhils, Korkus and Gonds—were too shy, too inert, and too unused to regular labour to come on to the relief works, and a considerable number of them admittedly died of want. The famine of 1899-1900 was a calamity of a more formidable type, brought about by the great atmospheric movements which determine the variations of the monsoons. Not only did both the autumn and spring crops fail completely ; there was also a dearth of fodder ; the stores of grain which are still habitually maintained had been exhausted in 1897 and not replenished in the following year, and, to complete the disaster, the sources of water-supply dried up and a large number of cattle perished from thirst. The death-rate rose from 40 to nearly 83 per thousand ; the birth-rate fell from 50 to 31. The number of deaths returned was 236,022, being nearly four times as many as oc-

curred in 1898. Some of these people no doubt were immigrants from the neighbouring parts of Hyderabad, but no estimate of their number can be made, and it is impossible to doubt that there was considerable mortality among the inhabitants of the Province.

The age statistics contained in Imperial Table VII show very clearly that excess mortality arising from famine, and from the diseases which accompany famine, must have played a very large part in producing the results which the census tables record. Proceeding on broad lines, so as to neutralise the characteristic defects of the statistics, we find that in 1901, the number of children under 10 in Berar was less by 154,208, or 38.2 per cent., than it was in 1891. It will also be seen that the number of persons between 50 and 60 declined by 11,703 or 14.2 per cent., while in the period "60 and over", the reduction amounted to 47,673 or 27.2 per cent. For the ages under 5 the vital statistics show that 545,127 births were registered in Berar during the five years 1896-1900. Of these children, only 287,986 were surviving in March 1901 and 257,141 or 47 per cent. had died. Bearing in mind the untrustworthy character of the data, I refrain from pursuing the comparison for individual years. The broad facts speak for themselves. Excessive mortality among the very young and a high, though less striking, death rate among the old are the inevitable consequences of famine on a large scale. Even if there are no deaths from actual starvation, the weaker members of the population are bound to succumb in large numbers to the fever, which is always present, and to the special diseases, cholera, dysentery and diarrhoea, which the abnormal conditions tend to produce. But if the Berar age tables bring out these necessary limitations of famine relief, they equally illustrate the great improvement in famine administration which we owe in the main to the Commission of 1880. The chief feature which distinguishes a modern famine, not only from the earlier famines vaguely noticed in history but also from such disasters as attacked Orissa in 1866 and Madras in 1877, is the fact that in the earlier famines starvation assailed all classes and all ages of the community. The weakest doubtless suffered most, but the strong did not escape, and the deaths among adults of both sexes were numerous enough to leave their traces on the birth-rate for years to come. A glance at the

Berar figures show how great an advance has been made on the earlier state of things. For the two sexes taken together, the reproductive ages generally show an increase, and the great decline of population is limited to the very young and the very old. The birth returns confirm this view. The people recovered rapidly from the famine of 1897 and the number of births, which fell in 1898 to 89,414 rose in the next year to 144,034, the highest figure ever recorded in Berar.

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Bombay :

In 1876-78 the whole of the Deccan and South Maratha country was severely affected by a famine which is estimated to have caused 800,000 deaths in excess of the usual number. As a consequence, in spite of better enumeration, the growth of population registered in 1881 was barely a third of a million. In the next decade the conditions were far more favourable. There was no famine, and not even a particularly bad harvest, and there were no specially severe epidemics. The population, therefore, grew rapidly and by 1891 it had risen to 26,960,421 to which British territory contributed 18,878,314 and the Native States 8,082,107. The proportional variation was 14.4 per cent. in British territory and 16.5 per cent. in the Native States, or 1 per cent. in the Presidency as a whole.

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For some years after 1891 the seasons were normal and, with the exception of occasional visitations of cholera there was no unusual mortality ; but then followed "a succession of famines, bad seasons and plague epidemics unrivalled in the recent history of any other part of India."

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The famine of 1896-97 fell most heavily on the Deccan districts and Bijapur. In the rest of the Presidency the scarcity did not amount to famine, and relief works were not necessary, but there was wide-spread suffering from the high prices which prevailed. During the next two years the crops seem to have been fair, except in the Deccan, but then came the famine of 1899-1900. This calamity, following as it did on a succession of lean years, caused even greater distress in the Deccan than its predecessor of 1896-97, but the brunt of it fell on

the well cultivated and usually fertile plains of Gujarat, "the garden of Western India," which until then had been regarded as outside the famine zone.* Sind, owing to its dependence upon irrigation, again escaped, and so did the Konkan and South Maratha Country. The area affected on this occasion was nearly twice as great as in the famine of 1876-78 and the maximum daily average number of persons relieved was three times as great. When the census was taken over 100,000 persons were still in the relief camps.

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The result of the adverse conditions of the decade is that the census of 1901 shows a decrease of a million and a half, or 5 per cent., as compared with that taken ten years previously ; the population of British territory has fallen to 18,559,561, a drop of 2 per cent., while that of the Native States is now only 6,908,648, or 14 per cent. less than in 1891. The returns of the Sanitary Department show an excess of births over deaths to the extent of 645,000 in the first six years of the decade, and of 47,000 in the first six years of the decade, and of 47,000 in the years 1898 and 1899, while in the two famine years, 1897 and 1900, there was an excess of deaths amounting to 120,000 in the former, and 813,000 in the latter year†.

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With the exception of Surat where there is a decline of only 2 per cent., all the districts in Gujarat show a serious loss of population, varying from 14 to 18 per cent. The results are equally bad for the Native States of Cutch and Kathiawar and they are even worse in the case of Baroda.

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* That is to say at the present day. The terrible famine which devastated Gujarat in 1630 was probably one of the most severe of these scourges that ever visited India.

† In the Memorandum on the Material Condition of the people of Bombay Presidency 1892-1901, it is said that plague and famine by increased mortality and reduced birth-rate caused a loss of two and a half millions in British territory and of two millions in the Bombay State.

This tract suffered comparatively little from plague and it was not seriously touched by famine until 1899-1900.

There can be but little doubt that the famine of this disastrous year, falling as it did on a population heavily in debt to the money-lenders, is the main cause of the startling loss of population disclosed by the census.

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The decrease in Belgaum is fully explained by the virulence of the plague epidemic, and in Bijapur it is probably due to losses on account of famine, especially in 1896-97, when the number of persons on the relief works was greater than in any other district. The returns of the Sanitation Department do not indicate a mortality sufficiently high to account for such a marked diminution in the population, but there can be no doubt of the severity of the famine.

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Central Provinces

The first census of the Central Provinces was taken in 1866 and disclosed a population of 9,236,983. Three years later came the famine of 1869, which touched with severity only the northern and eastern borders and caused an excess mortality estimated at about 250,000. Notwithstanding this disaster, the census of 1872 showed a small increase of 186,551 persons, the population then recorded being 9,223,534. In their fore-cast of the liability of the Province to scarcity, the Famine Commission of 1880, while admitting that the harvests as a general rule depended on the natural rainfall, went on to say that in the greater part of the country the rainfall had never been known to fail "and no part of India is freer from any apprehension of the calamity of drought than are the Central Provinces and Berar." By 1881 the population had risen to 11,548,511, or by 25.2 per cent., a considerable proportion of which may be ascribed to improved enumeration, especially in the Native States, which showed an increase of 63 per cent. The census of 1891 enumerated 12,944,805 persons, being 12.1 per cent. more than in 1881. Here again some allowance must be made for more accurate methods in the Native States, where the increase was 26.4 per cent. as compared with the more probable figure of 9.6 in British districts.

The event of the ten years preceding the last census have signally falsified the optimistic views of the First Famine Commission. A succession of bad seasons culminated in the first great famine of 1896-97, which was followed, after a single year's respite, by the widespread calamity of 1899-1900. Epidemics of cholera prevailed in seven years out of the period and malarial fever was on several occasions unusually frequent and severe. These disasters, coming upon a weakened and impoverished people, reduced their number to 11,873,029 persons, a decline of 1,071,776 or 8.3 per cent.

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For the first famine the returns of deaths are probably a good deal below the mark. In many districts the reporting officers, mostly illiterate village watchmen of the lowest castes, were greatly overworked, rural society was dis-organized by famine and cholera, and large numbers of people especially members of the wilder tribes, had left their homes and wandered away into the jungles in search of food.

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For the purpose of estimating the deaths directly and indirectly traceable to the second famine, the Famine Commission of 1901 take the decennial average of recorded deaths at 351,548 and deduct this from 539,234, the number of deaths registered in 1900. They thus arrive at 187,686 as the excess mortality of that year in British districts. If we follow their method and deduct the same decennial average from the number of deaths registered in 1896 and 1897 we get 424,195 as the excess mortality of the first famine, and 611,881 as the excess mortality of both famines in British districts alone. Adding 123,680 for Native States the abnormal mortality of the Province may be stated in round numbers at 735,000.

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If we compare for British districts the age distribution of 1891 and 1901, we find that among ten thousand of the population there were living on each of these occasions :—

	1901	1891	Variation
Persons under 10 .	2,632	3,068	—436
10 to 15 .	1,225	1,102	+123
15 to 40 .	4,102	3,745	+357
40 to 60 .	1,612	1,525	+87
60 and over .	429	560	—131

The decline in the number of children and old people reflects the characteristic inroads of disease and scarcity upon the weakest members of the community. The increase in the proportion of persons between the ages of ten and sixty is mainly a consequence of the great diminution which has taken place at the two ends of the series. It does not follow, for example, that because the proportion of persons in the reproductive period from 15 to 40 is greater by $4\frac{1}{2}$ per cent. than in 1891, there is a similar preponderance in the actual number of people capable of bearing or begetting children. And recovery of the population from the wastage caused by famine is clearly dependent upon the absolute number of possible parents and not merely on their relative strength as compared with the proportion in the earlier and later age periods.

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Madras :

The decline of population between 1871 and 1881 was due to the calamitous famine of 1876-78, and was far greater than would appear from a comparison of the census figures, which are estimated to have been deficient in 1871 to the extent of nearly 850,000.

Since 1891 the conditions in Madras have not been favourable to a rapid increase of the population. According to Mr. Francis, "Plague checked trade and enterprise and there were three scarcities—in 1891-1892, in 1897, and in 1900. The first of these was most severely felt in the Deccan districts, especially in the Cumburn and Markapur taluks of Kurnool, and in the adjoining western taluks of Nellore. The second affected the Deccan Division again, and the Ganjam, Vizagapatam and Godavari districts of the East Coast Division. The third was again worst in the Deccan (especially in Cuddapah) and the western part of Nellore, and also attacked the west part of Kistna adjoining. What the precise effect of each of these visitations was it is not easy to say. The Sanitary Commissioner concluded from the vital statistics that though no actual deaths from starvation were reported during the scarcity of 1897, the total diminution of population due to the famine conditions which then prevailed such a reduced birth-rate, increased susceptibility to ordinary disease among ill-nourished persons, and so on, was over 20,000 persons. Most of this loss was estimated to have occurred in the Deccan districts." It may be added that the above famines were less

severe in Madras than in many other parts of India. The worst was that of 1896-97, but thanks to the prompt measures of relief undertaken by the Madras Government and, in the case of the East Coast districts, to the fact that the previous four years had been years of plenty, the sufferings of the people were far less than they would otherwise have been.

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The fact that the population has increased by as much as 7.8 per cent. affords unmistakable evidence of the general well-being of the people and of their growing capacity to resist the evil effects of crop failure.

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Punjab:

There was a famine three years before the census of 1855, and another eight years before that of 1868; the census of 1881 was taken twelve years after one famine and three years after another, but between 1881 and 1891 there was no such visitation. The rapid growth of population after a famine is well known, and it is thus easy to understand why the rate of progress disclosed at the censuses of 1868 and 1891, which followed periods of recovery from famine, should have been more rapid than in the thirteen years preceding 1881 when famine twice ravaged the country.

The conditions during the last decade are comparable to those of the interval between 1868 and 1881; there were two famines in both periods, but those of the last decade followed each other with greater rapidity and there was thus less time for recuperation. The area affected by the failure of the monsoon of 1896 was very extensive, but the situation was improved by opportune rain in December, which facilitated the cold weather sowings, and there was severe famine only in a few districts in the south-east; viz., in Hissar, where it was most acute, and in those portions of the districts to the east of it, i.e., the districts round Delhi, which were not protected by the irrigation system of the Western Jumna Canal. The relief afforded was ample and, except in Hissar, the death-rate in the affected tracts was little, if at all, above the average of the previous five years. There was a sudden rise in the mortality in Hissar and several other tracts at the close of the monsoon of 1897 but the Famine Commissioners of 1898 held that

it was due mainly to fever "of the ordinary malarial type.....which always occurs when a year of heavy monsoon rainfall succeeds a year of drought." The number of deaths, however, "was increased by the enfeeblement of health which a prolonged period of privation had produced." There was also a very heavy mortality among cattle owing to the drying up of fodder supplies.

The area which was affected by the weak monsoon of 1899 was much the same as in the previous famine, and Hissar again suffered most. The death-rate of 1900 in all the famine districts was high, being more than double the decennial average, and in Hissar it rose to 96 per mille compared with an average of only 28 in the previous nine years. Cholera, dysentery and diarrhoea, the characteristic diseases of famine years, were not specially prevalent and the great bulk of the deaths were attributed to fever. The Famine Commissioners of 1901 found that "much of the mortality was due to an unusually unhealthy autumn acting upon a population predisposed to disease by privation." The general death-rate in this year was 47.7 per 1,000 which was higher than in any other year of the decade except 1892 when it was 49.5.

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Central India :

....The famine of 1877-79 intervened between the census of 1872 and that of 1881 ; the mortality from it and its attendant diseases, and from fever, was very high.

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In 1895 the monsoon ceased early in September and in the ensuing cold weather there was scarcely any rain. The autumn harvest was in consequence 20 per cent below the average and that of the following spring yield barely three-fifths of the normal outturn. The eastern districts and those in the Central India plateau, or British Bundelkhand, where the loss of successive spring harvests had weakened the staying powers of the people suffered most, and in the latter tract famine supervened. The monsoon of 1896 was even more unsatisfactory than that of 1895. Up to the third week in August the general prospects were fairly good, but the monsoon gradually became weaker, and September and October were practically rainless. The rains of the ensuing cold weather, moreover, were not sufficient

to replenish the moisture in the soil. The autumn and spring harvests were thus both very short and the two combined are estimated to have yielded barely half the normal outturn. This led to severe distress in almost all districts, while in many there was actual famine. The suffering was greatest in the Central India plateau and the Central Plain, in the south-west of the Western Plain, and in Jaunpur and Mirzapur.

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It will suffice to say that the State enjoyed a full measure of prosperity up to 1899-1900 and that the shocking depopulation which has since taken place is due entirely to the ravages of the famine of that year.

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The loss of population is greatest in the Western States *i.e.*, in the elevated tract lying along the Arravalli Satpura and Vindhya ranges. In several years the rainfall was deficient and the crops were poor. This tract did not suffer from scarcity in 1897, but in 1899, an almost complete failure of the monsoon, following close on a deficient rainfall in the previous year, brought on a very severe famine, which was accompanied, as usual, by cholera and bowel complaints and a sort of paralysis attributed to the eating of a kind of wild pulse. The mortality was very high, and resulted at the present census in a decrease of more than two-fifths in the population of the Malwa Agency, and of nearly the same proportion in that of Bhopal. In the Indore Agency nearly a third, and in Bhopawar a sixth, of the population of 1891 has disappeared. These figures, appalling as they are, have their counterpart in the adjoining States of Rajputana. The least unsatisfactory figures in this tract are those for the Indore Residency, where the decrement is only 5 per cent., an amount sufficiently large in itself, but small in comparison with the enormous losses in the neighbouring States.

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Gwalior :

....There was a severe famine in 1899-1900. The net loss of population during the decade was 13.2 per cent. It occurred mainly in the elevated country in the south-west ; in the Gwalior Prant to the north, three districts show an increase, and three a decrease of population, which, however, in no case exceeds 10 per cent.

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Hyderabad :

.... Since 1891 the State had suffered from a succession of bad seasons and in only two years was the rainfall favourable to the crops. The western districts, which adjoin the Bombay Deccan, shared in the famine of 1896-97, the distress being greatest in the south-western tract which had suffered most severely in 1876-78. The evil effects of this famine were, however, slight compared with those of its successor of 1899-1900 which was most severely felt in the north-western districts, Aurangabad, Birh, Parbhani and Naldrug or Oosmanabad.

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That this famine is chiefly to blame is shown by the fact that practically the whole of the decrement has occurred in the tract where its ravages were mainly felt, which has lost nearly a fifth of the population that it contained in 1891.

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Mysore :

In 1871 the inhabitants of Mysore numbered 5,055,402, but in 1876-78 the people were overwhelmed by a most disastrous famine known in Southern India for many years, which wrought more havoc in Mysore than anywhere else. Four successive monsoons failed to bring their normal supply of rain. The mortality was terrible, and it has been estimated that one-quarter of the population was swept away by starvation or disease. When the next census was taken in 1881, the number of inhabitants had fallen to 4,186,188, a loss of 17.2 per cent. Since then the recovery has been rapid, and an increase of 181 per cent. in 1891 has now been followed by a further gain of 12 per cent. The population now stands at 5,539,399 or more by 9.6 per cent. than it was in 1872. The rapid progress between 1881 and 1891 was the usual sequel of a bad famine, which carries off the very old and very young and leaves an exceptionally large proportion of the population at the reproductive ages.

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Rajputana :

.... Since 1891 the country has suffered from a succession of seasons of deficient or ill-distributed rainfall. In the first year of the decade severe scarcity was felt in Marwar, Bikaner and Jaisalmer, the three States lying west of the Aravalli range,

in the region of sandy desert and scanty rainfall which forms the "North-West Dry Area". In 1895 the same tract obtained barely two-thirds of its ordinary rainfall and relief operations were started in Jaisalmer. The next season was also unfavourable and famine conditions spread into Bikaner ; Marwar was affected by scarcity and there was also some distress east of the Aravallis, in Dholpur and Bharatpur, which lie in the "Indo-Gangetic plain, west". The rainfall was again deficient in 1898, while in 1899 the monsoon practically ceased towards the end of July, and the abnormal heat withered the grass and standing crops, dried up many of the irrigation tanks and wells, and brought on a famine more severe even than that of 1868-69.

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Fever epidemics broke out in 1892, 1899 and 1900, the most virulent of all being that which followed the heavy rainfall of August and September 1900, which was aided in its ravages by the impaired vitality of the people.

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However that may be, it is probable that the population at the beginning of 1899 was at least as great as in 1891, and that the whole of the decrease which has taken place is attributable to famine and disease during the two years immediately preceding the present census. It has been said that much of the loss is due to emigration, and it is well known that during the famine the relief works in the adjoining British territory were crowded with half-starved wanderers from Rajputana.

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But even so, the losses owing to famine and its sequelae must exceed two millions, or, say 17½ per cent.

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(ii-c) **Extracts from the All-India Census Report, 1911**

Orissa Coastal :

Throughout the decade the seasons were less favourable to agriculture in this division. In 1907 and 1908 there were scarcity in all three districts—it was acute in Balasore, and in Puri it culminated in famine. The opening of the Bengal Nagpur Railway has greatly encouraged emigration. The net loss from this cause is now 231,502 compared with 151,604 in 1901.

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(ii-d) Extracts from the All-India Census Report, 1921

....The monsoon of 1918 was exceptionally feeble and gave practically no rain after the beginning of September. In the Punjab and the Central and Western portions of the continent the crops failed over considerable areas and scarcity, aggravated by the high level of prices, was declared in parts of the Punjab, United Provinces, Central Provinces, Bombay Bihar and Orissa, while agricultural conditions were equally bad in parts of the Hyderabad and Mysore States..... Famine relief organisation is now so highly perfected in India that scarcity is not necessarily accompanied by high mortality..... These conditions lasted through the first half of 1919 ; an abundant though not very well distributed monsoon in that year brought some welcome relief, though prices remained high and it was necessary to stop all export of food grains and to reinforce the stocks of the country by importing wheat from Australia. The monsoon of 1920 was poor ; the autumn rains failed and the winter rains were in defect. Famine was declared in one district in Bombay and scarcity in another district of that Province and in several districts of the Central Provinces. Famine conditions in Hyderabad were pronounced and distress prevailed in certain districts of Madras.

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Bengal :

....The Bankura district suffered twice in the decade from a failure of crops.

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Central Provinces and Berar :

....The monsoon again failed in 1920. Famine or scarcity was declared over a considerable area in the provinces and agricultural conditions had not recovered when the census was taken. There was considerable temporary migration from the east of the provinces to the mining areas of Chhota Nagpur, but the Superintendent thinks that the bulk of the migrants had returned by the date of the census.....

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Madras :

There was a general failure of the south-western monsoon and a consequent contraction of the area under cultivation, the deficiency being most striking in the Deccan where dry cultivation was 78 per cent and wet cultivation 73 per cent

below the average of the previous five years. The situation was rendered worse by the delay in the north-west monsoon and cropped area fell in one year by nearly three million acres. The tracts worst affected were the East Coast (North) and the Deccan divisions and the districts of Chittor and Salem. In the Ganjam district there was severe distress over more than 1,000 square miles and the numbers in receipt of daily relief rose to over 150,000 in October, 1919.

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Punjab :

....The harvest of 1915-16 was poor and the economic and political difficulties arising from the war were beginning to be felt ; the birth-rate began to fall and the death rate to rise. Disastrous harvests in 1918-19 were accompanied by a severe outbreak of influenza and increasing economic and industrial depression, and a further failure of the harvest in 1920-21 entirely disorganized the export market and left prices to the mercy of the local demand and supply.

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Hyderabad :

....The almost complete failure of the monsoon of 1918 resulted in widespread famine and scarcity in the State.

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(ii-e) Extracts from the All-India Census Report, 1931

....There has, however, been no serious famine in the decade under review.....

....Improvements in communications, and consequently in ease of distribution, nowadays prevent anything like the famine mortality of a century ago, while taking India as a whole the decade ending in 1931 was a prosperous one in the matter of crops.....

In Bengal there were floods, it is true, and floods proved to be the principal cause of local distress and scarcity during the decade in India generally, as no province completely escaped the inundation of some portion in the ten years under review. But taking India as a whole the first five years were generally above the average, or little below it. Famines were local and not very serious, though one unfortunate district in Madras had famine declared in it officially in three seasons.....

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Part C—Plague, Cholera and Small-pox

(a) Extracts from the All-India Census Report, 1901

... it is necessary to refer to..... the check on the increase produced by the prevalence, in annually varying proportionate strength, of certain epidemic diseases. It is not easy to treat this subject otherwise than very generally, for the diagnosis of the village accountant or the local constable is very liable to error, and except in the hospitals and dispensaries, the classification of the causes of death leaves much to be desired. Small-pox and cholera, however, if, indeed we may call them epidemic in India where they are always present, are probably more correctly registered than most other fatal maladies. The symptoms are too well known and the disease, too, in both cases, is under the special control of a certain female divinity;... The rest of the ills to which Indian flesh is heir to—excepting accidents and snake-bite, mostly come on to the returns under the generic title of fever. Taking the return for what it is worth, we have had, during the past 10 years, a population under observation averaging about 197½ millions, with a mean annual number of deaths amounting to 5,140,000, which seems to indicate an omission of at least one in three. Of those registered, the 10 years' average includes about 309,000 deaths from cholera, yearly, with the maximum of 475,660; 126,750, from small-pox, the highest number being 333,388 and 3,397,300 from fever, with the corresponding limit of 4,110,000. Of the remainder, a number just short of a thousand is unclassified; and accidents and what are grouped under the head of bowel complaints account for the rest. Thus, to fever are attributed 66 per cent of the deaths, to cholera, 6; to small-pox 2; to bowel complaints, 5; and 21 to injuries and unclassified causes.....

Cholera and small-pox are the two main causes of abnormal mortality in India, apart from famine and certain special outbreak of fever, which will be noticed below. Not a year passes without cholera in some part or another of the country, and there seems to be no sign of its becoming rarer or less fatal..... In spite of all the sanitary precautions adopted, the outbreak is still a matter of chance, and once it happens there is no limit to its local extension. As to small-pox, though it cannot be said to have been

stopped by the greater prevalence of vaccination nowadays, it is said to be of a milder type in some parts of the country where it was formerly frequent and severe. The returns of blindness seem to indicate this to a slight extent.

Excluding a small tract in the Himalayas where it has long been endemic, bubonic plague made its first appearance in India in modern times in Bombay City in September 1896 and, after spreading over the Western Presidency notwithstanding the measures taken to prevent its dissemination, gradually extended its ravage to other parts of India. By the date of the census the recorded mortality was nearly half a million, to which Bombay contributed seven-tenths and Bengal two-thirds of the remainder; Mysore with 33,731 reported deaths had suffered heavily in proportion to its population and so too had Baroda and Hyderabad. The extent to which the actual number of deaths exceeded that reported is uncertain, but it is known that the difference was very considerable and it may be assumed that the true mortality from plague was not less than three-quarters of a million and may possibly have been a million.

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Bihar :

...Purnea escaped the famine altogether, but it has sustained a loss of 3.5 per cent, or exactly the same as Champaran, where the decline is greatest in the very tract that suffered least from famine. Saran, which has a decrease of 2.2 per cent was far less severely affected than Muzaffarpur, which has gained 1.5 per cent and its loss of population is amply accounted for by the plague epidemic which was more virulent there than in any other district except Patna; the Gopalganj sub-division where the famine was worst has added slightly to its population of 1891. In Muzaffarpur and Darbhanga, the great rice-growing tracts under the Nepal frontier, which suffered most in the famine year, show the greatest growth of population. The decadent tracts in Muzaffarpur and Bhagalpur either escaped the famine altogether, or suffered from it only in a minor degree. The true causes of the decay in parts of North Bihar must, therefore, be sought elsewhere. Champaran and Purnea are well known to be unhealthy and have suffered since 1891, not only from malarial affections.

but also from severe epidemics of cholera. The outbreak of this disease in Purnea in 1900 was of unparalleled severity and no fewer than 46,240 deaths were laid to its account in the annual returns of mortality. The part of Bhagalpur that has lost population borders on Purnea and shares the unhealthiness of which that district is the victim. In Saran, as already noted, plague fully accounts for the decrease which is greatest where that disease was most fatal.

South Bihar includes all the plague districts except Saran, and its decrease of 3.6 per cent is mainly attributable to the direct and indirect losses caused by the epidemic; viz., a very heavy mortality, the flight of a great part of the immigrant population and, in some parts, the failure of the census staff to effect an exhaustive enumeration. Except in the west of Shahabad, the areas of greatest decadence exactly coincide with the areas that have suffered most from plague, and tracts that have been free from the disease have, as a rule, added to their population. Prior to the census the epidemic had been most virulent and most widespread in Patna, where the population has declined by 8.3 per cent as compared with 1891. The loss is greatest in the thickly populated urban and semi-urban country on the bank of the Ganges where the mortality due to plague was greatest. The southern part of the district which suffered least from plague has almost held its ground.

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Bombay :

Plague first appeared in Bombay City in September, 1896, and gradually spread all over the Province, especially in the Deccan and the south Maratha country, and in Thana, Cutch and the larger towns in Sind—Karachi, Hyderabad and Sukkur. The total registered mortality from plague up to the 1st March, 1901, the date of the census, was nearly a third of a million. The Superintendent has not given his opinion as to the extent to which these figures indicate the actual mortality, but it is well known that in the case of all serious outbreaks of epidemic disease the machinery for reporting vital occurrences becomes disorganised. The Plague Commissioners were of opinion that the true death-rate from plague was greater by at least 25 per cent than that actually reported, and in Bengal it has been estimated that the deaths from the

disease were more than twice as numerous as those shown in the returns; it would thus probably be safe to say that in Bombay the plague was responsible for a reduction in the population of from half to two-thirds of a million persons.

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Compared with the terrible ravages wrought in Gujarat by a single year of famine, the districts of the Deccan, which in the quinquennium between 1896 and 1900 endured two famines and suffered from short crops in the other three years, and which have also been smitten hard by the plague, show a wonderfully small loss of population. In Poona, Ahmednagar, and Satara, the decrement is from 6 to 7 per cent, but in the other districts it is considerably less. If it be conceded that the mortality from plague is double that actually reported, this alone would account for nearly the whole of the falling off in Poona and Satara.

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Mysore :

The public health was fairly satisfactory until plague appeared in August 1898 and did great mischief. The total registered mortality from this cause up to the time of the census exceeded 35,000 of which more than half occurred in the cities of Mysore and Bangalore, including the Civil and Military Station.

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(b) Extracts from the All-India Census Report, 1911

... On the whole, however, the decade might perhaps have been regarded as an average one from the point of view of the public health, had it not been for the ravages of plague, from which India had been practically free in recent times, until it broke out in Bombay in 1896. Spreading from that city it had already by March 1901 caused a recorded mortality of about half a million. Since then it has continued its ravages, especially in Bombay and Upper India. The mortality from it rose from about a quarter of a million in 1901 to 1.3 millions in 1907. It fell below a quarter of a million in each of the next two years, but in 1910 it exceeded half a million. The total number of deaths from plague during the decade was nearly 6.5 millions, of which over one-third occurred in the Punjab and two-fifths in the United Provinces and Bombay taken together. The disease fortunately has failed to establish itself in Bengal, Assam and

on the East Coast and in the extreme south of the peninsula. This moreover is only the recorded mortality. As is well known, when epidemics are raging the Reporting agency breaks down and a large number of deaths escape registration. The omissions are most numerous in the Native States, where registration is usually far less accurate than in British territory. A peculiarity of plague which has been noticed and explained elsewhere is that, in northern India at least, it attacks women more than men, and people in the prime of life more than the young and old. Consequently its after effects must shortly become apparant in a diminished birth-rate in the tracts most seriously affected.

Bombay Deccan North and Gujarat.

....During the greater part of the decade plague continued to be prevalent causing a registered mortality of 1.4 millions in Bombay Presidency.Kaira in Gujarat and Satara in North Deccan showed decrease in population due to Plague.

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North Bihar Plain and South Bihar Plain:

....The decrease of 4.9 per cent in Saran follows on a decrease about half as great as the previous census. These losses are due to plague, which was responsible for 166,000 deaths during the decade. There is moreover extensive emigration from this district.

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Mysore:

The agricultural conditions were normal and there has been marked progress in various Industrial undertakings. On the other hand there have been heavy losses from plague especially in towns; and malarial fevers have been prevalent in the Malnad or Western division. The net result of these opposing factors is the comparatively small increase.

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Madras Deccan:

The Deccan division is a landlocked area with no Industries; its red soils are poor, and though the black cotton soil found in many parts is fertile it is easily affected by drought as well as by excessive moisture. The Bellary district in

this division suffered badly both from plague and malaria.

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East, West and Central Uttar Pradesh:

The western, central and eastern divisions of the Indo-Gangetic plain, which all show a decrease, are amongst the most prosperous in the Province, but their death rate was abnormally high. The malaria epidemic of 1908 fell with special severity on the western while plague was the worst in the Eastern division. From the latter tract moreover there was extensive emigration. The districts which showed a loss of population were not only prosperous but also in normal years healthy. The malaria epidemic appears to have made most headway in those districts where the disease is not as a rule specially prevalent and least in those in which it is in a high degree epidemic.

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East Rajasthan Plain:

— This division suffered most from Plague, fever and crop failure during the decade....

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Bombay Deccan Southern:

In Karnatak the population was stationary. Plague was the cause of decrease of population in Dharwar and Belgaum....

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Punjab Plain & Pepsu:

The material conditions were all in favour of growth. Unfortunately except in the Western districts, the State of Public Health has been deplorable—Plague which first appeared in the Punjab in 1896, prevailed throughout the decade, and in British territory alone was responsible in all for about two million deaths of which nearly one third occurred in 1907. Malaria also has been terribly prevalent especially in the irrigated tracts in the eastern and central districts. It was worst in 1908 and the first three years of the decade. Altogether in British districts alone, four and a half million deaths from 'fever' were recorded.

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(c) Extracts from All-India Census Report, 1921

....1917,....was wet and unhealthy and a virulent outbreak of plague in the north and west

of India caused heavy mortality...the deaths recorded are less than half that number (*i. e.* half of 6.5 millions of 1901-11). There were however serious outbreaks of plague in Bombay, the Punjab, the United Provinces and the Central Provinces in the first two years of the decade, the mortality was again high in 1915 and higher still in 1917 and 1918, when the disease was severe in practically every part of Northern and Central India. Cholera is normally most prevalent in the Eastern Provinces. It was specially virulent in Assam and in parts of Bihar and Orissa and Bengal; while in several provinces outbreaks of the disease either accompanied or immediately followed the influenza epidemic. Cholera in its most severe form has usually been associated with the deterioration in physique which accompanied famine conditions before famine organisation had been perfected. Virulent as the epidemic can still be when its hold is established it is now usually of a temporary and local nature, and the total death-rate in British India from the disease during the decade did not amount to more than 1.5 per cent.

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Assam:

Though there was no plague, outbreaks of cholera and dysentery occurred in various districts.....

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Bihar and Orissa:

...The first sign of trouble in 1918 was an acute outbreak of cholera in the hot weather; in that year over 200,000 deaths occurred from this disease.....

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Bombay:

...Plague was specially virulent in the first year of the decade and in the years 1916, 1917 and 1918, but the total number of deaths from the epidemic in the decade was only about half the number of the previous decennium.....

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Punjab:

...Mortality from plague in 1915 and from malaria and relapsing fever in 1916 and 1917 had already checked the natural growth of the population.....

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Uttar Pradesh:

...The decade opened with an unhealthy year (1911), in which there was a severe epidemic of plague responsible in itself for a mortality of 7 per mille. Cholera was prevalent and the fever rate abnormally high. The subsequent five years were normally healthy, but in 1917 malaria was more prevalent than usual and plague persisted into the summer months.

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The year 1918-19 is probably, in the matter of health, the worst on record. Apart from severe epidemics of plague and cholera, the province was devastated in the late summer and early winter by influenza.

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Influenza persisted in 1919-20 which was also a very unhealthy year. Though plague was negligible, there was a fairly severe epidemic of cholera, and a large proportion of the population had undoubtedly been left by the influenza epidemic of the previous year too weak to offer serious resistance to disease in any form. Public health was also unsatisfactory in 1920-21. The province was almost free from cholera and plague, but malaria was very prevalent.

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Hyderabad:

Plague was prevalent throughout the period, causing a mortality of over 194,000 persons, while the death rate from cholera was heavy in several years.

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The city of Hyderabad which has three times during the decade been visited by plague shows a fall in population amounting to 19.4 per cent.

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Part D—Malaria, Kala-Azar and Fevers

(i)—Extract from the Indian Famine Commission Report—1880

RELATION OF FAMINE MORTALITY TO NORMAL MORTALITY

.....There is no doubt not only that the general death-rate when compared with that of England is high, but that it is liable to far greater variations. The yearly death-rate of many Indian towns (where registration can be more exactly conducted than in the country) appears from the reports of recent years to have risen occasionally for many months together to rates varying from 40 to 100 per mille, and even higher. In the months of September and October 1879 a mortality was registered in the North-West Provinces which in some districts suddenly raised the death-rate from its ordinary total of about two or three per mille per month to nearly 40, and the ratio for the whole province for the month of October rose from 3.4 to 10 per mille. The abnormal mortality had not wholly ceased by the end of December 1879, and the effect of this was that in the district that suffered most the actual death-rate of the year 1879 rose from an average of 40 to 118 per mille, implying an increased mortality of 78,000 on a population of a million; and in the whole province, the actual mortality of the year rose from an average of 23 to 45 per mille, which indicates an increase of 924,000 deaths on a population of 42 millions. These rates are considerably in excess of those which have prevailed in districts suffering most acutely from famine. In the worst month of 1877 the death-rate only reached 49 per mille per annum for the entire Bombay presidency, and 60 per mille for the entire Madras Presidency. If special districts are compared, the highest rate in the worst month in the worst district of Madras was 13 per mille per month, and in the worst district of Bombay it was 12 per mille; in the two worst districts of the North-West Provinces in 1879 it rose to the extraordinary height of 37 per mille. Even these rates are exceeded by some which have been reported at times in some towns of the Punjab. It is certainly to other causes than a deficiency of food that such mortality must in many cases be referred. In 1879, in the districts just referred to, no scarcity whatever existed, prices throughout the whole country were moderate, the autumn harvest had been exceptionally good, and the mortality was attributed by the sanitary authorities to a severe outbreak of malarial fever.

We are therefore forced to conclude that the population of India is exposed continually to destructive agencies, which under more favourable conditions might be regarded as preventible, but against which society has at present neither the means nor the knowledge necessary to secure its protection. Large numbers of the people live in so primitive a condition, irrespective of anything that can properly be called poverty, as to render them liable to disease against which, they have no effectual remedy or defence. Epidemics may sweep them off by tens of thousands without attracting attention, because these agencies are incessantly at work. Famine, which intensifies their activity, is more conspicuous from its less regular recurrence, but it is really only one and perhaps not the most deadly, of numerous influences by which at present human life among the people of India is cut short, and which can be effectually counteracted only by the general advance of society in wealth, knowledge, and material resources.

(ii-a) Extract from the All-India Census Report, 1891

.....Fever.....includes a variety of diseases, amongst others, influenza, in the form in which it was prevalent during the past three years. There are, however, certain classes of fever that seem confined to special localities, which they ravage for a few years, and often disappear as unexpectedly as they broke out. For instance, in the Brahmaputra valley of Assam, the "black sickness" (kala-azar), that broke out some years since, has been peculiarly destructive to life along the southern bank and has also crept across to few tracts on the northern bank. For some time it baffled medical research, but its nature was thoroughly investigated in 1890 by a competent expert, who found the disease to be largely due to the insanitary habits of the villagers. The name he proposed for it was parasitic anaemia, or anchylostomiasis. Whatever it may be, its results are painfully apparent in the two districts where it has been rife for the longest period, and the provincial Superintendent of the Census attributes to it a loss of over 100,000 people during the decade. Another instance of epidemic fever is that popularly known as the Burdwan outbreak, from the name of the district where it was specially prevalent some years ago. The tract, however, has obtained this bad eminence unjustly, for it seems that the disease originated further in the

delta, about Midnapur, where it is attributed to the water-logging consequent on the choking of the natural drainage channels of this part of Bengal, by reason of the gradual changes in the course of the main estuaries.....and affects the returns of four large districts. It is not only in the lower part of the Gangetic basin that water-logging has occurred. In the south-east of the Punjab the natural drainage has been obstructed to some extent, and portions of the Karnal and Delhi District have passed out of popular favour, apparently for good sanitary reasons..... (In the case of the southern portion of the Ganges Doab.....however, there does not seem to have been so much an increase of mortality as the abandonment of the soil because it deteriorated for agricultural purposes. Along the borders of the Tarai, or sub-Himalayan forest and grazing tract in Rohilkhand on the other hand, fever has increased in prevalence during the last decade or so, though it is not said to be of so special a type as that of Burdwan or Assam.....In other parts of the country there have been outbreaks of fever due to some local cause, such as that in Amritsar in the Punjab, where the city population fell off by 11 per cent., whilst the rural tracts surrounding it continued to increase. In other cities, too, the malady we now call "influenza" grew to the intensity of an epidemic, and carried off numbers of the inhabitants in the few weeks.....

The spread of vaccination, though uneven, is doing much to mitigate the ravages of small-pox. Cholera, which it seems impossible to prevent altogether, is localised by segregation, or by the strong measure of prohibiting religious gatherings, whenever they are likely to lead to an outbreak of this scourge, and in all such cases the sanitary arrangements of the locality are placed under the control of special superintendents. As for normal disease, every year sees an increase in the number of dispensaries, which are, in fact, small hospitals under trained men, scattered about the rural tracts, whilst in larger towns the lower grade medical practitioner, turned out by the Universities, is growing in popular favour against the rivalry of the herbalist and exorciser.

(ii-b)—Extracts from All-India Census Report, 1901.

Assam:

.....In the centre of the Brahmaputra Valley two districts are conspicuous for a decrease in

their population. Nowgong has lost 86,147 people, or nearly 25 per cent of the population recorded in 1891, while Kamrup has declined by 45,062 or 7 per cent. In both cases the chief cause of the decrease is the virulent and communicable form of malaria known from the darkening of the skin which is one of its symptoms, as *kala-azar* or the black sickness. This disease, which is probably identical with the Rangpur and Burdwan fevers and the *kala-duk*h or *kala-jwar* or *Pumes* and the Darjeeling terai, was first observed in the Garo Hills in 1869; when the Garos were so impressed with its infectious character that they "are said to have not only abandoned their sick, but to have stupefied them with drink and then set light to the houses in which they were lying in a state of helpless intoxication". By 1883 it had spread to the Goalpara sub-division which showed a decrease of 29,699 persons at the census of 1891. Five years later *kala-azar* entered Kamrup and reduced the population of the southern part of the district by nearly 12 per cent. Having spent its force there it passed on, in 1892, to Nowgong where its track is marked by deserted villages, untilled fields, all land revenue reduced by 23 per cent and a disheartened population which, after 19 years of steady increase, has now receded to the figure at which it stood nearly 30 years ago... There can be little doubt that *kala-azar* has done much to retard the natural development of Assam.

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Bengal :

The decline of nearly 3 per cent in West Bengal during 1872-81 was caused by the epidemic of Burdwan fever which ravaged the alluvial tracts of the division and was estimated at the time to have caused about two million deaths besides materially impairing the reproductive capacity of the population.

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In Western Bengal the increase is 7 per cent varying from 13 per cent, of natural growth in Birbhum, which is recovering from a cycle of malaria, to 1.4 in Hooghly, where fever is rife and the population would have been stationary but for the influence of the mills and factories of Serampur.

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In the earlier part of the decade the rainfall was excessive and badly distributed, and not only

caused serious damage in many parts to the crops, but also led to a severe outbreak of malarial fever, which in 1894, raised the death-rate to an exceptional height and sapped the vitality of the people to such an extent that the birth-rate in 1895 was unusually low.

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(ii-c) Extracts from the All-India Census Report, 1911

.....In the decade which has just ended epidemics of malarial fever decimated the irrigated tracts of the Eastern and Central Punjab and the Ganges-Jumna Doab in the United Provinces, where in 1908 alone the reported mortality from "fevers" was nearly two millions.

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Assam :

.....In several years there were Cholera epidemics but on the whole the public health was satisfactory. *Kala-azar* has disappeared and there has been no plague.

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Bombay-Konkan :

The net increase in Konkan was only 2 per cent. There was a decrease in Kolaba due to emigration to Bombay city and in Kanara due to Malaria.

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Punjab Plain and Pepsu :

The material conditions were all in favour of growth. Unfortunately except in the Western districts, the State of Public Health has been deplorable. Plague which first appeared in the Punjab in 1896, prevailed throughout the decade, and in British territory alone was responsible, in all for about two million deaths of which nearly one-third occurred in 1907. Malaria also has been terribly prevalent especially in the irrigated tracts in the eastern and central districts. It was worst in 1908 and the first three years of the decade. Altogether in British districts alone, four and a half million deaths from 'fever' were recorded,

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(ii-d) Extracts from the All-India Census Report, 1921

.....By far the largest number of deaths in India are entered under the category of "fever", and allowing for inaccuracy of diagnosis it has

usually been assumed that about two-thirds of the deaths so recorded may be ascribed to malaria. Recent investigations made in special areas, however, suggest that this proportion has been considerably over-estimated and that malaria only accounts for from one-fifth to one-fourth of the number of reported fever cases, the remainder being cases of dysentery, pneumonia, phthisis and other diseases. Malaria is endemic in large areas of the continent, both in the forest-clad country which fringes the mountain ranges and in tracts of Bengal, Assam and Burma, where the configuration of the country prevents the drainage of the flood-water after the monsoon. In such areas, besides raising the average level of the death-rate, it permanently lowers the vitality of the people and reacts both on the birth rate and on their general economic condition. In parts of western Bengal the population has been described as sodden with malaria. Epidemic malaria was specially severe in the Punjab and United Provinces in the earlier years of the decade and again in 1917 when, owing to the specially heavy monsoon, mortality from this disease was high in almost every province. In the last few years the prevalence of an affection which is the cause of considerable mortality called Relapsing Fever has received considerable attention by the Health Department. This disease has been diagnosed as common in most parts of the country, specially in the Northern Provinces and in the Central Provinces and Berar and Bombay, but the extent of the mortality which can be ascribed to it cannot at present be estimated. Nor can figures be given of phthisis which is undoubtedly responsible for considerable mortality; especially in the towns of western India, the deaths from this disease in Ahmedabad amounting in 1918 to 5 per mille of the population. All other factors in the health of the people have, however, been overshadowed by the influenza epidemic of 1918 and 1919 which has dominated the population figures at the present census.

* * * * *

Assam :

There was a recrudescence of *kala-azar* during the decade.....

* * * * *

Bengal:

Malaria was specially severe throughout the period, which was characterized by a low birth

rate and a mortality which in several districts steadily exceeded the number of births.....

* * * *

(ii) **Extract from the All-India Census Report, 1931**

.....every year sees improved methods of fighting such epidemics as cholera, plague or 'Kala-azar'. Indeed a completely effective treatment for the latter pest has been perfected since the last census, and has made it possible to stamp

out the disease. The antimony treatment of 'Kala-azar' was discovered as early as 1913, but the original treatment took three months to apply and therefore did little to prevent the epidemic. The treatment with organic antimony compounds, introduced about 1917, reduced the period of treatment to a month. The improved treatment introduced during the 1921-31 decade however cures the disease in ten days or even less.

* * * *

Part E— The Great Influenza Pandemic

Extract from All-India Census Report, 1921

The *Influenza Epidemic of 1918* invaded the continent of India in two distinct waves. The first infection apparently radiated from Bombay and progressed eastward from there, but its origin and foci are uncertain. It may have been introduced from shipping in Bombay during May, and there is a suggestion of some sort of mild influenza in the Bombay district, Delhi, and Meerut in the spring; but the existence of the disease in epidemic form cannot be established without doubt before June. The disease became general in India in both the military and civil population during August, and infection spread rapidly from place to place by rail, road and water. The first epidemic was most prevalent in urban areas, but it was not of a specially virulent type and, probably for that reason, it is said to have affected young children and old people most severely. The mortality curve went to a peak in July and then dropped, and there is evidence of a distinct interval between the first and second waves but not of any real break of continuity, as sporadic cases were reported throughout the intervening period. It is impossible to say where the more virulent virus of the second invasion came from. There are certain facts which suggest that the disease began in the Poona district in September. It appeared from province to province, lasting in a virulent form generally from eight to ten weeks, when mortality, usually due to respiratory disease, reached highest point. The rural areas were most

severely infected, the reason probably being that while villages have little advantage over towns in the matter of overcrowding, sanitation and ventilation the urban areas have the benefit of qualified medical aid and organised effort. Mortality was specially high among adults (20-40), particularly among adult females, the disease being generally fatal to women in pregnancy. It is suggested that the high mortality among women may have been due to the fact that, in addition to the ordinary tasks of the house, on them fell the duty of nursing the others even when themselves ill. The figures show that the excess mortality between the ages 20 and 40 amounted in some cases to nearly four times the mean. It is no exaggeration to say that at the worst period whole villages were absolutely laid desolate by the disease. There was sometimes no means of disposing of the dead, crops were left unharvested and all local official action was largely paralysed, owing to the fact that the majority of the official staff was put out of action by the epidemic. To add to the distress the disease came at a period of widespread crop failure and reached its climax in November when the cold weather had set in; and, as the price of cloth happened at the time to be at its highest, many were unable to provide themselves with the warm clothing that was essential in the case of an illness that so readily attacked the lungs. The disease lasted in most provinces well into 1919 and gave a high mortality in that year in Bengal and the United Provinces. Even after it had subsided there were in the Central Provinces, Bombay and Burma mild recrudescences later in

the year, while local outbreaks continued over the country during the next two years.

.... It is not possible to explain the peculiar variations in the local prevalence of the disease which seems to have been entirely capricious in its incidence. The coast line escaped with a low mortality while in the hilly country the disease was usually specially fatal, though this was apparently not always the case in the Punjab. The Eastern Provinces escaped lightly and Calcutta was not attacked as severely as other cities. It has been suggested that the mortality was determined by the comparative liability of the people to respiratory complications, or, in other words, their susceptibility to pneumonia, and it looks as if the epidemic was more virulent in a cold dry climate than where there was comparative warmth or humidity.

There is no direct means of ascertaining the mortality from the epidemic. Influenza was unknown to the registration staff as a specific form of illness and the deaths were entered

under the heads fever or respiratory disease. Various estimates have been made based on the excess mortality over some suitable mean. The average of these calculations gives a total number of deaths in the areas under registration of about 7,100,000 in 1918, as shown in the marginal table; to which must be added, as the results of similar calculation, another 1 1/3 million deaths in 1919, giving a total recorded mortality of nearly 8 1/2 millions in the two years. Even this, however, must be a substantial underestimate since, owing to the complete breakdown of the reporting staff, the registration of vital statistics was in many cases suspended during the progress of the epidemic in 1918 and when the time came to reconstruct the figures the number of omissions, especially in the case of women, must have formed a high proportion. In some cases the Census Superintendents give estimates of deaths considerably higher than those given in the margin, which are taken from the Sanitary Commissioner's Report..... there is a difference of nearly 4 millions between the census figures and the deduced population, a considerable proportion of which must be due to omissions of influenza deaths. In any case the figure given above applies only to the areas under registration, which contain little more than three-quarters of the population of India. The epidemic was especially virulent in the Rajputana and Central India Agencies and in the States of the Punjab, Central Provinces and Bihar and Orissa, while the attack was severe in Kashmir and Mysore and acute in Hyderabad and parts of Baroda. We have no statistics for these areas, at any rate none that are trustworthy, but a rough estimate would put the direct mortality, in them, from the disease in 1918 and 1919, at least in the same proportion as in British territory. We thus arrive at a total mortality of between 12 and 13 millions for India. It is interesting to note that even this conservative estimate of a mortality, the large part of which occurred in the space of three or four months, exceeds by nearly two millions the total estimated deaths from plague - extending over 20 years (1898-1918), and is a good deal more than double the death-rate directly attributable to the famines, of the period 1897-1901. The number of deaths, however, is not, of course, the measure of the loss of life from the epidemic. The case mortality has been put roughly at about 10 per cent and on this basis the total number of persons affected by the disease was about 125 millions or two-fifths of the total population of India.

<i>Province</i>	<i>Estimated number of deaths</i>	<i>Death-rate per mille of population of col. 2</i>
Ajmer-Merwara	20,835	59.5
Assam	111,340	18.6
Bengal	386,572	8.5
Bihar & Orissa	709,976	20.5
Bombay	1,059,497	54.9
Burma	137,491	13.9
C.P. & Berar	924,949	66.4
Coorg	2,014	11.5
Delhi	23,612	56.6
Madras	682,169	16.7
N.W.F. Province	89,035	43.6
Punjab	898,947	45.4
United Provinces	2,034,257	43.4

Part F—The Bengal Famine 1943

Extract from Inquiry Commission
Report on Bengal, 1945

B—THE CAUSES OF THE BENGAL
FAMINE

* * * * *

4. The crisis in Bengal which culminated in the famine began by the end of December 1942. The shortage of supplies developed rapidly in Greater Calcutta and became acute in March 1943. The measures taken by the Government of Bengal and the Government of India succeeded in averting a catastrophe in Greater Calcutta. At the same time distress was developing more slowly but steadily in other parts of Bengal, and successive efforts to avoid disaster failed. Famine raged over large areas in the province and came to an end only with the reaping of the *aman* crop in December 1943.

5. On a review of all the facts which we have set out in earlier chapters, we are led to the following conclusions about the causes of the Bengal famine :—

I. During 1943, there was a serious shortage in the total supply of rice available for consumption in Bengal as compared with the total supply normally available. This was due to

- (A) a shortage in the yield of winter rice crop (*aman*) of 1942, combined with
- (B) a shortage in the stock of old rice carried forward from 1942 to 1943.

II. Out of the total supply available for consumption in Bengal, the proportionate requirements of large sections of the population who normally buy their supplies from the market, either all the year round or during a part of the year, were not distributed to them at a price which they could afford to pay.

This was due to

- (A) The incapacity of the trade operating freely in response to supply and demand, to effect such a distribution in the conditions prevailing; and
- (B) The absence of that measure of control, by the Bengal Government, over producers, traders, and consumers in Bengal necessary for ensuring such a distribution,

III. The supply of rice and wheat which, under normal conditions, would have been available to Bengal from sources external to the province, was not available during the closing months of 1942 and the early part of 1943. This was due to

- (A) The loss of imports of rice from Burma; and
- (B) The delay in the establishment of a system of planned movements of supplies from surplus provinces and states to deficit provinces and states.

* * * * *

4. While the Commission cannot accept popular views on mortality, it is nevertheless of the opinion that the official figures underestimate the total number of deaths. In rural Bengal, as elsewhere in India, the primary collector of mortality statistics is a village functionary to whom deaths are reported by relations of the deceased in the village. The village chowkidar* (previous to 1944), reported deaths to the Union Board Office, whence by several stages the records ultimately reached the office of the Director of Public Health. The chowkidar also reports the cause of deaths. In normal times the system scarcely lends itself to scientific accuracy and in 1942 and 1943 other factors making for errors and omissions were introduced. In certain places the salaries of chowkidars were not paid and they deserted their posts to obtain work on military projects and aerodromes. During the famine chowkidars were not immune from starvation and disease and some of them died. The replacement of dead and the vanished chowkidars was no easy matter and several weeks or months might elapse before successors could be found, during which deaths presumably went unrecorded. Further, in the height of the famine thousands of people left their homes and wandered across the countryside in search of food. Many died by the roadside—witness the skulls and bones which were to be seen there in the months following the famine. Deaths occurring in such circumstances would not be recorded in the statistics of the Director of Public Health.

* * * * *

* The Chowkidar or village watchman is a part-time village servant, usually illiterate, and paid about Rs. 6 or Rs. 7 a month.

7. In spite of the conditions produced by the famine, there was no universal breakdown in 1943 in the system of recording deaths. We made careful inquiries on this point from local officials and other witness. After due consideration of the available facts we are of the opinion that the number of deaths in excess of the average in 1943 of the order of one million—that is, some 40 per cent. in excess of the officially recorded mortality. We have found no valid reason for accepting estimates in excess of this figure. On the other hand, the high excess mortality in 1944 must be added to the toll of mortality. On this basis we must conclude that about 1.5 million deaths occurred as direct result of the famine and the epidemic which followed in its train.

* * * * *

HEALTH PREVIOUS TO THE FAMINE

1. In normal times, malaria, cholera, and small-pox are endemic in Bengal and serious epidemics of these diseases are of recent occurrence. The state of nutrition of a considerable section of the population was poor. The same can of course be said of many other parts of India. The calamity of famine fell on a population with low physical reserves and circumstances were favourable for a flare-up of epidemic disease. The association between health conditions in normal times and the high famine mortality must be underlined.

* * * * *

LACK OF FOOD

2. A high proportion of the deaths which took place in the early stages of the famine can best be described as deaths from starvation. It is true that disease of some kind or other was usually present in starving patients, adding to the seriousness of their condition. Very commonly such patients suffered from "famine diarrhoea", often seen as an uncontrollable diarrhoea which led to dehydration, rapid weakening and death. Other kinds of disease were also frequently present in starving destitutes. There was a considerable excess mortality from malaria and cholera as early as July, 1943. The difference between death from simple starvation and death

occurring in a starved individual who is suffering from disease is of medical interest, but a negligible difference when the broad facts of famine mortality are under consideration.

3. We can perhaps roughly distinguish between two phases of famine mortality and disease. During the first months of the famine the emphasis was on starvation, with or without coincident disease, a cause of death. At a somewhat later stage, epidemic diseases took precedence over starvation. The peak in cholera mortality occurred in October and November, 1943, while in the case of malaria December stands out as the worst month. By the end of the year, with the reaping of the *aman* crop, and the provision of food to the famine victims through the medium of relief kitchens, etc., deaths from sheer starvation diminished. When this stage was reached the main medical and public health problem became that of epidemic disease, notably malaria. But even when relief measures had been in operation from some time, and adequate supplies from the province as a whole were available, the recovery of sections of the population from under and malnutrition was slow, and survivors belonging to the classes affected remained in a poor state of health. Throughout the famine the provision of suitable nourishment to patients in famine hospitals was of primary importance in treatment, although it was in the early stages that the problem of resuscitating cases of starvation by suitable therapeutic measures was most acute.

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DISEASES IN CALCUTTA FAMINE HOSPITALS

4. Epidemic diseases were prevalent among famine victims, in Calcutta as in other parts of Bengal. For example, investigations carried out in Calcutta towards the end of 1943 showed that some 40 per cent of destitute patients harboured malaria parasites. In general the picture seen in the Calcutta emergency hospitals from August to November, 1943 was that of acute starvation and its effects. Many of the patients in the hospitals were picked up on the streets in a state of extreme weakness and collapse, often on the point of death. They were for the most part emaciated to such a degree that the description "living skeletons" was

justifiable. Weight was often reduced by as much as one-third of the normal; that of men who normally weighed 120 to 130 lbs. fell to 80 to 90 lbs. When this degree of emaciation is reached as Alexander Porter points out in his book "The Diseases of the Madras Famine of 1877-8", "life is held by a slender thread which the least untoward circumstance is sufficient to snap".

6. The exact causes of so-called "famine diarrhoea" are at present unknown. When the famine was at its worst, famine diarrhoea was perhaps the most formidable problem with which the medical relief agencies had to deal.

* * * * *

EPIDEMICS

13. Severe epidemics of malaria, small-pox and cholera were associated with famine.

The malaria season in Bengal normally extends from July to December. A severe and widespread epidemic, beginning in June, occurred during the latter half of 1943, reaching its peak in December and continuing in 1944. From July to December 1943, 479,039 deaths from malaria were recorded, an excess of 266,208 deaths (125.1 per cent) over the quinquennial average. In the first 6 months of 1944, malaria mortality figures were of the same order; 400,901 deaths were recorded which was 223,664 deaths (126.1 per cent) above the average. Excess deaths from malaria accounted for 41.5 per cent of excess deaths in 1943 and 53.0 per cent of excess deaths from January to June 1944. In December 1943, the reported deaths from Malaria were 202.6 per cent in excess of the quinquennial average.

APPENDIX V
SHORTAGE OF FOODGRAINS

APPENDIX V

Shortage of Foodgrains

PART A—Note on Production, Consumption and Shortage of Foodgrains in India—1951

OUR STATISTICS of the yield of crops are based on the independent determination of two factors: (i) cultivated acreages and (ii) estimates of yield per acre of different crops. An explanation of the merits and defects of the former will be found in the introductory note to APPENDIX I. The determination of the latter, *viz.*, yield per acre, is based ultimately on the assessment made by very large numbers of primary reporters—village accountants (where these exist) and *chaukidars* (where village accountants do not exist). They assess the condition of the crop shortly before the harvest, and record their assessment not in absolute quantities—in maunds, tons etc.—but in ‘*annas*’ which are relative proportions of an assumed ‘normal’ crop. The average of these proportions is then struck for tehsils, districts and higher territorial units, and the *annas* are translated into absolute quantities at the headquarters of State Governments.

2. As in every system, there are possibilities of error. These are mainly of two types. One type of error may arise at the source. What is ‘normal’ is not fixed quantitatively for the guidance of the primary reporter. He is, therefore, estimating the proportion of an unknown; and though, in general, his concept of the unknown is steady, it may not always be so. Again, his smallest unit of estimation, the ‘*anna*’ may be anything between one-eighth and one-twelfth of a ‘normal’ crop, which is rather a large unit; and, in practice, he might ordinarily assess in terms of multiples of *two annas* rather than an *anna*. It is frequently said that the primary reporter is prone to systematic under-estimation, but there is no real evidence in support of this statement. The chances are that errors occur in either direction on a purely random

basis, and since there are a very large number of primary reporters, the absence of systematic bias should be counted as a merit of the system.

A more important type of error might arise at the stage of translation of the average ‘*anna*’ values into tons; for, at this stage, ‘systematic errors’ may be introduced by adopting a ‘standard yield rate’ for each district which may be too high or too low. The rates are, in fact, fixed after very careful enquiries. Two different departments of every State Government usually co-operate in carrying out crop-cutting experiments, which yield the data necessary for the purpose. In recent years, an important improvement has been introduced. At the instance of the Statistical Section of the Indian Council of Agricultural Research, crop-cutting experiments are organised under adequate technical system, on a random sample lay-out. The results are helping to provide a rough dimensional comparison; but they have not yet reached a stage at which they may be related to the basic data and a single set of firm estimates with a determinate margin of error can be furnished. So much for data relating to production of foodgrains.

3. There are no data about grain consumption to provide a systematic time-series for defined areas—similar to acreage and yield statistics. There are only fragmentary results of special enquiries made at different times, in different places, by different agencies.

There are considerable variations in the rates between the sexes, among different age-groups, between villages and towns, among people working in different avocations, among

people living in different climates, and among people having different dietary habits. Again, it is probable, though this is less firmly established, that there is a slightly larger rate of consumption in years following good crops and a slightly smaller rate of consumption in years following poor crops. It is also likely that, when population increases, the relative proportion of population groups having different rates of consumption does not remain the same, but changes. In view of all this, the determination of average rates of grain consumption is subject to very much greater uncertainty than the birth-rate, the death-rate or the yield-rate of foodgrains per acre.

4. In our present state of knowledge, it is not possible to assess our shortage of foodgrains either for the country as a whole or for a state or a district by direct computation of production and consumption and subtraction of the former from the latter. The reason is that no one can be sure of any estimate of consumption within a margin of error of say, 10 to 15 per cent. Likewise, no one can be sure about any estimate of production, within a margin of error of say, 5 to 10 per cent. But since it is reasonably certain that the shortage of all foodgrains does not exceed 10 per cent of the production of all foodgrains, we cannot possibly say—by reference merely to estimates of production and consumption—whether there is a shortage at all and if so, of what order. One other complication should also be mentioned. All foodgrains produced are not eaten by human beings. Some are sown again as seed. A little is fed to cattle. There is wastage at various points between the field and the kitchen. [Some grain may be used for starch-making or distillation but this is negligible.] We do not have a firm idea of the magnitude of these factors. Thus, there is a definite shortage of relevant information. This does not mean that the shortages cannot be (or are not) assessed with sufficient accuracy for enabling practical decisions to be taken. The statistics for import, export, or transport by rail are available for a long period. Statistics of the 'State trading system' and the working of ration shops are available for nearly ten years. When these statistics are interpreted by the authorities who are actually responsible for distribution of food, correct judgments are reached. Thus we have figures of three different types—each of which presents its own difficulties and defects—and

we have to piece them together in order to form the best possible judgment.

5. Among the papers in Part E of this APPENDIX there is a statement which shows the operation during the calendar years 1949, 1950 and 1951 of state trading in foodgrains. It shows that on the average 43.0 lakhs of tons were annually procured from all parts of India; 34.8 lakhs of tons were annually imported; and 77.1 lakhs of tons were annually issued from government stocks (to ration shops and other distributing agencies operating under government control). The difference between issues and procurement (77—43) 34 lakhs of tons per annum is the best measure of the average actual level of shortage of foodgrains in India. It is arguable that it is not a good measure for any of the following reasons :

- (i) Three years is a short period for an average—and the crop may have been subnormal. If so, the true shortage may be less.
- (ii) There may have been a build-up of private stocks during the three years outside the state trading system. If so, the true shortage may be less.
- (iii) There may have been compulsory over-procurement of stocks which, under the given crop conditions, would normally have been retained unsold by producers. In that case, the true shortage may be more.
- (iv) The consumption under the rationing system may have been smaller than it would normally have been under free trading conditions. In that case, the true shortage may be more.

In the last resort it is a matter of opinion. Having regard to the persistence with which prices rise whenever and wherever free trade is extended, it seems to the present writer that the average level of the true shortage—round about 1951—was probably somewhat higher than 34 lakhs (but not perhaps as high as say, 40 lakhs). We have got figures showing the statewide distribution of government stocks. On the basis of

these figures, the zonal break-up of shortage* of foodgrains may be estimated as shown below :

TABLE I

Zone	Foodgrain shortage per annum	
	(IN LAKHS OF TONS)	(IN LAKHS OF MAUNDS)
North-India	1.9	52
East India	6.9	188
South India	9.9	270
West India	10.5	287
Central India	0.9	25
North-West India	1.8	49
Zonally unspecified	2.2	60
INDIA	34.1	931

The uncertainties mentioned above, about the equivalence of true shortage with the balance of issues and procurement apply to each zone separately, more strongly than to India as a whole. But there can be no manner of doubt that West India and South India have a very well-marked and substantial deficit ; East India has a smaller

but nevertheless significant deficit ; and that these three zones account for well over three quarters of India's shortage of foodgrains.

6. On an average of 5 years preceeding 1951† the area of cultivated land in India was 2,867 lakhs of acres. More than one crop was raised on 377 lakhs of acres. In the result, the total 'gross area sown' was 3,241 lakhs of acres. This was made up of 743 lakhs of acres under rice, 396 lakhs under *jowar*, 209 lakhs under *bajra* and so on ; altogether making up a total of 2,526 lakhs of acres under 'all foodgrains'—this term being taken to include all the staple foodgrains as well as gram and pulses—but not including groundnut, gingelly or any other oilseeds. Reduced to 'per capita' terms, India cultivates 79 cents *per capita*. Reckoning the area sown more than once, the gross area sown *per capita* is 90 cents. Out of this area foodgrains are grown on 70 cents *per capita*.

The following table shows the break-up of the area of cultivated land, gross area sown and foodgrain cultivation among zones—as well as the corresponding 'per capita' figures.

Table 2

Zone	Lakhs of Acres			Per Capita (cents)		
	Cultivated land	Gross area sown	Foodgrain cultivation	Cultivated land	Gross area sown	Foodgrain cultivation
North India	393	489	426	62	77	67
East India	525	624	541	58	69	60
South India	404	458	318	53	61	42
West India	501	517	366	123	127	90
Central India	691	742	559	132	142	107
North-West India	353	413	316	90	105	80
INDIA	2,867	3,243	2,526	79	90	70

7. The official‡ estimates of production of foodgrains during the period of five years (1947-48 to 1951-52) were averaged separately for rice, wheat, *jowar*, *bajra* and all other foodgrains,

* The figures represent the excess of 'off-takes' from government Stocks, in each zone over the 'procurement' in that zone on an average during the three years 1949, 1950 and 1951.

‡ It is usual to refer to the estimates based on village returns described already as 'official' estimates in order to distinguish them from other estimates based on special enquiries.

and divided by the corresponding average acreage. Average yield rates were thus obtained zone by zone. Then an allowance for seed was deducted

† Figures for cultivation acreages are taken from Table 1.4 in APPENDIX I. Crop acreages include estimates for Statistical Category 'D' territories; the basis for estimates being the same as for 'net area Sown' vide Annexure I to introductory Note in APPENDIX I.

at the following percentages of yield, viz. rice (6.8), wheat (14.0), jowar (3.5), bajra (3.3) and all other foodgrains (7.5). [These deductions were based on information available with the

Directorate of Economics and Statistics of the Ministry of Food and Agriculture.] The results are shown below :

TABLE 3

(IN LAKHS OF MAUNDS)

Zone	Average yield of foodgrains						Deduct for seed all food-grains	Estimated annual yield (less seed of all food-grains)
	Rice	Wheat	Jowar	Bajra	All other food-grains	Total food-grains		
North India	540	714	144	154	1518	3070	249	2821
East India	2952	112	5	...	1140	4209	263	3946
South India	1350	...	301	134	968	2753	131	2622
West India	305	115	464	216	316	1416	80	1336
Central India	766	275	592	36	1021	2690	181	2509
North-West India	101	603	62	126	725	1617	167	1450
INDIA	6014	1819	1568	666	5688	15755	1071	14684

We now proceed to consider what, if any, corrections are required in the figures of the last column of this table in order to allow for errors in the estimation of yields.

Among the papers of APPENDIX I, there is a full statement furnished by the Statistical Section of the Indian Council of Agricultural Research showing what may be called the verified samples estimates of yield-rates as ascertained by random sample crop-cutting and comparing them with corresponding rates based on official estimates. We may review the results of this comparison.

8. Rice yield rates :-

UTTAR PRADESH (all divisions except Himalayan) : Official estimates are higher than the verified sample estimates, more or less consistently, in nearly all divisions by over a maund per acre.

BIHAR : The verified sample estimates are now adopted in recent years as basis for official estimates.

ORISSA (COASTAL) : Official estimates are consistently lower by about two maunds per acre.

MADRAS (all divisions except Madras Deccan) : Official estimates are consistently higher in North Madras and West Madras and lower in South Madras, except for one year in one division—the differences are generally very small.

BOMBAY (all divisions except Greater Bombay) : The results are variable. We see official estimates closely agreeing, being definitely higher, and being definitely lower—with more or less equal frequency. On the whole, the averages are probably in agreement.

MADHYA PRADESH (North-West & East) : There is no systematic difference in North-West Madhya Pradesh. In East Madhya Pradesh, the official estimates are consistently lower than verified sample estimates. The defect is variable and may change about a maund per acre.

9. Wheat yield rates :

UTTAR PRADESH (all divisions) : The official estimates are consistently higher than the verified sample estimates in Himalayan Uttar Pradesh. The other divisions show no definite trend.

Whether we compare different divisions for the same year, or different years for the same division, we find instances of official estimates exceeding verified sample estimates and *vice versa*. The differences also are not large.

BIHAR : Verified sample estimates are adopted in recent years as the basis of official estimates.

BOMBAY (The two Deccan divisions and Gujrat) : Official estimates are consistently higher than verified sample estimates in both the Deccan divisions and there is no definite trend in Gujrat. The differences are very small.

MADHYA PRADESH (all divisions) : More often than not the official estimates tend to be a shade higher in East Madhya Pradesh and a shade lower in North-West Madhya Pradesh and South-West Madhya Pradesh. The differences are small and variable.

PUNJAB (both divisions) : The official estimates tend to be lower than the verified sample estimates fairly consistently in the Plains. The difference varies from about half a maund per acre to about a maund per acre.

10. *Jowar and Bajra yield rates* : Random sample crop cutting has been carried out in three divisions of Bombay and three divisions of Madhya Pradesh.

BOMBAY : There is no indication of systematic difference between the two sets of estimates. The official estimates are sometimes higher, sometimes lower and sometimes in close agreement. This applies both to *jowar* and *bajra*. The differences are variable and not large.

MADHYA PRADESH : The same may be said about Madhya Pradesh also, in respect of *jowar*. There are no verified sample estimates for *bajra*.

11. *Yield rates in Rajasthan* : The foregoing review exhausts the areas and crops for which the results of random sample crop cutting carried out under the guidance of Indian Council of Agricultural Research are available. The only other important area for which the results of random sample verification are available is

Rajasthan. The verified sample estimates (which relate to one year only) are reported to exceed the official estimates consistently. The excess is reported to be large ; it varies with the crop and is highest for *bajra* —an important crop. Competent local officers are of opinion that the official estimates understate the true yield by 40 to 50 per cent.

12. The foregoing review indicates that the official estimates may be a shade overpitched in Uttar Pradesh, somewhat underpitched in the Punjab and Orissa, and more substantially underpitched in Rajasthan and substantially right in Madras, Bombay, Madhya Pradesh and Bihar. There is very little justification for the view, often expressed, that the official estimates have been intentionally underpitched in order to evade grain procurement obligations.

On the information available, no corrections are called for in respect of South India, West India and Central India. Slight adjustment might be necessary in North India and East India, but the differences are too small and too uncertain to support any definite figure as a correction factor.

A correction factor is, however, clearly needed in North-West India, in view of the findings about all crops in Rajasthan and as well as about wheat in the Punjab. It is suggested that an overall increase of North-West India yield-rates by 30 per cent might be assumed to be the correction indicated by the evidence. [This is roughly the mean between 10 per cent applicable to one half of the yield and 50 per cent applicable to another half of the yield in this zone. This is obviously little better than an *ad hoc* working hypothesis, to be revised on the basis of more refined data when available.] In the result, the official estimates of yield—set out in Table 3 in para 7 above—require to be increased by 435 lakhs of maunds of all foodgrains in North-West India, as well as the country as a whole.

13. We may now compute the total production of foodgrains (yield less seed) in absolute quantities; and by adding the assessed shortages from Table 1, we may also get the estimates of total consumption of foodgrains. From these, we may deduce the *average rate of production per acre, as well as consumption per capita*.

TABLE 4

Zone	Production (yield less seed)	Con- sumption	Rate of production (yield less seed) in maunds per acre	Rate of consum- ption per capita in maunds per annum
North India	104	106	6.6	4.6
East India	146	153	7.3	4.6
South India	96	106	8.2	3.8
West India	49	60	3.6	4.0
Central India	92	93	4.5	4.8
North-West India	69	71	6.2	5.0
INDIA	556	590*	6.0	4.5

The figures of Table 4 are about as far as we can get on the basis of 'official estimates' in our search for correct figures of 'production rates per acre' and 'consumption rates per capita'. The production rates per acre, it should be noted are *exclusive* of seed. The consumption rates *per capita* include in addition to actual human consumption, small and unknown additions on account of wastage and cattle feed also.

14: It must be pointed out that the figures of rates of consumption *per capita* set out in Table 4 do not agree with the figures published recently in the report on the 'First Round' of the National Sample Survey. According to Table (X) at page 78 of this report, the rate works out to 5.0 maunds for India against 4.5 in Table 4. The rates for the zones differ as follows: North-West India—6.9 against 5.0; North India—5.7 against 4.6; East India—5.1 against 4.6; South India—4.5 against 3.8; Central India—4.5 against 4.8; and West India—3.8 against 4.0.

The significance of these discrepancies is all the greater, because the lower rates are inclusive of waste and cattle feed, and the higher rates are exclusive of them. It is not impossible that the residual errors in official estimates both of acreage and yield rates tend to under-estimation of this order. It is also not unlikely that the direct estimates of consumption are overpitched.

*TABLE 1 shows 2.2 lakhs of tons of shortage, without zonal specification. Hence the discrepancy of one lakh tons which is taken into account in rounding up the zonal rates.

It is not possible to express any confident opinion as to which set of rates is nearer the truth. They help to indicate the limits within which the truth is most probably to be found. Even more important—they underline the need for forming a correct judgement about the extent of shortage of foodgrains independently on the basis of the actual experiences of so-called 'food controls'—our nationwide system of 'state trading' in foodgrains with the reliable statistics about supplies and prices which have accumulated by the operation of this system for nearly ten years. We should not be misled by the uncertainty which necessarily surrounds estimates of average yield rates and average rates of consumption.

PART B—Supply and prices of foodgrains

(i) Extract from the Indian Famine Commission Report, 1880

The quantity of grain and pulse exported touched its highest point in 1876-7, when it reached 26,210,000 cwts., and had fallen to 22,887,000 cwts. in 1878-9. The two chief items are rice and wheat. The export of rice has varied from 17½ million cwts., in 1874-5 (the year following the Bengal Famine) to 21¼ millions in 1878-9. The export to Europe amounts on the average to 11,600,000 cwts., that to Mauritius, the Cape and other colonies to 2,400,000 cwts., and the balance is taken by Arabia and Persia. Wheat reached its highest figure, 6½ million cwts., in 1877-8, and fell to one million cwts., in 1878-9, which is about the quantity exported in 1874-5 before the increase began.

* * * * *

[156] The following figures (though they are but approximate and rough estimates made from data which we hope soon to see more accurately established) indicate that the ordinary out-turn of food in British India exceeds 50 million tons, and the ordinary surplus available for storage, for export, or for the luxurious consumption of the richer classes is more than 5 million tons,

[Figures in Thousands]

Province	Population	Food Crop	Out-turn	Area under
		Area	of food	Non-food
		Acres	Tons	Acres
Punjab	17,600	18,500	5,330	2,500
N. W. Provinces and Oudh	41,000	31,450	11,230	5,200
Bengal	60,000	48,000	17,100	...
Central Provinces	8,200	12,000	2,750	2,500
Berar	2,250	3,700	620	2,800
Bombay	16,000	21,500	4,500	5,500
Madras	31,000	26,000	8,500	2,500
Mysore	5,000	5,100	1,500	500
Burma	...	...	...	..
TOTAL	181,350	166,250	51,530	21,500

ORDINARY CONSUMPTION

[Figures in Thousand Tons]

Province	Food	Seed	Cattle	Wastage	Total	Surplus
			Food			
Punjab	3,800	390	250	270	4,710	620
N. W. Provinces and Oudh	8,420	820	830	500	10,570	660
Bengal	13,000	1,000	1,000	900	15,900	1,200
Central Provinces	1,660	460	180	150	2,450	300
Berar	400	30	80	30	540	80
Bombay	3,300	290	260	210	4,150	350
Madras	6,300	400	440	420	7,560	940
Mysore	1,100	60	50	75	1,285	215
Burma	...	...	...	...	...	800
TOTAL	37,980	3,450	3,090	2,555	47,165	5,165

The figures in the last column show the estimated annual surplus from which the several provinces, if free from drought, could supply the deficiency in provinces suffering from famine. Experience indicates that the largest area with which we may have to deal in a single year is

not likely to exceed the tract affected in 1867-77, the total population of which was about 36 millions. It is estimated that in that year the crop in Bombay was short of the average by 1½ million tons, in Madras by 3½ millions, and in Mysore by 1 million tons; and the difference between this estimate of the out-turn in these provinces and the quantity required for a year's consumption at the ordinary rate is 4½ million tons. But the deficit actually to be met will be sensibly less than this amount. For a calamity of this kind immediately leads the population to reduce its ordinary rate of consumption both for men and cattle, and to guard more carefully against the waste that usually occurs. So far, too, as land remains unsown during the drought, something is saved in seed grain. From these causes the above stated deficit of 4½ million tons might be reduced to 3 millions. To meet this the local stocks, which there is reason to believe may commonly suffice for not less than three months consumption of the local population are first drawn upon, and as they begin to be depleted prices rise high enough to attract supplies from distant parts of the country. When the imports from without into a famine area are very large, as in the case of 1876-77, there is a corresponding rise of price and check of local consumption established in the exporting districts also; and thus, partly by enforced economy in these districts also, and partly by the contribution of their local surplus stocks, the pressure is spread over a wide extent of country in a greater or less degree. There would thus be available to meet the estimated deficit of 3 million tons, first, the local stocks of the distressed area, which, taken at three months' supply of the people's food, amount to 2¾ millions; second, the year's surplus of the districts not affected, which, by the figures in the above table would be 3½ million tons, but which might be expected to be larger in consequence of the diminished consumption; and third, the local stocks in those districts; and these three sources of supply, taken together, would appear to be quite sufficient to provide what was required. The yield per acre, on which the foregoing estimate is based, is derived from the local detailed reports and is so moderate that we have no doubt that it can be maintained, or may be readily increased; and it is important to observe that the surplus which we believe to be sufficient to meet the deficiency of food consequent on the severest drought on record, or likely to occur, does not exceed 6 per cent of the total present produce of the country.

We are unable to place confidence in the Table which shows an estimated annual surplus yield of five million tons of food grain. *The average annual export of rice and grain from all India is one million tons, which should thus leave four million tons to be laid by, a quantity sufficient to feed 24 millions of people.* As famines come but once in 12 years, there should in that period be an accumulated surplus sufficient to feed nearly 300 millions. And yet when famine does come, and then affecting at its worst not more than a tenth of that number, it is only by immense pressure on other parts of India, and at a quadrupled price, that the barest sufficiency of supplies can be obtained. This seems a clear proof that the alleged surplus must be greatly over-estimated. Considering, also, the admittedly "approximate and rough estimates" on which the belief in this surplus is based, and the exhausting practice of agriculture so generally followed in the cultivation of dry grain in India, we are unable to concur in the statement that "India as a whole now produces, and is likely long to produce, sufficient food for its population

in any season of drought". The "prolonged teachings of the past" referred to in the Report are, as far as that country is concerned, wholly against such a conclusion. Population is increasing, the price of food is rising, the production of it as shown by exports scarcely advances, whilst, as the number of the landless class who depend on wages is constantly growing, the supply of labour in the absence of industries other than agriculture must soon exceed the demand. Already their wages bear a less proportion to the price of food than in any country of which we have knowledge. The common price of grain in the Southern States of America on which the free black labourer is fed, is the same as that of the Indian labourer, *viz.*, 50 to 60 lbs. per rupee. But his wages are eight times that of the Indian, 2s. to 2s. 3d., against 3d. a day, whilst the climate is much the same in its demands for clothing and shelter. This is a fact of extreme gravity as illustrative of the poverty of the Indian-coolie or field labourer, not to be met by resting satisfied that "chronic famine is one of the diseases of the infancy of nations." For India as a nation has long passed its "infancy", and the task of the British Government is, by fostering diversity of occupation, to guard it against decline.

PART C—Estimates of rates of consumption of foodgrains

(i) Extracts from the Indian Famine Commission Report, 1880.

The conclusion we draw from a careful examination of the evidence of authorities in all parts of India is, that on an average a ration of about $1\frac{1}{2}$ lbs. per diem of the meal or flour of the common coarser grain of the country suffices for an ordinary working adult male. In the rice-eating countries an equal weight of rice may be accepted in lieu of flour, and in any case the ration should include a suitable proportion of pulse. A man doing light work would require about $1\frac{1}{2}$ lbs., and the ration which consists of 1 lb. of flour with a little pulse has been found sufficient to support life in numerous relief-houses, where no work is exacted, all over the country. On these basis the diet scale should be built up, it being understood that a female requires a little less than a male, a child below twelve years of age about half the allowances of an adult male, and a non-working child below six or seven about half as much as a working child. On relief works, however, where a money wage

is given, the rate of pay should be such as to leave a slight margin above the actual cost of the flour so as to allow for the purchase of salt, pepper, and other condiments and firewood and to avoid the risk of the wage being insufficient to purchase the full ration of food. Whenever it is necessary to supply people with a kind of food to which they are un-accustomed; the result should be carefully watched, and endeavour should be made to counteract, by some adjustment of the dietary, the unfavourable results which will probably arise from the change.

(ii) Extract from the Proceedings of the Government of India in the Revenue and Agricultural Department No. 35/33 dated Simla, the 24th August, 1893.

(Appendix II to the Indian Famine Commission Report, 1880).

The grain-equivalent of the minimum wage..... It is open to Local Governments either to prescribe the calculation of wages in the manner indicated by section 130 of the Provisional

Code or to adopt the alternative method, described in the last part of the preceding paragraph, subject to the following instructions.

The grain selected as a basis for calculation should in every case be the staple or staples in ordinary consumption in the affected tracts, and not the more expensive classes of grain which, though occasionally consumed in times of plenty, are abandoned for cheaper grains as soon as pressure sets in. *After a careful review of the statistics indicating the relations existing at various times in each Province between the price of the staple grain and the prices of other items of the ration, the Governor General in Council is satisfied that the cost of the other items in the minimum adult male ration will seldom, if ever, be found to be more than $\frac{1}{3}$ of the cost of the grain item.* The value of the minimum ration for an adult male will therefore be found to be fully represented by $1\frac{1}{2}$ lbs. of the grain or grains ordinarily consumed; and this estimate allows for a moderate 'margin' above a subsistence ration. The grain-equivalent of the ration thus estimated should not be exceeded in the rules of any Code without further reference to the supreme Government.

Wages in terms of the grain-equivalent expressed in pounds.

Taking the standard rate laid down in the preceding paragraph as a basis of calculation, the wages prescribed for the various classes of relief-workers are as follows:

ADULT MALES—

Maximum	{	Class A.—The money value of $2\frac{1}{2}$ lb. of grain
		Class B.—The money value of $2\frac{1}{2}$ lb. of grain
		Class C.—The money value of 2 lb. of grain
		Class D.—The money value of $1\frac{1}{2}$ lb. of grain
Minimum		All classes.—The money value of $1\frac{1}{2}$ lb. of grain.

ADULT FEMALES—

Maximum	{	Class A.—The money value of $2\frac{1}{2}$ lb. of grain
		Class B.—The money value of $2\frac{1}{4}$ lb. of grain
		Class C.—The money value of $1\frac{1}{2}$ lb. of grain
		Class D.—The money value of $1\frac{7}{16}$ lb. of grain
Minimum		All classes.—The money value of $1\frac{7}{16}$ lb. of grain

CHILDREN—

Wages or allowances for children will be determined on a consideration of their ages, their powers of work, and their requirements. *The wages or allowances should not be less than one-quarter or more than three-quarters of the wages allowed for adult males.*

(iii) Extracts from the Famine Inquiry Commission Report on Bengal, 1945.

[4.] *Rates of consumption of Cereals.*—(i) Standards (per adult and per capita)—The standard advised by the Government of India for purposes of rationing and generally followed throughout India, is one pound a day per adult. The standard adopted in the rationing of Calcutta is 4 seers per week per adult, equivalent to 19 ounces per day. These standards are not based on ascertained actual consumption. It is generally assumed that the consumption of 100 persons of all ages is equivalent to that of 80 adults. On this basis, the standard rates of per capita consumption are 80% of those of adult consumption.

(ii) *Actual off-take of Greater Calcutta under rationing.*—The average weekly off-take, on the basis of 22 weeks actuals, was 5,529 tons of rice and 3,562 tons of wheat and wheat-products, or 9,091 tons in all. The number of registered ration card holders in Greater Calcutta was 4.10 millions. Of these 3.36 millions are adults, 0.68 million are children entitled to a half ration, and the rest are infants not entitled to any cereal ration; in other words, the total in terms of adults is 3.70 millions. If these figures represent the actual population, then the actual average off-take would be as follows:

Average off-take	In seers per week	In ounces per day
Per adult	2.68	13
Per capita	2.41	11

But the number of registered ration cards cannot safely be assumed to be equivalent to the number of the total population, for the former include "dead cards" which, though registered are not used. The proportion of "dead cards" among those registered with Government stores is 16 per cent and it is believed that the proportion is smaller among cards registered elsewhere. Hence the actual average off-take is somewhere between the figures given above and those given

below which are obtained by multiplying the figures by 100/84.

Average off-take	In seers per week	In ounces per day
Per adult	3.20	15
Per capita	2.87	14

(iii) *Estimates furnished by Professor Mahalanobis Honorary Secretary, Indian Statistical Institute, Calcutta.*—Professor Mahalanobis has analysed the results of five different surveys conducted at different times between 1936 and 1942. Some of these were made at the instance of the Bengal Government and others were undertaken by the Indian Statistical Institute or the Viswabharati Institute of Rural Reconstruction. The following estimates, relating to the consumption of cereals, are based on his report:

Per capita consumption of all cereals	In seers per week	In ounces per day
General average rate for Bengal	3.58	17
Sectional average rates—		
(a) Rural population	3.65	17
(b) Calcutta middle classes	2.79	13
(c) Mofussil Urban middle classes	2.75	13
(d) Industrial working classes	3.47	16
(e) Families whose monthly expenditure is Rs. 10 or less	2.95	14

(NOTE.—The number of families whose monthly expenditure was Rs. 10 or less, was 3,212 as against a total of 15,409 families in the sample ; and the number of persons included in such families was 11,788, as against a total of 81,554 in the sample).

(iv) *Other estimates.*—Many other estimates have been made in the past which need not be referred to here. These were reviewed by the Foodgrains Procurement Committee appointed by the Bengal Government during 1944. This Committee drew attention to the wide divergence between the estimates, and concluded that the general average rate of consumption in the province as a whole was probably higher than 4 seers per week per adult. If this view is accepted, the per capita rate is not less than 3.20 seers per week or 15 ounces per day.

(v) *Conclusions.*—(a) **General average.**—The available data do not permit of conclusions being drawn with certainty. It is probable that

the true average rate is somewhere between the following limits:

Per capita consumption	In seers per week	In ounces per day
Lower limit	3.2	15
Upper limit	3.6	17

(b) **Sectional averages.**—The rate of consumption of cereals is higher in the villages than in the towns and cities and higher for the working classes than the middle classes.

(vi) *Under-nourishment.*—A low rate of cereal consumption does not necessarily mean under nourishment. The figures supplied by Professor Mahalanobis show that the relatively lower rates of cereal consumption of the urban middle classes are associated with relatively higher rates of consumption of protective and supplementary foods. But the figures for “families whose monthly expenditure is Rs. 10 or less” indicate a cereal consumption rate of 14 ounces per day with a very low rate of consumption of other foods. This class, which accounts for one-seventh of the total number, is probably under-nourished even in normal times. It is probable that the actual proportion of the population which is under-nourished in normal times is larger than one-seventh, but precise information on this point is not available.

[5.] *Direct Estimates of Annual Consumption.*—If, as mentioned already, the probable rate of consumption per head per week is anything between 3.2 seers and 3.6 seers, the probable annual consumption of a population of one million during one year might be anything between 153,000 tons and 172,000 tons. As the population of Bengal during 1941 was (according to the census) 60.3 millions, the probable annual consumption of the province may have been anything between 9.2 million tons and 10.4 million tons during 1941. The elements of uncertainty inherent in any estimate of total consumption of the province during any particular year include the following:

- (a) There is a range of error of over one million tons, arising out of the uncertainty about the average rate of consumption.
- (b) The population of Bengal during 1941 may have been less than the census figure of 60.3 millions. If the true figure was smaller by, as much as, say

3 millions, the figure of consumption would have to be reduced by nearly half a million tons.

- (c) An estimate of consumption for any earlier or later year depends on an allowance being made for the increase of population. This might, in view of the doubts mentioned already, be anything between 0.7 per cent per annum and 2 per cent per annum.
- (d) For the following reasons it cannot be assumed that an average rate of consumption per head remains constant over a series of years :
- (i) The proportion of the population which is under-nourished in normal times may be increasing. There is, however, no means of determining the effect of such a change on total consumption.
- (ii) The poorer classes in rural areas, whose standard of consumption is normally low probably reduce their consumption in lean years and increase it in years of good harvest. Likewise the urban poor increase their consumption in periods when the prevailing level of wages and employment rises more rapidly than the price of cereals, and decrease it when the opposite occurs. It is, however, not possible to make any satisfactory allowance for such variations, because neither the numbers of the classes whose consumption may vary for these reasons, nor the range of the variation is known.

It may thus be concluded that the information available is such that any estimate of the annual consumption of the province based on population statistics and an assumed average rate of individual consumption is likely to err by as much as 2 million tons—or about 25 per cent of the estimate. So wide a margin of error blocks this method of approach.

(iv) Extract from Draft Memorandum on Human Nutrition vis-a-vis Animal Nutrition in India.

(By the Nutrition Committee of the Indian Medical Research and the Animal Nutrition

Committee of the Indian Council of Agricultural Research, 1952.)

On the basis of utilising the maximum potentiality of cultivable acreage, adoption of scientific methods of increased crop production, and taking into cognisance certain barriers which can be overcome only in due course, we can expect to achieve the following modified target of human requirement within a reasonable period.

TABLE VI

A modified scale of human diet which can be achieved under the new plan.

Foodstuffs	Daily requirements in ozs.	
	Recomm- ended	Attainable
Cereals and Millets . . .	14	14
Gram and pulses . . .	3	3
Green leafy vegetables . . .	4	4
Root vegetables . . .	3	3
Other vegetables . . .	3	3
Fruits	3	3
Milk	10	(a) 10 oz, over what exists to-day, for 20 per cent of the population (i.e., the vulnerable group). (b) what exists to-day for the rest of the population.
Sugar and Jaggery . . .	2	2
Vegetable oil and Ghee . . .	2	1½
Meat	1	1 At present 55 per cent of population only.
Fish	Not considered	in the present plan.
Egg	1 No.	Not considered here.

(v) Consumption of Foodgrains per person per day

Surveyal	No. of sample households	Consumption per person per day	
		chhataks	ounces
I	2	3	4
URBAN			
Middle class			
1. Calcutta middle class : 1939	1,151	6.5	13.4
2. Bengal urban middle class : 1942	981	6.3	13.0
3. Calcutta middle class : 1945	610	6.7	13.8
4. Calcutta middle class : 1950-51.	774	6.4	13.2
Working class			
5. Jagaddal working class : 1941	641	8.6	17.7
6. Jagaddal working class : 1942	740	8.2	16.9
7. Jagaddal working class : 1945	755	6.8	14.0
RURAL			
8. Bengal Weaving Survey : 1936	9,038	8.4	17.3
9. West Bengal Bolpur Survey : 1936-37	659	7.0	14.4
10. NSS, West Bengal : 1949-50	181	8.4	17.3
11. Uttar Pradesh. 16 villages : 1948-49			
with conversion factor=0.80		10.2	21.0
with conversion factor=0.75		9.6	19.7
12. NSS, Uttar Pradesh : 1949-50	450	10.2	21.0
13. ICMR Diet Studies in 8 States : 1944-48	(61)*		
with conversion factor=0.80		8.4	17.3
with conversion factor=0.75		7.9	16.3
14. NSS average for these 8 States : 1949-50	1,881	8.3	17.1
15. NSS average, all India : 1949-50	3,177	8.9	18.3

*61 groups of studies covering 2,126 families altogether.

Survey Nos. 1, 2, 3, 5, 6 and 7 were carried out by the Indian Statistical Institute; no. 4 by the West Bengal State Statistical Bureau; no. 8 by the Bengal Board of Economic Enquiry (which had been set up by the Government of Bengal and was a quasi-governmental body); no. 9 by the Viswabharati Institute of Rural Reconstruction; no. 11 by the Government of Uttar Pradesh and no. 13 is based on diet studies made by Department of Public Health in various States.

Source: The National Sample Survey, General Report No. 1 on the First Round October 1950—March, 1951.

PART D

Import and Export of Food Grains in relation to India's Foreign Trade

(i) Extracts from the Indian Famine Commission Report, 1880.

Grain.—The quantity of grain and pulse exported touched its highest point in 1876-77, when it reached 26,210,000 cwts., and had fallen to 22,887,000 cwts., in 1878-79. The two chief items are rice and wheat. The export of rice has varied from 17½ million cwts., in 1874-75 (the year following the Bengal famine) to 21½ millions in 1878-79. The export to Europe amounts on the average to 11,600,000 cwts., that to Mauritius, the Cape, and other colonies to 2,400,000 cwts., and the balance is taken by Arabia and Persia. Wheat reached its highest figures, 6½ million cwts., in 1877-78, and fell to one million cwts., in 1878-9, which is about the quantity exported in 1874-75 before the increase began.

Comparison of Indian trade with that of England.—The trade of India at the present time approximates in its general amount to what that of Great Britain was between 1830 and 1840, but the difference that the Indian exports show a large excess over the imports, a condition of British trade which finally ceased about 1825, after which year imports began to prevail more and more, until at length they exceeded the exports by the enormous value of 150 or 160 millions sterling, though now the excess is somewhat less.

Excess of exports due to investment of capital and to cost of administration.—Supposing the values to be tolerably correctly recorded in the trade returns, which is believed to be the case, the excess of the value of exports over imports indicates the entire sum which India has to send to England to pay for all charges connected with the administration, the interest on English capital invested in India, and the profits of private trade and savings from salaries remitted by Englishmen, minus the new capital sent out from year to year for investment in the country. The period from 1854 to 1869 was the time when the capital for the guaranteed railways was being raised; about 110 millions were borrowed or raised in England 30 millions for the purposes of the Government, and 80 millions subscribed as railway capital for investment or expenditure in India, and there was hardly any surplus of exports at this time. In 1869 the construction of

guaranteed railways was coming to a close, and the system of construction by the State was beginning and from that time India, instead of drawing large sums of capital from England for investment, had to pay many millions a year as interest. The great rise in the export trade dates from that time, and for the last ten years the excess of exports has averaged about 16 millions sterling, of which perhaps half may be regarded as the return on capital invested in railways and commercial enterprise, and half as the charge on account of the administration of India by England which has to be met in England.

Imports into India.—The principal imports are cotton twist and piece goods, coal, liquors, and metals. The following table shows the average annual value for the last five years of such imports as exceed 500,000 in the year:

	£
Cotton twist and manufactures	18,895,000
Metals	3,265,000
Liquors	1,336,000
Coal	835,000
Sugar	819,000
Woollen goods	780,000
Railway plant and rolling stocks	757,000
Silk goods	747,000
Silk, raw	653,000
Apparel	565,000
Salt	556,000

Cotton goods.—The cotton goods imported are chiefly twist and piece goods. Of cotton twist, the average value has been about 2½ millions sterling; the import has shown no tendency to increase of late, the production of the coarser qualities by the Indian mills being very large. In piece goods the kinds called grey goods largely predominate; the average value for five years has been 10,460,000.

Metals.—Of the metals imported 80 per cent. is iron; and copper is the next most important item.

Liquors.—Under the head of liquors the imports whether of beer, spirits, or wines, show a tendency to decrease; the diminution in the case of beer being mainly due to the growing production of the hill breweries.

Silk.—About 2 million lbs. of silk, valued at 6½ million rupees, and about 7½ million yards

of pure and mixed silk goods, valued at nearly a rupee a yard, were imported from China and Japan.

Coal.—The use of English coal (of which on an average 460,000 tons were imported) is falling off in Bengal, where coal mining is largely developed, but is increasing in Bombay, where the cotton mills are creating a new demand for it, the deposits in Central India being too far off to supply it at a sufficiently low price.

Sugar.—Sugar comes mostly from Mauritius and China, and goes to Western India; the imports are fluctuating in amount; the export trade, chiefly from Bengal, is of almost equal value. This is an article which, if a little more skill were shown in its production and manufacture,

India could at least supply to meet its own wants.

Exports from India.—The average value during the last five years of principal articles exported from India has been as follows:

	£
Opium	12,175,000
Cotton, raw	11,515,000
Cotton, manufactured	905,000
Grain and pulse	7,963,000
Oil seeds	5,210,000
Jute, raw	3,201,000
Jute, manufactured	663,000
Hides	3,095,000
Indigo	2,973,000
Tea	2,579,000
Coffee	1,432,000
Wool	1,036,000

(ii) **Quinquennial Averages of Imports and Exports of Foodgrains in India.**

[Thousand Tons]

Year	Imports(—)	Exports(+)	Balance
1	2	3	4
1890-91—1894-95	—209.	+1,445	+1,236
1895-96—1899-1900	—482	+1,098	+616
1900-01—1904-05	—624	+1,663	+1,039
1905-06—1909-10	—959	+1,478	+519

Source : K. L. Datta : An Enquiry into the rise of prices in India, Vol. I.

1915-16—1919-20	—1,186	+1,587	+401
1920-21—1924-25	—1,135	+977	—158
1925-26—1929-30	—1,593	+828	—765
1930-31—1934-35	—1,843	+571	—1,272
1935-36—1939-40	—2,072	+686	—1,386

War Years

1940-41—1945-46	—808	+298	—510
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Source: Ministry of Food and Agriculture,
Directorate of Economics and Statistics.

Post-War Years :

(Calendar Years)

1947—1952	—3,272	...	—3,272
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Source : Planning Commission Report (Final).

(iii) (a)—Net Exports and Imports of Foodgrains into India—1891-92 to 1911-12.

[Thousand Tons]		[Thousand Tons]	
Year	Net Imports (+) Net Exports (-)	Year	Net Imports (+) Net Exports (-)
1	2	1	2
1891-92	-2,157	1902-03	-892
1892-93	-1,424	1903-04	-2,018
1893-94	-910	1904-05	-2,910
1894-95	-807	1905-06	-1,300
1895-96	-1,057	1906-07	-745
1896-97	-286	1907-08	-720
1897-98	-147	1908-09	+481
1898-99	-1,457	1909-10	-877
1899-1900	-399	1910-11	-1,659
1900-01	+609	1911-12	-2,994
1901-02	-250		

Source: K.L. Datta: An enquiry into the rise of prices in India, Vol. I.

(iii) (b).— Imports and Exports of Foodgrains into and from India.

Year	[Thousand Tons]		
	Imports	Exports	Net Imports (+) Net Exports (-)
1	2	3	4
Part I—(Undivided India including Burma)			
1890-91			
1891-92	12	2,557	-2,545
1892-93	26	3,319	-3,293
1893-94	15	2,245	-2,230
1894-95	24	2,164	-2,140
1895-96	15	2,383	-2,368
1896-97	53	1,591	-1,538
1897-98	54	1,544	-1,490
1898-99	3	3,071	-3,068
1899-1900			
1900-01	75	2,232	-2,157
1901-02	98	1,641	-1,543
1902-03	28	2,185	-2,157
1903-04	13	3,162	-3,149
1904-05			
1905-06	7	3,859	-3,852
1906-07	4	5,100	-5,096
1907-08	31	3,359	-3,328
1908-09	26	2,938	-2,912
1909-10			
1910-11	29	3,077	-3,048
1911-12	95	1,735	-1,640
1912-13	25	3,291	-3,266
1913-14	11	3,930	-3,919
1914-15			
1915-16	10	5,118	-5,108
1916-17	9	5,515	-5,506
1917-18	19	4,195	-4,176
Part II—(Undivided India excluding Burma)			
1914-15			
1915-16	1,283	1,434	-151
1916-17	1,318	1,470	-152
1917-18	1,056	1,682	-626
	567	2,953	-2,386

(iii) (b)—Imports and Exports of Foodgrains into and from India

[Thousand Tons]

Year	Imports	Exports	Net Imports (+) Net Exports (—)
I	2	3	4
Part II—(Un-divided India excluding Burma)—contd.			
1918-19	938	1,557	— 619
1919-20	2,049	274	+1,775
1920-21	1,292	611	+ 681
1921-22	1,744	422	+1,322
1922-23	965	783	+ 182
1923-24	839	611	+ 228
1924-25	834	2,457	—1,623
1925-26	1,228	875	+ 353
1926-27	928	766	+ 162
1927-28	1,927	1,009	+ 918
1928-29	2,219	885	+ 1,334
1929-30	1,662	603	+ 1,059
1930-31	1,409	765	+ 644
1931-32	1,592	618	+ 974
1932-33	1,341	520	+ 821
1933-34	2,089	466	+1,623
1934-35	2,782	488	+2,294
1935-36	2,215	422	+1,793
1936-37	1,965	720	+1,245
1937-38	1,596	966	+ 630
1938-39	1,872	828	+1,044
1939-40	2,714	493	+2,221
1940-41	1,519	556	+ 963
1941-42	1,202	770	+ 432
1942-43	86	378	— 292
1943-44 (a)	58	86	— 28
Part II (a)—On Government account (Un-divided India excluding Burma)			
1943-44(b)	326	...	+ 326
1944-45	726	...	+ 726
1945-46	931	...	+ 931
1946-47	2,578	...	+2,578
Part II (b)—On Government account (Un-divided India excluding Burma and Pakistan)			
1947-48*	2,656	...	+2,656
1948-49	3,047	...	+3,047
1949-50	2,861	...	+2,861
1950-51	2,720	...	+2,720

(a) For the period 1-4-43 to 31-8-43.

(b) For the period 1-9-43 to 31-3-44 only.

*For undivided India up to 14-4-47 and Indian Union thereafter. From 1-9-43, all imports of cereals on private account and export were banned.

NOTES:—Figures compiled by the Directorate of Economics and Statistics, Ministry of Food and Agriculture upon our request.

(ii) Foodgrains covered are rice, rice flour, wheat, wheat flour, jowar and bajra, gram, pulses and other sorts.

(iv) Index Number of Prices (1925-26 to 1929-30 as base)

<i>Quinquennial average prices</i>	<i>Quinquennium</i>	<i>Paddy (Madras 1800-1952)</i>
1	2	3
112	1800-01 to 1804-05	28.9
114	1805-06 to 1809-10	29.3
106	1810-11 to 1814-15	27.2
86	1815-16 to 1819-20	22.1
113	1820-21 to 1824-25	29.0
93	1825-26 to 1829-30	23.9
106	1830-31 to 1834-35	27.2
100	1835-36 to 1839-40	25.7
71	1840-41 to 1844-45	18.3
91	1845-46 to 1849-50	23.4
85	1850-51 to 1854-55	21.9
127	1855-56 to 1859-60	32.6
165	1860-61 to 1864-65	42.4
202	1865-66 to 1869-70	51.9
139	1870-71 to 1874-75	35.7
209	1875-76 to 1879-80	53.7
145	1880-81 to 1884-85	37.3
150	1885-86 to 1889-90	38.6
188	1890-91 to 1894-95	48.3
200	1895-96 to 1899-1900	51.4
198	1900-01 to 1904-05	50.9
266	1905-06 to 1909-10	68.4
280	1910-11 to 1914-15	72.0
361	1915-16 to 1919-20	92.8
423	1920-21 to 1924-25	108.7
389	1925-26 to 1929-30	100.0
221	1930-31 to 1934-35	56.8
223	1935-36 to 1939-40	57.3
436	1940-41 to 1944-45	112.0
817	1945-46 to 1949-50	210.0
1054	1950-51 to 1951-52	292.0

(6 months of 1952-53).

(iv) (a) Wholesale Prices of Rice, Wheat and Jowar at

Years	GOALPARA			PATNA			BOMBAY			NAGPUR		
	Rice (Common)	Rice [Balau No. 1(a)]	Wheat [Deshi Magahi (a)]	Rice- [Husked (b) Rangoon]	Wheat [Delhi No. 1 white peany]	Jowar- (Sholapuri (b))	Bajra [Ghati] (b)	Rice (Coarse Gurmatia)	Wheat (Medium)	Jowar (Boldi)		
1	2	3	4	5	6	7	8	9	10	11		
	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.		
1939	3 8 2	4 0 5	3 9 4	3 4 11	3 1 10	3 1 3	3 9 2	3 3 0	3 5 0	2 8 0		
1940	4 1 10	4 13 2	3 13 3	4 6 7	3 15 2	3 7 5	3 13 6	4 5 9	3 13 0	2 7 7		
1941	4 2 2	5 15 0	4 5 2	5 13 1	4 11 7	3 4 4	3 9 9	4 9 5	3 12 2	2 6 5		
1942	4 2 4	7 11 7	6 4 0	7 4 10	6 5 11	4 6 5	5 15 6	6 14 8	6 2 1	4 10 2		
1943	...	14 9 2	15 2 0	...	...	...	8 8 6	7 10 0	7 7 0	5 13 0
1944	...	13 12 0 (medium)	15 2 8	...	11 8 0	...	6 13 0	...	...	...
1945	11 11 0	11 11 10 (medium)	13 0 0	18 12 0	11 8 0	6 0 6	6 13 0	9 8 0*	9 10 2*	6 5 0*		
1946	12 1 4	12 1 4 (medium) s.t.	12 1 3	16 6 0	13 1 0	6 0 6	6 13 0	9 7 10*	10 2 6*	6 12 2*		
1947	13 11 5	13 0 0 (medium) s.t.	12 5 0	...	13 1 0	6 0 6	6 13 0	10 6 4*	13 7 0* (inferior)	6 15 5*		
1948	16 4 0	16 0 0 (medium) s.t.	12 0 0	18 12 0	13 1 0	7 7 5	8 3 11	14 14 8	18 0 8* (inferior)	10 15 4		
1949	18 13 3	9 8 0 (paddy) 22 0 0 s.t.	21 10 0	21 14 0	13 1 0	7 10 2	8 5 5	15 2 4	24 4 8	14 11 8		
1950	19 3 4	26 10 8	25 8 0	17 12 0	12 8 8	8 0 0	8 0 0	16 10 4	20 10 4	16 7 6		
1951	28 0 0	29 10 8	18 9 7	18 12 0	13 12 0 10 0 8 16 0 8	9 2 8 10 0 8 (Milo)	N.A.	22 12 4	24 14 9	17 13 10 (d)		

@ Retail Ration Rate
 (c) Controlled Rate
 (d) Yellow variety
 s.t. Statutory
 G Wholesale Government Issue price
 M Maximum wholesale selling price
 (f) Wholesale Ration Rate
 * Average Govt. wholesale selling price
 A. M. Average Maximum wholesale selling price
 (b) Ex-wholeseller

Selected Centres in Different Parts of the Country

[Prices in rupees per standard maund]

Years	KAKINADA		COIMBATORE		CUTTACK		AMRITSAR		KANPUR		HAPUR		CALCUTTA
	Rice (Sort II Purnasa)	Jowar	Bajra	Rice (Dhanki Mota)	Rice (Husked)	Wheat	Rice (Common)	Wheat (Medium Dara)	Wheat (Desi-soft Dara)	Rice (Ballan. No. 1. Shipment quality)			
	12	13	14	15	16	17	18	19	20	21			
	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.	Rs. As. Ps.
1939	...	...	...	2 12 1	3 6 10	2 10 11	4 13 2	3 7 4	2 15 6	4 10 6			
1940	4 9 7	2 9 9	2 15 0	3 11 10	4 1 0	3 4 10	4 6 6	3 12 8	3 3 3	4 13 11			
1941	4 12 4	2 9 3	2 14 8	4 6 1	5 15 9	3 12 4	5 15 8	4 6 1	3 11 9	6 4 0			
1942	5 9 9	3 13 2	4 3 0	5 2 7	7 12 5	5 1 0	9 7 7	6 14 7	5 1 5	8 4 2			
1943	8 4 9	10 11 5	11 5 2	11 6 11	14 5 7	10 14 8	16 15 9	12 7 6	11 9 1	19 0 0			
1944	7 14 1	11 1 2	...	9 0 0 ^{s.t.}	12 5 0	9 1 4	18 8 9	12 15 4	...	15 0 0 [@]			
1945	8 3 2	...	7 4 7	7 12 0 ^{s.t.} (common)	12 11 4	9 4 8	17 11 8	12 10 4	10 8 0	14 9 4 [@]			
1946	7 15 4	7 1 2	7 6 7	7 2 0 ^{s.t.} (common)	13 15 3	10 0 7	15 0 0 ^c	11 4 0 ^c	10 4 0 ^M	13 13 8 [@]			
1947	9 0 10	7 0 2	7 10 6	7 12 0 ^{s.t.} (common)	15 6 6	9 15 6	15 0 0 ^c	11 4 0 ^c	10 4 0 ^M	15 0 0 [@]			
1948	13 13 0	8 15 8	12 4 0	11 6 0 ^{s.t.} (common)	15 8 6 [@] (medium)	12 5 0	24 13 5 [@] (sale III)	13 1 0 [@]	21 11 8	16 5 4 [@]			
1949	13 2 8	7 13 3 ^M	7 15 3 ^M	11 6 0 ^{s.t.} (common)	19 11 3 [@]	14 8 0	24 9 0 [@] (sale III)	15 3 2 ^M	15 3 2 ^M	17 8 0 [@] (other than fine variety Retail)			
1950	12 4 9	10 12 7	9 13 11	13 7 2	19 3 7	12 10 0	22 1 1 ^{A.M.} (sale III)	15 4 7 ^{A.M.}	15 4 7 ^{A.M.}	16 2 0 ^(b)			
1951	13 3 0	11 7 3	9 12 11	15 6 7	17 15 3	13 4 3	14 15 0 ^(f) (sale III)	15 5 9 [@]	15 5 9 [@]	16 14 0 [@] (grade B)			
1952	...	...	...	...	...	...	...	...	...	17 8 0 [@]			

INDEX† NUMBER OF WHOLESALE PRICES

<i>Year</i>	<i>Rice</i>	<i>Wheat.</i>	<i>Jowar</i>
1	2	3	4
1939	115	132	101
1940	123	137	88
1941	159	167	91
1942	191	216	92
1943	589	339	189
1944	349	378	162
1945	330	372	167
1946	321	359	166
1947	334	375	185
1948	468	691	201
1949	494	635	274
1950	515	531	340
1951	544	549	297
1952	527	533	216

†1939 to 46 (Base : Week ended 19th August, 1939=100)
 1947 to 1952 (Base : Year ended August, 1939=100)

(iv) (b)—Index Numbers of Prices of Wheat in the United States, 1866 to 1951

<i>Wheat (U. S. A.)</i>		
<i>Year</i>	<i>Prices</i>	<i>Index No. of Prices (With 1926-30 as base)</i>
1	2	3
1866-75	124.6	122.3
1876-85	92.3	90.6
1886-95	67.7	66.4
1896-1900	65.7	64.5
1901-05	71.6	70.3
1906-10	87.3	85.7
1911-15	89.0	87.3
1916-20	193.0	189.4
1921-25	111.2	109.1

(iv) (b)—Index Numbers of Prices of Wheat in the United States, 1866 to 1951—contd.

Year	Wheat (U. S. A.)	
	Prices	Index No. of Prices (With 1926-30 as base)
1	2	3
1926-30	101.9	100.0
1931-35	60.0	58.9
1933	74.4	73.0
1934	84.8	83.2
1935	83.1	81.5
1936	102.5	100.6
1937	96.2	94.4
1938	56.2	55.2
1939	69.1	67.8
1940	68.2	66.9
	78.4	76.9
1941	94.4	92.6
1942	110.0	107.9
1943	136.0	133.5
1944	141.0	138.4
1945	150.0	147.2
	126.3	123.9
1946	191.0	187.4
1947	229.0	224.7
1948	199.0	195.3
1949	188.0	184.5
1950	200.0	196.3
	201.4	197.6
1951 (prel.)	212.0	208.0

(v) Export and import trade and balance of trade.

The two tables given on pages 318-319 were prepared by the Statistical Officer of the office of the Chief Controller of Imports and Exports, based on official figures of export and import trade. Both the tables relate to the following periods :

- (i) India with all countries including Pakistan during 1951-52.
- (ii) India with all countries including Pakistan—Average of the years 1948-49 to 1950-51.
- (iii) India-cum-Pakistan with all countries—Average of the years 1948-49 to 1950-51.
- (iv) Un-divided India with all countries—Average of the years 1938-39 to 1940-41.

2. Table (a) gives the Export Trade, Import Trade and balance of Trade in lakhs of Rupees. Table (b) gives them in terms of Thousands of Grain tons. The conversion factor applied for the various periods, which is based on the net import/export of wheat and rice (exclusive of paddy), is as follows :

Period 1951-52.	Rs. 495/1 per ton
Period 1948-49 to 1950-51	Rs. 418/7 per ton
Period 1938-39 to 1940-41	Rs. 86/8 per ton

3. The two tables give Commodity Categories and Classes. Annexure I to the tables gives the list of commodities which have been classified. Annexure II gives the classification of the commodities given in Annexure I into Categories and Classes.

Table (a)—Export and Import

Foreign Trade Commodity Categories and Classes	India's trade with all countries including Pakistan			India's trade with all countries including Pakistan		
	1951-52			Average of the years 1948-49 to 1950-51		
	Exports	Imports	Net Exports (+) Net Imports (-)	Exports	Imports	Net Exports (+) Net Imports (-)
I	2	3	4	5	6	7
Category A						
I. Grain, Pulses and Flour	...	23,030	-23,030	24	10,070	-10,046
II. Other Foodstuffs, Narcotics, and Beve- rages.	19,772	4,386	+15,386	14,177	3,779	+10,398
III. Seeds, Manures and Fodders, and other goods of vegetable or animal origin other- wise unclassified.	1,703	969	+734	1,702	1,431	+271
IV. Textiles, and made- up textile goods.	39,369	28,007	+11,362	28,514	15,670	+12,844
V. Leather, Leather pro- ducts and Rubber.	3,732	545	+3,187	3,014	451	+2,563
VI. Wood, woody mater- ials and their products	175	818	-643	114	630	-516
Total A	64,751	57,755	+6,996	47,545	32,031	+15,514
Category B						
I. Machinery and Mill work.	122	10,296	-10,174	74	9,125	-9,051
II. Vehicles	118	3,321	-3,203	73	2,724	-2,651
III. Construction and Engineering Stores.	258	160	+98	94	333	-239
IV. Metals and Metal Products otherwise unclassified.	2,441	7,266	-4,825	1,135	6,640	-5,505
V. Chemicals and Che- mical Products.	2,471	5,916	-3,445	1,536	3,792	-2,256
VI. Non-metallic Miner- als and their pro- ducts otherwise un- classified.	2,345	8,404	-6,059	1,399	5,211	-3,812
Total B	7,755	35,363	-27,608	4,311	27,825	-23,514

Trade in lakhs of Rupees

<i>Trade of India-cum-Pakistan</i>			<i>Trade of Undivided India</i>		
<i>Average of the years 1948-49 to 1950-51</i>			<i>Average of the years 1938-39 to 1940-41</i>		
<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (-)</i>	<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (-)</i>
8	9	10	11	12	13
4	9,816	-9,812	632	1,664	-1,032
12,818	3,373	+9,445	3,620	1,321	+2,299
1,686	1,040	+646	1,558	289	+1,269
36,114	13,841	+22,273	10,019	3,330	+6,689
3,274	343	+2,931	1,549	505	+1,044
78	615	-537	31	447	-416
53,974	29,028	+24,946	17,409	7,556	+9,853
48	9,927	-9,879	28	1,555	-1,527
70	3,295	-3,225	58	679	-621
84	252	-168	39	62	-23
1,023	7,439	-6,416	757	1,972	-1,215
1,350	4,378	-3,028	367	1,291	-924
1,109	5,721	-4,612	334	2,037	-1,703
3,684	31,012	-27,328	1,583	7,596	-6,013

Table (a)—Exports and Imports

Foreign Trade Commodity Categories and Classes	India's trade with all countries including Pakistan			India's trade with all countries including Pakistan		
	1951-52			Average of the years 1948-49 to 1950-51		
	Exports	Imports	Net Exports (+) Net Imports (-)	Exports	Imports	Net Exports (+) Net Imports (-)
1	2	3	4	5	6	7
Category C						
I. Paper and paper products, printing material, books and publications, and works of art.	381	1,937	-1,556	160	1,540	-1,380
II. Consumer goods otherwise unclassified	564	1,023	-459	362	842	-480
Total C	945	2,960	-2,015	522	2,382	-1,860
Category D						
Insufficiently described articles of Merchandise	783	527	+256	674	437	+237
Category E						
Treasure	163	4,425	-4,262	113	1,149	-1,036
Grand Total	74,397	101,030	-26,633	53,165	63,824	-10,659

Notes :—(1) Exports include re-exports.

(2) Above figures are for land, sea and air borne trade.

(3) As detailed statistics of Pakistan trade with countries other than India is not available, category D of India-cum-Pakistan trade is some what exaggerated and include all such items for which separate figures are not available.

(4) As Pakistan's land trade with Countries other than India though negligible is not available, it is not included in figures for trade of India-cum-Pakistan.

Trade in Lakhs of Rupees—contd.

<i>Trade of India-cum-Pakistan</i>			<i>Trade of un-divided India</i>		
<i>Average of the years 1948-49 to 1950-51</i>			<i>Average of the years 1938-39 to 1940-41</i>		
<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (-)</i>	<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (-)</i>
8	9	10	11	12	13
144	1,711	-1,567	55	524	-469
335	862	-527	307	505	-198
<u>479</u>	<u>2,573</u>	<u>-2,094</u>	<u>362</u>	<u>1,029</u>	<u>-667</u>
1,146	2,934	-1,788	104	52	+52
<u>113</u>	<u>1,149</u>	<u>-1,036</u>	<u>2,166</u>	<u>374</u>	<u>+1,792</u>
<u>59,396</u>	<u>66,696</u>	<u>-7,300</u>	<u>21,624</u>	<u>16,607</u>	<u>+5,017</u>

TABLE (b)—Exports and Imports Trade

Foreign Trade Commodity Categories and Classes	India's trade with all countries including Pakistan			India's trade with all countries including Pakistan		
	1951-52			Average of the year 1948-49 to 1950-51		
	Exports -	Imports	Net Exports (+) Net Imports (-)	Exports	Imports	Net Exports (+) Net Imports (-)
1	2	3	4	5	6	7
Category A						
I. Grain, Pulses and Flour	...	4,652	-4,652	6	2,405	-2,399
II. Other Foodstuffs, Narcotics, and Be- verages.	3,994	886	+3,108	3,386	903	+2,483
III. Seeds, Manures and Fodders, and other goods of vegetable or animal origin other- wise unclassified.	344	196	+148	406	341	+65
IV. Textiles, and made- up textile goods.	7,951	5,656	+2,295	6,810	3,743	+3,067
V. Leather, Leather pro- ducts and Rubber.	754	110	+644	720	108	+612
VI. Wood, woody ma- terials and their pro- ducts.	35	165	-130	27	150	-123
Total A	13,078	11,665	+1,413	11,355	7,650	+3,705
Category B						
I. Machinery and Mill work.	25	2,080	-2,955	18	2,180	-2,162
II. Vehicles	24	671	-647	18	651	-633
III. Construction and Engineering Stores.	52	32	+20	22	80	-58
IV. Metals and Metal Products otherwise unclassified.	493	1,468	-975	271	1,586	-1,315
V. Chemicals and Chemical Products.	499	1,195	-696	367	906	-539
VI. Non-metallic Miner- als and their pro- ducts otherwise un- classified.	474	1,697	-1,223	334	1,245	-911
Total B	1,567	7,143	-5,576	1,030	6,646	-5,616

Notes :—(i) Prices taken into account in calculation of grain tons are based on net export/imports of wheat and rice (excl. paddy) during the relevant periods i.e. (i) for the period 1951-52 Rs. 495.1 per ton (ii) for the period 1948-49 to 1950-51 Rs. 418.7 per ton and (iii) for the period 1938-39 to 1940-41 Rs. 86.8 per ton,

(2) Exports include re-exports.

(3) Above figures are for land, sea and air-borne trade.

in Thousands of Grain Tons

<i>Trade of India-cum-Pakistan</i>			<i>Trade of un-divided India</i>		
<i>Average of the year 1948-49 to 1950-51</i>			<i>Average of the year 1938-39 to 1940-41</i>		
<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (-)</i>	<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (-)</i>
8	9	10	11	12	13
1	2,344	-2,343	728	1,917	-1,189
3,061	806	+2,255	4,171	1,522	+2,649
403	248	+155	1,795	333	+1,462
8,625	3,306	+5,319	11,542	3,836	+7,706
782	82	+700	1,784	582	+1,202
19	146	-127	36	515	-479
12,891	6,932	+5,959	20,056	8,705	+11,351
12	2,371	-2,359	32	1,791	-1,759
17	787	-770	67	782	-715
20	60	-40	45	71	-26
244	1,777	-1,533	872	2,272	-1,400
322	1,046	-724	423	1,488	-1,065
265	1,366	-1,101	385	2,347	-1,962
880	7,407	-6,527	1,824	8,751	-6,927

(4) As detailed statistics of Pakistan trade with countries other than India is not available, category D of India-cum-Pakistan trade is somewhat exaggerated and include all such items for which separate figures are not available.

(5) As Pakistan's land trade with countries other than India though negligible—is not available, it is not included in figures for trade of India-cum-Pakistan.

TABLE (b)—Exports and Imports Trade

Foreign Trade Commodity Categories and Classes	India's trade with all countries including Pakistan			India's trade with all countries including Pakistan		
	1951-52			Average of the year 1948-49 to 1950-51		
	Exports	Imports	Net Exports (+) Net Imports (-)	Exports	Imports	Net Exports (+) Net Imports (-)
I	2	3	4	5	6	7
Category C						
I. Paper and paper products, printing material, books and publications and works of art.	77	391	-314	38	368	-330
II. Consumer goods otherwise unclassified.	114	207	-93	86	201	-115
Total C	<u>191</u>	<u>598</u>	<u>-407</u>	<u>124</u>	<u>569</u>	<u>-445</u>
Category D						
Insufficiently described articles of merchandise.	158	106	+52	161	104	+57
Category E						
Treasure	33	894	-861	27	274	-247
Grand Total	<u>15,027</u>	<u>20,406</u>	<u>-5,379</u>	<u>12,697</u>	<u>15,243</u>	<u>-2,546</u>

in Thousands of Grain Tons—concl.

<i>Trade of India-cum-Pakistan</i>			<i>Trade of un-divided India</i>		
<i>Average of the year 1948-49 to 1950-51</i>			<i>Average of the year 1938-39 to 1940-41</i>		
<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (-)</i>	<i>Exports</i>	<i>Imports</i>	<i>Net Exports (+) Net Imports (-)</i>
8	9	10	11	12	13
34	409	-375	63	603	-540
80	206	-126	354	582	-228
<u>114</u>	<u>615</u>	<u>-501</u>	<u>417</u>	<u>1,185</u>	<u>-768</u>
274	701	-427	120	60	+60
27	274	-247	2,495	431	+2,064
<u>14,186</u>	<u>15,929</u>	<u>-1,743</u>	<u>24,912</u>	<u>19,132</u>	<u>+5,780</u>

ANNEXURE I

List of Commodities

- | | | |
|---|---|--|
| 1. Animals, living | 41. Grain, Pulse and Flour | 81. Salt |
| 2. Apparel | 42. Graphite crucibles | 82. Seeds |
| 3. Arms, Ammunition and Military Stores | 43. Gums and Resins | 83. Shells and Cowries |
| 4. Art, Works of | 44. Hair | 84. Smoker's requisites |
| 5. Asbestos | 45. Hardware | 85. Soap |
| 6. Baskets and Basketware | 46. Hides and Skins, raw | 86. Specimens illustrative of natural science |
| 7. Belting for machinery | 47. Hops | 87. Spices |
| 8. Bobbins | 48. Horns, tips and pieces of horn | 88. Starch, Dextine and Farina |
| 9. Books, printed and printed matter | 49. Instruments, Appliances and parts thereof | 89. Stationery |
| 10. Boots and Shoes | 50. Ivory | 90. Sticks and whips |
| 11. Bristles and fibre for brushes and brooms | 51. Jewellery | 91. Stone and Marble |
| 12. Brushes and Brooms | 52. Lac | 92. Sugar |
| 13. Building and Engineering materials | 53. Leather | 93. Tallow and Stearine. |
| 14. Buttons | 54. Liquors | 94. Tea |
| 15. Candles of all kinds | 55. Machinery and Millwork. | 95. Tea-chests entire or in sections and parts thereof |
| 16. Canes and Rattans | 56. Manures | 96. Telegraphs, materials for construction and accessories |
| 17. Chalk, French | 57. Matches | 97. Telephones materials for construction and accessories |
| 18. Chemicals and chemical preparations | 58. Match making materials | 98. Textiles |
| 19. China clay | 59. Mats and mattings | 99. Tobacco |
| 20. Chinese and Japanese ware | 60. Metals and Ores | 100. Toilet requisites |
| 21. Clocks and Watches and parts thereof | 61. Mica | 101. Toys and requisites for games and sports |
| 22. Coal and Coke | 62. Oils | 102. Umbrella and umbrella fittings |
| 23. Coffee | 63. Oil Cakes | 103. Vehicles |
| 24. Coir | 64. Oil-cloth and Floor-cloth | 104. Wax of all kinds |
| 25. Coral | 65. Opium | 105. Wood and timber |
| 26. Cordage and Rope of vegetable fibre | 66. Packing, engine and boiler | 106. Postal articles not specified |
| 27. Cork Manufacture | 67. Paints and Painters' materials | 107. Articles imported as baggage |
| 28. Cutlery | 68. Paper and. Pasto board | 108. All other articles of merchandise |
| 29. Drugs and Medicines | 69. Paper making materials | 109. Bones for manufacturing purposes |
| 30. Dyeing and Tanning Substances | 70. Paraffin wax | 110. Casein |
| 31. Earthenware and Porcelain | 71. Perfumery | 111. Feathers |
| 32. Electroplated ware | 72. Pitch and Tar | 112. Fibre for brushes and brooms |
| 33. Fireworks | 73. Plants, living including Bulbs and Seeds for sowing | 113. Jadestone. |
| 34. Fish | 74. Plastic materials and Manufactures | 114. Kapok |
| 35. Fodder, Bran and Pollards | 75. Polishes | 115. Lacquer ware |
| 36. Fruits and vegetables | 76. Precious stones and Pearls, uncut | 116. Monazite |
| 37. Furniture and Cabinetware | 77. Printing and Lithographing machinery and material | 117. Tea Waste |
| 38. Gelatine | 78. Prints, Engravings and Pictures | |
| 39. Glass and Glassware | 79. Provisions and Oilman's stores | |
| 40. Glue | 80. Rubber | |

ANNEXURE II
Foreign Trade—Commodity Categories and Classes

Categories	Classes
<i>A</i>	I. Grain, Pulses and Flour 41
	II. Other Foodstuffs, Narcotics and Beverages 23, 34, 36, 54, 62 (Vegetable oils), 65, 79, 81, 87, 88, 92, 94, 99, 110, 117
	III. Seeds, Manures and Fodders and other goods of vegetable or animal origin otherwise unclassified 1, 35, 38, 40, 47, 56, 63, 70, 73, 82, 93, 104, 109, 111
	IV. Textiles, and made-up Textile Goods 11, 12, 24, 26, 44, 64, 98, 112, 114
	V. Leather, Leather Products and Rubber 10, 27, 46, 53, 80
	VI. Wood, woody materials and their products 6, 8, 16, 37, 58, 95, 105
<i>B</i>	I. Machinery and Millwork 7, 55, 66
	II. Vehicles 103
	III. Construction and Engineering Stores 13, 96, 97
	IV. Metals and Metal products otherwise unclassified 3, 28, 42, 45, 49, 60
	V. Chemicals and chemical products 15, 17, 18, 29, 30, 33, 43, 52, 57, 67, 72, 74, 75, 115
	VI. Non-metallic Minerals and products otherwise unclassified 5, 19, 22, 31, 39, 61, 62 (other than vegetable oils), 91, 116
<i>C</i>	I. Paper and paper products, printing material, books and publications and works of art 4, 9, 68, 69, 77, 78, 86, 89
	II. Consumer Goods otherwise unclassified 2, 14, 20, 21, 25, 32, 48, 50, 51, 71, 76, 83, 84, 85, 90, 100, 101, 102, 106, 107, 113
<i>D</i>	Insufficiently described articles of merchandise 108
<i>E</i>	Treasure

(vi) **Extracts from Reports of the Economic Commission for Asia & the Far East (1951 & 1952)**

RICE

Before the war, the region as a whole was more than self-sufficient in foodgrains, having a net export of over one million tons per year. Within this total picture, however, there were important deficit areas, notably : (1) China, India and Japan, countries of large population and having a greater degree of industrialization ; (2) Ceylon, Indonesia, Malaya and the Philippines, the mainly raw material export economies ; and (3) Hong Kong and Singapore, the entrepôts of the region. The deficiencies of these areas were in the pre-war years, largely made up by large imports from within the region. The pre-war surplus areas were (1) Burma, Indochina and Thailand, the major rice exporters and (2) Korea and Taiwan, rice exporters under Japanese control. The pre-war intra-regional trade of grains was thus predominantly in rice.

While the aggregate pre-war rice production of the surplus areas was only 18 per cent. of the regional total, these areas were responsible for more than 95 per cent. of the region's exports of rice. On the other hand, China, India and Japan, while producing some three-quarters of the region's rice, accounted for about 70 per cent. of the region's total imports and absorbed one-half of the total export of rice from the rest of the region.

After the war, there was some change in the deficit and surplus areas. The restitution of Taiwan and the North-East (Manchuria) made China at least potentially self-sufficient, while the partition left Pakistan with self-sufficiency or a small surplus in food production. On the other hand, India inherited most of the deficit areas of the sub-continent and Japan was deprived of all its colonial sources of supply. In 1951, the food deficits ranged from 5 per cent. of total supply in Indonesia, 10-12 per cent. in India and the Philippines, 21 per cent. in Japan, and 58 per cent. in the Federation of Malaya, to 75 per cent. in Ceylon. At the same time, the export availabilities within the region had greatly decreased, exports from the rice surplus areas of Burma, Thailand and the three states of Indochina being only half the pre-war volume. In Korea, the pre-war surplus was replaced by a

deficit. The decline in the region's exportable surplus was due both to decreased production and to increased consumption caused by population increases. On the mainland of China, however, there emerged an appreciable export availability.....

(ECAFE Report, Page 14)

.....Before the war, the region accounted for some 93 per cent. of the world production of rice. Its proportion of world consumption was somewhat less, owing to exports to countries outside the region. Rice accounted for about 50 per cent. of the region's total grain production in terms of tonnage and constituted the staple food of about two-thirds of the population. Since the end of the Second World War, there has been a persistent shortage of rice, and the region has depended upon imports from other parts of the world to supplement its own production. At the same time, its share in world production of rice has become somewhat smaller, owing to a significant increase in production on the American continent and in other areas.

Production.—In 1950/51 the world area under rice reached the record total of 94 million hectares but world production, estimated at 153 million tons in terms of paddy, showed a relatively small gain, while in Asia and the Far East there was a slight decrease. In 1951/52, the rice production of the world as a whole, as well as of the region, showed an increase over 1950/51.

Outside the region, rice production in 1951/52 recorded a substantial increase over the previous year in Europe and in the United States. These increases more than offset the short crops harvested in Egypt and Latin America. It may be noted, however, that rice production outside Asia and the Far East amounts to only 7 per cent. of the world total.

Trade.—World exports of rice, which totalled 4.3 million tons (cleaned basis) in 1950, are expected to show an increase in 1951. Estimates of exportable surpluses and available statistics of shipments from the major exporting areas suggest that the total quantity of rice entering international trade may have reached its post-war peak thus far in 1951 at a level of just over one-half of the pre-war average. The supplies exported during the year from the "rice bowl"

countries in South-East Asia—Burma, Thailand, Vietnam and Cambodia—are expected to be larger than in 1950 and may account for nearly three-fourths of the total world exports. Exports from Burma almost equalled those of Thailand and the combined shipments from these two major sources reached a post-war peak of almost 3 million tons. In recent years Cambodia and Vietnam exported only 10-20 per cent. of the pre-war average of 1.3 million tons.....

(*ECAFE Report 1951, page 23*)

TABLE 6
RICE PRODUCTION
(In Thousand Tons of Paddy)

	Pre-war (average)	1948-1950 (average)
British-Borneo	170	170**
Burma	6,971	5,219
Cambodia, Laos and Vietnam	6,498	4,583
Ceylon	340	306
China :		
Mainland	50,476	47,065
Taiwan	1,642	1,795**
India	34,182	33,608
Indonesia :		
Java and Madura	6,081	5,738†
Outer islands . . . . .	...	3,839†
Japan	11,501	11,976
Korea (south)	2,726	3,061
Malaya	513	637
Pakistan	11,169	12,580
Philippines	2,179	2,620
Thailand	4,357	6,767
REGIONAL TOTAL*	143,800	139,733

(*ECAFE Report 1951, page 24*)

TABLE 7
INTERNATIONAL TRADE IN RICE
(In Thousand Tons)

Exports from	1934-38 (average)	1948-50 (average)
Burma	3,064	1,209
Indo-china	1,317	139
Korea	1,158	8
Pakistan	393	35
Taiwan (China)	674	164
Thailand	1,388	1,170
Others	55	16
TOTAL	8,049	2,741

*Including others

** Average for 1949 & 1950 only.

† Average for 1948 & 1949 only.

Imports into	1934-38 (average)	1948-50 (average)
British Borneo	52	28
Ceylon	530	439
China	687	353
Hong Kong	176	121
India	1,883	708
Indonesia	261	232
Japan	1,732	280
Malaya	541	468
Philippines	35	79
Others	44	128
TOTAL	5,941	2,836

(*ECAFE Report 1951, page 25*)

TABLE 8
WHEAT AND COARSE GRAIN PRODUCTION
(In Million Tons)

	1934-38 (average)	1948-50 (average)
Wheat	34.8	34.8
Barley	12.7	12.4
Oats	1.2	1.0
Maize	14.6	15.1
TOTAL	63.3	63.2
Millet and Sorghums	36.5	33.2

(*ECAFE Report 1951, page 26*)

.....The lower post-war level of production in face of increased food requirements created a serious regional shortage. This deficiency was partially met by the change in the region's trade position from a net food-grain exporter of 1.5 million tons per annum in pre-war years to a net importer of 6.7 million tons per annum in recent years. Thanks to a gradually rising level of foodgrains imports, the total grain supply surpassed the pre-war level of some 199 million tons, in 1948/49, 1950/51 and 1951/52.....

(*ECAFE Report 1951, Page 9*)

TABLE 3
AVAILABLE SUPPLIES OF FOODGRAINS.

(Million Tons)

	1934/38	1948/49	1949/50	1950/51	1951/52
Rice					
Regional production—	100.6	99.6	98.2	97.5	98.3
Net import (+) or export (—)	* -2.1	+0.06	+0.3	-0.1	...
Available supply	98.5	99.7	98.5	97.4	98.3
Wheat					
Regional production	34.8	35.2	32.6	36.6	38.1
Net import	1.0	4.7	4.6	4.4	6.0
Available Supply	35.8	39.9	37.2	41.0	44.1
Coarse grains					
Regional production	65.0	62.7	61.0	61.3	63.5
Net import (+) or export (—)	-0.4	0.9	0.8	1.5	1.2
Available Supply	64.6	63.6	61.8	62.8	64.7
TOTAL GRAIN SUPPLY	198.9	203.2	197.5	201.2	207.1

* The trade in rice is for calendar year for the second half of the crop season shown, e.g., 1949 trade under 1948-49 crop season, etc.

.....The deficiency in grain supply was not evenly spread out in all parts of the region but was concentrated in India and some other deficit areas. In 1950/51, all countries for which data are available, except Japan and the Philippines, had a per capita consumption level which, in terms of calories, was lower than pre-war. There was, however, a general improvement in the year, as compared with 1949-50, except in India which suffered a serious decline, as shown in Table 4.....

(ECAFÉ Report 1951, page 10)

TABLE I-1
INDEX NUMBERS OF VOLUME OF TOTAL AND PER CAPITA CROP PRODUCTION (a)
(1934-38=100)

ECAFÉ region	1949/50	1950/51	1951/52
All crops	95	99	101
Food crops (b)	96	99	101
Non-food crops (c)	86	99	104
Population	112	112	113
Per capita, all crops	85	88	89
Per capita, food crops	86	88	90
ECAFÉ region excluding China.			
All crops	103	104	104
Food crops (b)	105	103	103
Non-food crops (c)	91	107	110
Population	118	119	120
Per capita, all crops	87	87	87
Per capita, food crops	89	87	86

Source : FAO

- (a). These index numbers are weighted by values. They are preliminary only. The figures include estimates for the mainland of China which are approximations since 1949-50.
(b). Food crops include cereals, sugar, root crops, pulses, edible oilseeds, tea, coffee and cocoa.
(c). Non-food crops include fibres, linseed, tobacco and rubber.

(ECAFÉ Report 1952, page 1)

Ceylon :

In 1951, three-quarters of Ceylon's food requirements had to be imported ; at the same time, rubber, tea and coconuts accounted for 91 per cent. of its export and 66 per cent. of its total crop area. In 1950 and 1951, the value of food imports amounted to some 50 per cent. of the total value of imports. Thanks to efforts towards self-sufficiency in accordance with the Six-Year Plan, rice production increased substantially in 1950/51, but was accompanied by a sizeable increase in imports. Nevertheless, both the production and total supply of rice remained below the pre-war level. This deficiency in rice supplies was more than made up by the increased use of imported wheat and flour, with a total grain and wheat flour supply some 12 per cent. above the pre-war level. In 1951/52 not only the production but also the import of rice declined to the 1949/50 level ; consequently, the grain supply was lower than in 1950-51 in spite of a further increase in wheat imports.

(ECAFÉ Report 1951, Pages 14-15)

India :

Both the long and short-term aspects of India's food problem have become increasingly urgent in the last few years. Before the war, the Indo-Pakistan sub-continent had an annual

foodgrains import of some 1.6 million tons, this being mostly rice from Burma. Since partition, India has inherited the pre-war deficit status in addition to the loss of some 0.8 million tons per year from former surplus areas which now are part of Pakistan.

India's foodgrain production has lagged behind population at an increasing rate. Between 1941 and 1951, while the population increased by some 13.4 per cent, grain production varied from 10 per cent. below to 7 per cent. above the 1938/39 level. In addition, there has been a persistent deterioration in yield per acre under rice since pre-war. Even in normal year, Indian production falls short of requirements by some 3 million tons at the 1950 ration standards. This is the long-term aspect of the country's food situation.

In the short term, the country suffered crop failures in 1950 and 1951 due to droughts, floods, insect pests and other adverse natural factors. In 1950/51, grain production declined by some 10 per cent. from the previous year's level which had been about the same as pre-war. For 1951/52, serious crop failures are again reported as a result of the succession of droughts, although total grain output may be slightly higher than in 1950/51. The curtailed production of cereals was only partly offset by large imports. In 1950/51 and 1951/52, total cereal supply fell short of that in 1948/49 by more than one million tons, while population increased by several million.

There has thus been a serious decline in the per capita supply and nutritional standard, from 310 lbs. per annum in pre-war years to 266 lbs. in 1949/50, 255 lbs. in 1950/51 and probably even lower in 1951/52. This was reflected in the basic daily ration, which was 12 ozs. per capita in 1951 and, for a short period, only 9 ozs., comparing very unfavourably with the target set by the Five-Year Plan, which upon realization would restore consumption to the pre-war level for the Indo-Pakistan sub-continent of some 16 ozs. per day for each adult.

Another short-term aspect of the food problem is the considerable variation in production between different areas which, together with transport shortages, has resulted in localized famines.

Government measures dealing with the food situation include rationing in selected areas, subsidies on imported foodgrains, the securing of large supplies from abroad, price control and various measures to promote an expansion of production.

One dilemma facing the country is that, while its greatest need is for rice, it has to purchase mainly wheat and coarse grains by reason of the limited export availability of rice overseas. India, like many other countries, has also been faced with the problem of relative prices favouring the cultivation of commercial and industrial crops in preference to food. The price situation began to change in the second half of 1951, but at the same time the negative balance of payments re-appeared and created a new set of difficulties for increasing food supply.

(ECAFÉ Report 1951, page 15-16)

Japan :

In contrast to the countries specializing in export agriculture, Japan is an industrialized country, which is also highly dependant upon imports for food supplies. In pre-war years, Japan's economy was integrated with the then colonial areas, notably Korea and Taiwan, which shipped a combined volume of 1.6 million tons of rice per year to the home islands. This was just sufficient to meet Japan's import requirements.

The situation changed radically after the war. The dissolution of its empire deprived Japan of its supplementary supplies, and the country had to look for other sources of food imports in addition to increasing its home production. In 1948, the rice harvest rose to a level 3 per cent. higher than the average of 1933-35 as a result of increased supplies of fertilizers and other agricultural requisites as well as favourable weather conditions. The planted area and production continued to increase, and in 1950, the rice harvest was 7 per cent. higher than pre-war. Meanwhile, wheat and other grains witnessed an even larger increase in yields, being, in 1950, 15 per cent. above pre-war. In 1951 as compared with the previous year, however, the rice crop sustained a decline of some 500,000

tons due to the unusually cool weather and typhoon, but the decline was largely offset by the consistent increase in the production of wheat and other grains resulting in a total indigenous cereal supply similar to that of the previous year.

In 1951, therefore, the maintained grain production, the increase in grain imports from 2.4 to 2.8 million tons, and the drawing of some half-million tons from the normal stock effected an increase of nearly one million tons in the availability for consumption as compared with the previous year.

The nutritional level, in terms of *per capita* consumption of calories, protein and fat, improved between 1946 and 1950, and further in 1951 although it was still below pre-war.

(*ECAFE Report 1951, pages 17-18*)

Burma :

Burma is highly dependent on rice for both employment and foreign exchange resources. Before the war, rice accounted for 70 per cent. of its cultivated acreage and some 50 per cent. of its exports. It was, at that time, the world's leading exporter of rice, with an annual volume of export equalling that of the next two largest exporters, Thailand and Indo-China, combined.

Rice acreage and production suffered a serious set-back in the years since the war, on account of the destruction and disruption caused by the war itself and subsequent internal disturbances. In 1945, production fell to a level sufficient only for internal needs, there being no exportable surplus. In 1948-49, acreage recovered to 81 per cent. and production to 72 per cent. of pre-war but there was a decline in yield. After a sharp fall in 1949/50 there was again an improvement in 1950/51 and 1951/52; but in 1951/52 both acreage and production were still some 13 per cent. below pre-war. Yield in 1950/51 had greatly recovered, being only slightly below pre-war levels. Among the difficulties in the way of recovery of rice production were the lack of work animals and the irregular transport services. Exports of rice also increased in 1951, to 1.3 million tons; they were, however, only 42.5 per cent. of the pre-war level.

Total retained supply was about 2.2 million tons of rice each year during the period 1949 to 1951, this being much higher than the pre-war

average of 1.7 million tons. As the population increased at a rate of only 0.6 per cent. per year during 1941-51, the *per capita* retained supply increased considerably.

(*ECAFE Report 1951, page 19-20*)

Indo-china :

Indo-china constitutes another major area of rice monoculture and surplus. Mainly due to internal disturbance, aggregate rice production of the three states, while declining sharply in the early post-war years, has been increasing recently, from about two-thirds of the pre-war volume in 1948-49 to 71 per cent. in 1949/50 and 74 per cent. in 1951/52. The average yield per acre reached the pre-war level in 1949/50 but subsequently declined. Total export was only 8 per cent. of pre-war in 1949, but recovered to 23 per cent. in 1951.

(*ECAFE Report 1951, page 20*)

Thailand :

Rice is the staple food and major export of Thailand, employing 80 per cent. of its population and contributing 60 per cent. of its exports.

Production of milled rice was 4.3 million tons in 1951/52, as compared with 4.4 million tons in each of the years 1950/51 and 1949/50, and 2.9 million tons before the war. Thus, although output in 1951-52 was 43 per cent. above pre-war, there had been some decline since the previous two years. The rice acreage in 1951-52 decreased substantially due to adverse weather conditions. The post-war yield per acre was below the pre-war level, probably as a result of less intensive methods of cultivation caused by labour shortage and, until recently, as a consequence of expanding acreage.

Export of rice has increased since 1949, when Thailand already held first place among rice exporters in the world. In 1950, the pre-war volume of export was surpassed by 7 per cent. and in 1951 by 12 per cent. reaching a total of 1.6 million tons.

(*ECAFE Report 1951, pages 20-21*)

China :

Production of foodgrains on the mainland of China continued to improve in 1950 and 1951

through expansion of acreage and improved yields resulting from irrigation, increased application of labour, fertilizers and insecticides, and in spite of a shortage of draught animals. Production in 1951, despite droughts, floods and insect pests, increased by some 7 per cent over 1950, although it was still 7 per cent below the pre-war level of 1936.

Before the war, the mainland of China used to have a large food import, averaging 687,000 tons of rice and 430,000 tons of wheat per year during 1934-38. Through improvement in transportation and distribution between surplus and deficit areas, there was a sizeable grain export in 1951, when 373,000 tons mostly of coarse grains were shipped to India.

With production at approximately the pre-war average level, but population increasing substantially and exports replacing imports, it would seem that the per capita supply in 1951 remained below pre-war, although it improved over the previous year.

Taiwan (China) is a rice surplus area which, before the war, exported some 650,000 tons annually. In 1951/52 rice production increased by about 3 per cent over 1950, and by 8 per cent over pre-war, partly at the expense of sugar cane acreage. The yield in 1951 increased

considerably over 1950 but was still only about 90 per cent of pre-war. There was, until 1951, a tendency for the retained supply to increase. Pre-war this was 526,000 tons. In 1950 it was 1,271,000 tons, declining, however, to 1,187,000 tons in 1951. Compared with pre-war there has also been an increase in per capita availability. How far this represents increased per capita consumption depends on changes in population and in stocks, details of which are not available.

(ECAFÉ Report 1951, page 21)

Pakistan :

The food position of the country is comparatively easy. In a normal year, Pakistan has a small surplus of 300,000-500,000 tons for export. Due to the relative abundance in supply, a policy of progressive derationing and decontrol of food grains was introduced in 1948/49 and rationing has been largely abolished in the current year. There were some deficit localities in West Pakistan, and a chronic deficiency in East Pakistan, which has to import from the western part of the country. Pakistan's main problem in food supply lies in the inadequacy of transport facilities, which handicap equitable distribution between deficit and surplus areas. Per capita consumption declined somewhat in 1950/51, owing to population increases and sizeable exports.

(ECAFÉ Report 1951, page 22)

PART E

Distribution of Food Grains—Government Responsibility

(i) Extract from the Indian Famine Commission Report 1880

...[153.] *Activity of private trade in India.*—We have no doubt that the true principle for the Government to adopt as its general rule of conduct in this matter is to leave the business of the supply and distribution of food to private trade, taking care that every possible facility is given for its free action, and that all obstacles material or fiscal are, as far as practicable, removed. The manner in which the demand for grain in Southern India in 1877 was met by supplies sent from the North showed the promptitude with which Indian trade will operate when the facilities for transport and the profit expected are adequate. The imports by sea into the distressed districts amounted, in the two years

1876-77 and 1877-78, to about 2 millions of tons*. The total quantity of grain carried on the railways in all parts of India was double this amount†, and the actual weight conveyed by them into the famine area may have been about 1 or 1½ millions of tons, in addition to the quantity brought by sea. If, as is hence probable, the total import in the year 1877 was 2 million tons, it would at the rate of 1 ton to 6 persons for a year have been sufficient for 12 million people, or one third of the whole population affected. These results were produced by the help of a system of railways, mostly single lines, and of which only one branch traversed the worst famine tract. It is only

	Tons.
*1876-77.....	760,000
1877-78	1,200,000
†1877	3,574,000
Half 1878.....	1,102,000

reasonable to anticipate that with every year's additional experience of the use to be made of the railways and telegraphs the activity and sensitiveness of Indian trade will continue to grow, and that with the new stimulus thus imparted to it, and the gradual extension of railways into districts where they do not yet exist, the power of meeting the wants of the population in time of local scarcity will be still further developed. Every interference by the Government with the operations of trade must be adverse to this tendency, and prejudicial to the growth of those habits of self-reliance which it is so essential for Government to encourage.

[154.] *Extension of railways.*—It is to the future extension of railways that we look as the most complete justification of our belief that the trade of the country may be confidently left to provide for the supply of food in times of scarcity. Such an extension has been going on for some years past, and it will, we trust, henceforth receive an additional impetus, as by the help of these works alone can the whole resources of the country be brought to bear in time of difficulty on any distressed area. The charge for transport between the most distant parts of India connected by rail does not now exceed one anna per seer, or $\frac{3}{4}$ d. per pound, and there is reason to hope that it may be reduced to a considerably smaller sum. At the present rate grain costing 24 seers per rupee or $\frac{1}{2}$ d. per pound could have been taken from Northern India to the famine districts in the south, and sold at 8 seers per rupee or $1\frac{1}{2}$ d. per pound, with a fair margin of profit. Such being the case we cannot doubt that with the growth of these means of communication and their continued use, all the requirements of every part of the country will be met by the natural operations of trade, without the necessity of any interference on the part of Government.

[155.] *Ability of the country to feed itself.*—A resolution to rely entirely on the ordinary operations of trade to meet the wants of the country in time of famine must unquestionably rest, not only on the expected activity of the traders, but also on the probability of the requisite supplies of food being forthcoming at the critical time. The question should therefore be answered, whether there is sufficient ground for believing that the quantity of grain likely to be needed to meet the wants of such large areas as may be stricken with famine in a single year will be

certainly forthcoming. We believe that there need be no apprehension as to such a provision being forthcoming in time of famine from the parts of the country not affected, though no doubt considerable pressure would be entailed on their inhabitants in proportion to the magnitude of the export. The quantity, though large in itself, bears but a moderate ratio to the whole produce of the districts in which it may be presumed, in accordance with prolonged experience there, will be no scarcity.

NOTE OF DISSENT BY JAMES CAIRD AND
H. E. SULLIVAN

...[9.] Although the principles laid down, in regard to the action of Government in relation to the food supply, have our general concurrence, the evidence which we collected has led us to form the opinion that, under present conditions, it might be not only expedient, but absolutely necessary, for the State to make provision in the manner condemned by our colleagues. There are certain localities in Southern, Western and Central India which are now, and may continue to be for some time, distant from the lines of railway communication, and which are in an especial degree liable to visitations of famine. For these comparatively inaccessible tracts, which we may reckon at one fifth part of India, with a population of 40 millions, we suggest a plan of storage to show that the measure is not the financial impossibility indicated in the Report and if our views as to its necessity be accepted, we recommend its being adopted tentatively on a limited scale, leaving the extension of the operation to be decided by the success or otherwise of the experiment.....

[10.] The food of two-thirds of the people of India is grain, and of one third rice. The annual surplus of rice, as shown by the export, is so great that a sufficient supply from the current crop can always be relied on to meet a partial rice famine. But the export of foodgrain other than rice from India, during each of the last ten years, has been less than one day's consumption of the grain-eating population. There would thus appear to be no sufficient annual surplus within the country to meet the demand of a severe grain famine, without drawing part of their ordinary food from the unaffected districts, thereby diminishing their supply, raising the

price, and thus extending the area and general pressure of the famine. This has been the uniform effect of drawing supplies suddenly to the famine districts from other parts of India. Supplies from foreign countries are practically impossible. The densely peopled countries of other parts of Asia do not appear to export grain. And in a country where the annual surplus of grain is so small and where it cannot be increased by foreign importation, the absolute need of reserves in seasons of scarcity, for the supply of places difficult of access, becomes almost imperative. The most effectual remedy for this would be to encourage the storage of grain in such localities in seasons of plenty.

[11.] No treatment of famine has yet been successful in the preservation of life that has not been ready to be commenced at the earliest period of actual want. The food of the people is of the simplest kind, grain and salt, and a few condiments for a relish. The grain is easy to handle, bears storage in pits for many years, and the people themselves grind it as they require it. The pits are made in the ground, in a manner with which the natives are familiar, and cost nothing beyond the encircling ring of baked clay, and labour, in construction. We propose no new practice, but recommend that, in outlying places, the Government should, through their resident officials, do for the safety of the poorer class what the wealthier now do for themselves. The people live on different varieties of dry grain grown in their several districts, which is the specific food they are accustomed to. As this common grain is rarely an article of export, its storage would in no way interfere with the operation of foreign trade, and as the storage would be sub-divided in every village it could be done without disturbance to the usual operations of husbandry. In seasons of abundance stores may very conveniently be made. A village of 400 inhabitants, cultivating 400 acres of grain, may be reckoned to have 40 of the class for whom storage is here proposed. A store of seven tons would suffice for this number during a year of famine, and as severe famines on an average come as yet but once in 11 or 12 years, the quantity so required might be secured out of two years of good crops during that interval, at the rate of $3\frac{1}{2}$ tons for each time, without any pressure on the rest of the people, while the storage of that quantity of grain would be a simple and inexpensive operation.....

(ii) **Extract from Famine Inquiry Commission Report on Bengal—1945**

....The initial phase of the disturbance in the rice markets in India was the direct result of the fall of Burma. Until then, the movement of rice prices had been more subdued than that of wheat prices, even though the relation between total supply and total demand was more unfavourable in the case of rice than in the case of wheat. As long as the possibility of imports from Burma remained, there was little speculative activity in the rice markets. When Burma fell and it became plain that the areas which were largely dependent on imports from Burma, must obtain their supplies in India and nowhere-else, prices of rice rose suddenly and alarmingly. This was mainly due to purchases in the rice producing areas for export to Western India, Travancore, Cochin and Ceylon, Western India, Travancore and Cochin were the areas in India which were most severely hit by the loss of imports from Burma. The figures also indicate the weight of the additional demand which the fall of Burma threw on markets in India, most of which were themselves somewhat short of supplies because of loss of imports from Burma. Unquestionably, the main factor in the disturbances in the rice markets in the summer of 1942 was the demand from areas which depended largely on imports from Burma.

Prices rose in the rice markets of India in the first instance because the need of the buyers from the areas to which we have referred was urgent and sellers in the principal markets could demand a higher price. The latter in their turn had to secure supplies from the secondary markets more quickly and in larger quantities than usual, in order to meet further demands from the outside buyers. The merchants in the secondary markets were then in a position to demand and obtain higher prices for their stocks. The rise in prices which was thus spreading could not be confined to the stocks which were purchased for export; it affected all transactions in the principal and secondary markets. It is necessary at this stage to emphasize the sharply contradictory character of the reaction of the markets to rising prices in different conditions. A rise of prices which is believed to be likely to continue, influences the minds of producers, traders, and consumers very differently from a rise of prices which is generally expected to be

temporary. In the latter case, sellers—both producers and traders—are anxious to sell before prices fall ; and buyers—both traders and consumers—reduce, so far as possible, the quantities they buy. Such a reaction automatically corrects the temporary mal-adjustment between the available market supply and the demand which caused the upward movement in prices. If the mal-adjustment is corrected by an increase in supply in the market and a reduction in demand, prices fall again. This does not, however, happen when the rise in prices is sharp and unusual, and is also expected to continue. In these circumstances, it produces an exactly opposite reaction in the minds of buyers and sellers. Buyers are anxious to buy before a further rise occurs and therefore increase their purchases, while sellers are reluctant to sell because they wait for still better prices. This further decreases the supply available in the markets and increases the demand on the diminishing supply. Prices move up still further in consequence. This reinforces the fears of buyers and the greed of sellers and intensifies the market disturbances. Given sufficient time for the psychology of greed and fear generated in this manner to penetrate, on the one hand, to the primary markets and the producers—the ultimate source of supply—and, on the other hand, to the retail shops and the consumers—the ultimate source of demand—prices may rise to such an extent that large sections of the population find themselves unable to buy.

There is, therefore, no quantitative relation between the movement of prices and the volume of the additional demand which initiated the movement. Unquestionably, the volume of imports which was lost as a result of the fall of Burma and had to be met from the principal rice producing areas of India was only a very small proportion of the total supply in these areas. Nevertheless, it was the diversion of the demand formerly met from Burma to the Indian markets which started the increase of prices in the summer of 1942. The extent of the rise was out of all proportion to the disturbing cause because of its repercussions on the local markets which we have described.....

Looking back, we have no doubt that in such conditions normal unrestricted trade operations could not ensure distribution at reasonable prices. A breakdown in distribution could be averted only by an intervention of Government,

which would have the effect of restoring public confidence and of demonstrating to producers and traders the determination and the ability of Government to prevent a further rise in prices, and of assuring traders and consumers that the flow of supplies would be maintained. We have also no doubt that it was this compelling necessity which led a number of Provincial and State Governments to undertake at about the same time a series of measures in restraint of trade. The measures which they adopted differed in several respects, but one measure was taken by all. Unusual exports were the original cause of the trouble. Control of exports was, therefore, the necessary first step in the attempt to control prices and ensure a satisfactory distribution of supplies. It was, however, only the first step. Other measures were necessary in order, first to deal with questions of price control and distribution within the province or state, and secondly, to ensure a flow of supplies from surplus provinces and states to deficit provinces and states.....

... The rise of prices, which we hold to be the second basic cause of the famine, was something more than the natural result of the shortage of supply which had occurred. It was the result of the belief of the producers, traders and consumers in Bengal at the end of 1942 and the beginning of 1943 that an ever-increasing rise in prices was inevitable and could not be prevented. This belief had been created, not only by the failure of the aman crop but by the entire course of events during 1942.

* * * * *

(iii) Extract from the Famine Inquiry Commission (Final) Report, 1945

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

(CHAPTER VI)

(i) The process of relaxation of existing controls is bound to present difficult problems which require to be studied in advance, and preparations for their solution must be made before they arise.

(ii) The return to normal conditions must be a gradual, regulated and co-ordinated process; otherwise the chaotic price and supply conditions which prevailed in many parts of the country in the summer of 1942 and during the greater part of 1943, may recur.

(iii) The permanent objectives of food policy have a bearing on the problems of the transition period and must be prominently kept in mind in considering these problems.

(iv) The organization during the transition period should be designed, not with a view to securing the most expeditions return to pre-war conditions, but so that it can evolve into a system of regulation of prices in normal times.

(v) The transition period may be regarded as commencing with the arrival of the first shipments of rice from Burma in appreciable quantities. Its probable duration is unpredictable; it may last until 1951-52.

(vi) During the first stage of the transition period, it should be possible to secure the diminution and eventual elimination of wide price disparities at present existing in different parts of the country.

(vii) If the actual price which prevailed during the quinquennium ending 1938-39 are worked out in each province, and a price in the neighbourhood of 240 per cent. of such average determined, the result would broadly represent the target price level to be aimed at the end of the first stage of the transition period.

(viii) Concurrently with the reduction of prices the more stringent forms of control should be withdrawn.

(ix) The main problem of the second stage of the transition would be the co-ordinated removal of cordons around provinces and states, and the re-transfer of the responsibility for distribution of supplies from Government agencies to the trade. At the same time Governments must be prepared to reintroduce controls should this be necessary, and to ensure the maintenance of the price level within pre-determined limits.

(x) Effective methods for preventing the price level from falling below a pre-determined minimum should be perfected at this time.

(xi) During this stage the price level should not be allowed to exceed 240 per cent of the pre-war level, that is, the average of the quinquennium ending 1938-39, nor allowed to fall below 180 per cent of the pre-war level.

(xii) The maintenance of the suggested minimum level during the stage of the transition

period is essential to the orderly development of the country's economy.

(xiii) It is only by setting before themselves in concrete terms a definite task to perform during the transition period, and actually solving the problems involved as they arise, that Governments will acquire the basis of practical experience on which a system of regulation of prices suitable for normal times can be devised and operated.

(iv) Extract from the Report of the American Famine Mission to India 1946

India, despite a crop shortage of seven million tons, has postponed famine for the first six months of the year. This was done by means of a highly successful system of rationing and enforced procurement of food grains from cultivators. Now a six month period confronts the Indian people during which they cannot avoid famine without imports since their supplies are being rapidly exhausted.....

No country in the world, with perhaps the exception of Russia, has gone so far in controlling basic food distribution—not even Germany under the Hitler dictatorship. As the shortages have become acute, in more and more areas monopoly procurement has been instituted. More and more of India's people have gone on rations. Lower and lower have fallen food allowances, reaching in some districts the starvation level of seven, six, even five ounces a day for adults.

The massive difficulties confronted by government can be appraised only by taking into account the fact that 60 percent of India's people are small cultivators clustered around India's 700,000 villages in which live 85 percent of the population ; *inadequate supplies, inadequate transport, widespread illiteracy have piled up the task to apparently impossible heights. Yet the job has been done. Popular provincial governments and skilled public administrators together have accomplished extraordinary results.* Taking due account of human weakness and selfishness, it was yet found that in nearly every area visited, achievements were far above expectations. Regretably the least that was being accomplished was found in the important province of Bengal.

These food controls, by their very efficiency, have squeezed both cultivator and consumer to the point where they are now forced to lean their whole weight on the system which their co-opera-

tion supports. If this rationing and procurement system collapses, they collapse with it. By levelling out the available food so that all might share equally in its consumption, famine pockets and early deaths were avoided. But by this spreading of the deficit, the danger of mass malnutrition and acute famine was also spread. Only by keeping stocks built up to ensure a continuous flow of food can disaster for many millions be avoided.....

These stocks can be maintained only by imports. There are not sufficient reserves among cultivators in India to avert mass starvation. Many millions of cultivators are themselves so short of food that they must draw from ration shops or starve, while it is true that enforced procurement has not cut down the food supply of cultivators as deeply in surplus areas as it has in the major deficit regions, further improvements in both procurement and rationing cannot keep the reserve up to the strength necessary for distribution.

To close the gap, India must obtain two million tons of food grains from abroad during the remainder of 1946. The greater part of this should reach India during August, September and October.....

(v) Extracts from Minute of Dissent in the Interim Report, Foodgrains Policy Committee 1947.

[3.] The most important, among the recommendations made by our colleagues runs as follows :

- (i) Acceptance of policy of reduction of Government commitments under rationing and controlled distribution.
- (ii) The beginning to be made with those rationing commitments which were accepted in recent years and reduction to be effected in the reverse order to the original process of extension.
- (iii) The basis of reduction to be decided with reference to local conditions with the definite aim of liquidating Government commitments as early as possible.

Our own recommendations are as follows :

- (i) No relaxation of any existing control over foodgrains during 1948.

- (ii) Relaxation of foodgrain control to begin as soon as possible, after supplies sufficient for honouring all commitments on 12 oz. basis, throughout the year, in all parts of the country are assured ; together with a margin for emergencies.

- (iii) Education of the public on foodgrains control policy ; and resolute enforcement.

[4.] The real issue is the question of control versus decontrol. The choice is now to be made between one of the three courses as indicated below :

- (i) Should decontrol of cereal foodgrains be begun and completed during 1948 ?

- (ii) Should decontrol be begun in 1948 and carried out in gradual stages subsequently ?

- (iii) Should the present controls be continued during 1948 ; and decontrol begun later and carried out in gradual stages subsequently ?

The recommendation made by our colleagues is so worded as to cover either the first or the second of the three courses mentioned above; and, as would be clear from the report, our colleagues are not agreed among themselves on this point. We for our part definitely recommend the third course.....

[5.] We do not share the view of our colleagues that these problems indicate that controls have failed. On the contrary they indicate, in our opinion, the intensity of the food shortage which has been prevailing during the last two years. On the basis of this view, we explain the reasons why, in our opinion, it is essential that controls should be continued during 1948.....

**CASE FOR CONTINUANCE OF CONTROL DURING 1948
[SECTION III]**

[1.] The problems which have arisen do not indicate that foodgrain controls have failed. They reflect merely the fact that the intensity of foodgrain shortage has been greater during 1946 and 1947 than in 1945, notwithstanding that import from abroad has increased.

[2.] This is seen from the following figures:

YIELD OF CEREALS (ALL INDIA)

(FIGURES IN LAKHS OF TONS)

Average 5 years ending	Jowar Total & (four from Rice Wheat Bajra cereals)			Difference from average
	Rice	Wheat	Bajra	
1943-44	282	106	112	500
1944-45	301	108	109	518
1945-46	284	92	88	464
1946-47	302	81	85	468

These figures show that whereas the crop which came in the market during 1945 was 18 lakhs tons better than the average of the preceding 5 years, the following two crops were smaller than the average by 36 lakhs tons and 32 lakhs tons respectively. The total short fall during the last year and this year was thus 68 lakhs tons. But the increase in imports (as compared with the average of the same five year period ending 1943-44) was only 21 lakhs tons.

[3.] The imports secured during the 1946 and 1947 are not abnormally heavy. The country as a whole is normally deficit in rice. Its rice deficit has been growing steadily for over a generation. It used to be surplus in wheat, and other foodgrains including pulses. But the surplus was steadily diminishing. The trend was such that by this time, if there had been no War, the rice deficit would have increased over the pre-war level and the surplus in other grains would have vanished. These facts are indicated by the following figures:

(LAKHS OF TONS)

Period	Net imports of rice and paddy	Net imports of all food-grains including pulses
(1) Average 5 years ending 1938-39	16	14
(2) Average 5 years ending 1933-34	11	10
(3) Average 5 years ending 1928-29	8	2
(4) Average 10 years ending 1923-24	7	...

[4.] Against the background of this past history of imports, the net imports into this country during the War and since have been as follows:

NET IMPORTS

(LAKHS OF TONS)

	Rice and Paddy	All grains
1939-40	21	22
1940-41	11	10
1941-42	7	4
1942-43	Minus 3 (Net export)	Minus 4 (Net export)
April 1943 to end of 1945	1	18
1946	3	22
First six months of 1947	3	12

[5.] These figures show why there was food shortage in 1945, in spite of a good All-India crop. From about the middle of 1941 to about the end of 1945, the country was being starved of imports which were normally necessary to balance internal production and consumption. Nevertheless, it was consuming more than it produced and imported. Except for the Bengal Famine, and occasional low rations in the South, there was no effective reduction of consumption as long as the one-pound ration was maintained. On the other hand, consumption actually increased because the population was increasing, higher prices enabled the poorer producers in rural areas to eat more and sell less, and the millions in the Army and War Industries had steadier employment and better wages and did not have to go hungry. The controls which were in operation simply enabled the country to draw upon its working stocks and hold on, with its 'carry-over' diminishing from year to year.

[6.] All would have been well, if increasing imports had coincided with good harvests. But instead, the poor crops of 1946 and 1947 visited the country when it was already holding a much smaller 'carry-over' than it used to in normal times. That is why no real comparison is possible between the food situation in 1946 and 1947 and the situation at any time during or before the War. The country as a whole and more particularly the South, which is normally deficit, is holding smaller 'carry-over' stocks than at any time before.

[7.] The next year (1948) may be expected to be somewhat better than 1947. But even if the crop is as good, the total supply position would

not be as good as in 1945, because of the very serious further depletion of stocks which has taken place since 1945. It will take time—about two years of good crops and good imports—for the carry-over to be rebuilt to the level of 1945. Therefore, the restoration of the one-pound ration of 1945 is not likely to be possible for another two years. If that is correct, there can be no question of there being a sufficiency of stocks during next year to go round to everyone without any restriction on purchases or on the scale of consumption—even assuming that imports of the same order as last year do materialise.

[8.] If this analysis is correct, and there is a real shortage in 1948, it would be extremely rash to relax controls and allow prices to rise. That controls were essential during the period 1942 to 1945, no one can seriously dispute. The Foodgrains Policy Committee of 1943, the Famine Inquiry Commission of 1944-45, and all the Governments were unanimous on this point. If controls were needed in 1945, they would be still more needed in 1948, because the supply position would be worse and the railway transport position not much better.

[9.] Free-trade in a market which is seriously short of grain and known to be short, must necessarily jeopardise the lives of the poor. The process by which this happens, has been explained by the FAMINE INQUIRY COMMISSION in the following terms:

“.....It is necessary to emphasize the sharply contradictory character of the reaction of the markets to rising prices in different conditions. A rise of prices which is believed to be likely to continue influences the minds of producers, traders, and consumers very differently from a rise of prices which is generally expected to be temporary. In the latter case, sellers—both producers and traders—are anxious to sell before prices fall, and buyers—both traders and consumers—reduce, so far as possible, the quantities they buy. Such a reaction automatically corrects the temporary mal-adjustment between the available market supply and the demand which caused the upward movement in prices. If the mal-adjustment is corrected by an increase in supply in the market and a reduction in demand, prices fall again. This does not, however, happen when the rise in prices is sharp and unusual, and is also expected to continue. In these circumstances, it produces an exactly opposite reaction in the minds of buyers and sellers. Buyers are anxious to buy before a further rise occurs and therefore increase their purchases, while sellers are reluctant to sell because they wait for still better prices. This further decreases the supply available in the markets and increases the demand on the diminishing supply. Prices move up still further in consequence. This reinforces the fears of buyers and

the greed of sellers and intensifies the market disturbances. Given sufficient time for the psychology of greed and fear generated in this manner to penetrate, on the one hand, to the primary markets and the producers—the ultimate source of supply—and, on the other hand, to the retail shops and the consumers—the ultimate source of demand—prices may rise to such an extent that large sections of the population find themselves unable to buy.....”

[10.] The hope that a run-away price of grain would increase the production of food, is likely to prove vain: The opposite might easily be the case. It will undoubtedly reduce consumption—but through a most dangerous method which might easily develop into uncontrollable famine,

[11.] Once such a development takes place, control will be lost in a few days and cannot be regained for months. In the conditions likely to prevail in the country during 1948, a run-away price of grain will involve not only famine, but food-riots and disorders also. If these consequences are conceded as at least probable, it would be necessary to weigh against them, the difficulties involved in facing and solving the problems which have arisen in food administration. These problems are undoubtedly serious; but they are by no means beyond solution.

[12.] *Procurement difficulties.*—The causes of procurement difficulties are known and have been detailed in Section II. What is now required is to increase the procurement prices in a reasonable manner and make available at fair prices, the commodities required by the producer, more particularly those which are necessary for increasing his production (e.g. manures, cattle-feed, implements, etc.). The mass of the producers in the country are reasonable people and desire only just treatment. They can be satisfied. The true hoarders and black-marketeters can then be isolated and dealt with according to their deserts.

[13.] *Rationing difficulties.*—If the above condition is fulfilled and imports of the order we have recommended are forthcoming, it should be possible to maintain steadily throughout next year a 10 oz. ration in seriously deficit areas, and a 12 oz. ration in other areas; and to increase the volume of stocks held by Governments at the end of 1948 as compared with the stocks held at present.

[14.] *Imports.*—The cost of imports is at present an exceedingly difficult problem; but

it is of a temporary nature. These excessive prices are not going to last for ever. Bad crops will not be repeated year after year, and will be succeeded by good ones. The recovery of war-ravaged areas is proceeding throughout the world, and presently the exportable surpluses are likely to increase, and the demands of deficit countries are likely to diminish. It may be reasonably anticipated that probably by 1950 (and almost certainly by 1951), the position would change, and grain-exporting countries would be more anxious to find buyers than grain-importing countries to find sellers. A break in prices is bound to come. In the meanwhile, the situation would be met by a reasonable ceiling on imports, and a really effective drive in the country to increase food production rapidly. *In any event, it is not possible to eat the cake and have it. If the lifting of controls is to be hastened, imports should be increased. If imports diminish, the controls must necessarily last longer. To choke-off*

imports and lift internal controls simultaneously would be to invite disaster.

[15.] *Unpopularity of controls.*—If it is true that the consequences of decontrol would be a run-away price of grain and disorders and famine, it is obvious that Government are not likely to be any more popular with decontrol than at present. Already there are sufficient indications that classes likely to be hit by decontrol are raising their voice against it. The only remedy would appear to be to educate the public on the true nature of the shortage prevailing, the indispensability in the common interest, of controlled behaviour on the part of all good citizens, and the need for genuine public co-operation in securing maximum production, maximum procurement, maximum efficiency in distribution and austerity in consumption. The food crisis is real. It must be faced and overcome by the united efforts of all the Governments and all the people.

(vi) (a)—Extract from Table No. 3 (Food Balance Sheet) of Bulletin on Food Statistics issued
 Figures for 1951 obtained separately

Name of population Zone and State	Procurement			Average 1949-51 Col. 2-4
	1949	1950	1951	
I	2	3	4	5
I—NORTH INDIA				
Uttar Pradesh	444	530	420	464.7
TOTAL	444	530	420	464.7
II—EAST INDIA				
Bihar	48	44	36	42.7
Orissa	168	116	85	123.0
West Bengal	437	473	426	445.3
Assam	173	149	65	129.0
Manipur				
Tripura				
Sikkim				
TOTAL	826	782	612	740.0
III—SOUTH INDIA				
Madras	1,408	1,109	940	1,152.3
Mysore	124	135	128	129.0
Travancore-Cochin	73	69	64	68.7
Coorg	14	9	10	11.0
TOTAL	1,619	1,322	1,142	1,361.0
IV—WEST INDIA				
Bombay	556	570	375	500.3
Saurashtra	15	105	55	58.3
Kutch	2	4	5	3.7
TOTAL	573	679	435	562.3
V—CENTRAL INDIA				
Madhya Pradesh	254	232	188	224.7
Madhya Bharat	123	165	144	144.0
Hyderabad	139	155	165	153.0
Bhopal				
Vindhya Pradesh	23	25	11	19.7
TOTAL	539	577	508	541.3
VI—NORTH-WEST INDIA				
Rajasthan	146	128	125	133.0
Punjab	328	436	300	354.7
PEPSU	106	158	68*	110.7
Jammu & Kashmir	29	11	35	25.0
Ajmer . . . . .	...	2	Negligible	2.0
Delhi . . . . .	...	...	...	...
Bilaspur . . . . .	...	...	...	...
Himachal Pradesh . . . . .	...	...	1	1.0
TOTAL	609	735	529	624.3
Bay Islands (Andaman & Nicobar) . . . . .	...	...	Negligible	...
Others . . . . .	...	9	13	11.0
GRAND TOTAL	4,610	4,634	3,659	4,301.0

* Exclude quantities not yet delivered to Government.

by the Economic & Statistical Adviser, Ministry of Agriculture (January, 1951).
from Ministry of Food & Agriculture.

(FIGURES IN THOUSAND TONS.)

Net Imports (+) or Net Exports (—)				Off Takes from Government Stocks			
1949	1950	1951	Average 1949-51 Cols. 6-8	1949	1950	1951	Average 1949-51 Cols. 10-12
6	7	8	9	10	11	12	13
+320	+11	+255	+195.3	631	651	692	658
<u>+320</u>	<u>+11</u>	<u>+255</u>	<u>+195.3</u>	<u>631</u>	<u>651</u>	<u>692</u>	<u>658</u>
+117	+136	+765	+339.3	165	201	630	332.0
—114	—95	—6	—71.7	40	44	82	55.3
+412	+306	+543	+420.3	814	860	955	876.3
+19	+14	+100	+44.3	183	163	165	170.4
<u>+434</u>	<u>+361</u>	<u>+1,402</u>	<u>+732.3</u>	<u>1,202</u>	<u>1,268</u>	<u>1,832</u>	<u>1,434.0</u>
+396	+588	+679	+554.3	1,825	1,808	1,490	1,707.7
+131	+91	+102	+108.0	244	236	221	233.7
+351	+297	+354	+334.0	403	401	416	406.6
—12	—9	—7	—9.3	...	2	3	2.5
<u>+866</u>	<u>+967</u>	<u>+1,128</u>	<u>+987.0</u>	<u>2,472</u>	<u>2,447</u>	<u>2,130</u>	<u>2,349.7</u>
+1,074	+722	+1,074	+956.7	1,456	1,477	1,380	1,437.7
+174	+14	+108	+98.7	162	157	152	157.0
+40	...	+11	+25.5	35	15	16	22.0
<u>+1,288</u>	<u>+736</u>	<u>+1,193</u>	<u>+1,072.3</u>	<u>1,653</u>	<u>1,649</u>	<u>1,548</u>	<u>1,616.7</u>
+34	—106	+62	—3.3	255	196	212	221.0
+25	—59	+13	—7.0	130	113	159	134.0
+100	+91	+120	+103.7	275	282	251	269.3
—17	—10	+3	—8.0	...	19	12	15.5
<u>+142</u>	<u>—84</u>	<u>+198</u>	<u>+85.3</u>	<u>660</u>	<u>610</u>	<u>634</u>	<u>634.7</u>
+90	+50	+53	+64.3	219	187	128	178.0
+64	—199	+23	—37.3	312	303	355	323.3
—104	—107	—33	—81.3	...	40	20	30.0
+53	+31	+11	+31.7	82	49	46	59.0
+38	+37	+37	+37.3	35	42	35	37.3
+214	+150	+188	+184.0	210	167	182	186.3
...
+5	...	+4	+4.5	5	...	5	5.0
<u>+360</u>	<u>—38</u>	<u>+283</u>	<u>+201.7</u>	<u>863</u>	<u>788</u>	<u>771</u>	<u>807.3</u>
+2	...	+2	+2.0	2	...	2	2.0
+207	+212	+200	+206.3	207	221	211	213.0
<u>+3,619</u>	<u>+2,165</u>	<u>+4,661</u>	<u>+3481.7</u>	<u>7,690</u>	<u>7,634</u>	<u>7,820</u>	<u>7,714.7</u>

(VI)-(b) -- Statistics of

Prepared from reports received upto 31-3-1951 in the Basic Plan, Branch II of the Ministry of Food and Agriculture
General's Office, Ministry of

Name of Population Zone and State	1951 Census population	No. of cities	City population	No. of towns	Town population	Village population	Population under statutory rationing		
							Urban		Rural
							No. of towns	Population	Population
I	2	3	4	5	6	7	8	9	10
I—NORTH INDIA									
Uttar Pradesh	63,216	16	3,908	486	4,718	54,590	51	6,868	...
TOTAL	63,216	16	3,908	486	4,718	54,590	51	6,868	...
II—EAST INDIA									
Bihar	40,226	5	857	108	1,848	37,521	1	256	...
Orissa	14,646	1	103	37	491	14,052	...	...	...
West Bengal	24,810	7	3,610	107	2,543	18,657	40	6,513	...
Assam	9,044	Nil	Nil	29	415	8,629	12	486	...
Manipur	578	Nil	Nil	1	3	575	...	...	...
Tripura†	639	Nil	Nil	1	43	596	...	...	...
Sikkim	138	Nil	Nil	1	3	135	...	...	...
TOTAL	90,081	13	4,570	284	5,346	80,165	53	7,255	...
III—SOUTH INDIA									
Madras	57,016	13	3,379	460	7,805	45,832	75	6,159	...
Mysore	9,075	3	1,182	107	997	6,896	4	1,374	...
Travancore-Cochin †	9,280	2	303	102	1,185	7,792	8	@	8,322
Coorg	229	Nil	Nil	2	16	213	...	...	...
TOTAL	75,600	18	4,864	671	10,003	60,733	87	7,533	8,322
IV—WEST INDIA									
Bombay	35,956	8	5,076	488	6,094	24,786	148	10,464	...
Saurashtra	4,137	3	374	78	1,019	2,744	3	432	...
Kutch	568	Nil	Nil	10	114	454	...	...	...
TOTAL	40,661	11	5,450	576	7,227	27,984	151	10,896	...
V—CENTRAL INDIA									
Madhya Pradesh	21,248	2	706	138	2,172	18,370	...	...	...
Madhya Bharat	7,954	3	682	64	759	6,513	2	372	...
Hyderabad (Provisional)	18,655	2	1,219	170	2,257	15,179	7	1,605	...
Bhopal	836	1	102	3	34	700	...	...	...
Vindhya Pradesh	3,575	Nil	Nil	64	306	3,269	...	...	...
TOTAL	52,268	8	2,709	439	5,528	44,031	9	1,977	...

rationed Population

(Food), Govt. of India—Population figures are in thousands. Arranged according to Zonal Divisions in Registrar Home Affairs on 4-4-1952.

Population under non-statutory rationing			Population served Relief Quota Shops|Fair Price Shops			Population under controlled distribution			Total population getting supplies from Govt.
Urban		Rural	Urban		Rural	Urban		Rural	
No. of towns	Population	Population	No. of towns	Population	Population	No. of towns	Population	Population	
11	12	13	14	15	16	17	18	19	20
...	...	...	11	445	...	...	...	...	7,313
...	...	...	11	445	...	...	...	...	7,313
...	...	...	...	@	20,636	...	...	...	20,892
17	416	...	...	...	...	...	...	...	416
42	@	3,868	...	...	...	...	...	...	10,381
...	...	...	...	...	...	25	@	1,215	1,761
NO RATIONING									
4. —Includes under controlled distributions						4	60	...	60
59	416	3,868	...	...	20,636	29	60	1,215	33,450
...	...	5,559	242	@	16,423	...	...	...	28,141
...	969	3,438	...	...	...	...	...	...	5,781
...	...	...	...	...	...	...	...	...	8,322
2	45	...	...	...	...	...	...	...	45
2	1,014	8,997	242	...	16,423	...	...	...	42,289
...	...	...	...	...	...	...	...	7,300	17,764
...	86*	482*	42	@	3,700*	...	...	...	4,132
4	86*	482*	...	...	...	...	...	...	568
4	86*	482*	42	...	3,700*	...	...	7,300	22,464
4	1,006	...	93	@	1,710*	...	...	...	2,716
4	570	...	93	@	2,481*	...	...	...	3,423
...	...	...	...	...	...	214	@	1,217	2,822
NO RATIONING NO RATIONING									
8	1,576	...	186	...	4,191*	214	...	1,217	8,961

(vi) (b)—Statistics of
(Prepared from reports received up to 31-3-1951 in the Basic Plan, Branch II of the Ministry of Food and Registrar General's Office,

Name of population Zone and State	1951 Census population	No. of cities	City population	No. of towns	Town population	Village population	Population under statutory rationing			
							Urban		Rural	
							No. of towns	Popula- tion	Popula- tion	
1	2	3	4	5	6	7	8	9	10	
VI—NORTH-WEST INDIA										
Rajasthan	15,291	3	589	215	2,061	12,641	...	...	...	...
Punjab	12,641	3	648	123	1,753	10,240	19	1,706	...	...
PEPSU	3,494	Nil	Nil	64	666	2,828	...	...	...	...
Jammu & Kashmir	4,410	...	...	...	...	...	2	322	...	...
Ajmer	693	1	196	6	101	396	3	321	...	...
Delhi	1,744	2	1,191	8	246	307	1	1,502	63	...
Bilaspur	126	...	...	1	4	122	...	...	...	...
Himachal Pradesh	983	...	...	10	41	942	...	...	...	...
Total	34,972††	9	2,624	427	4,872	27,476	25	3,851	63	...
Bay Islands (A&N)	31	Nil	Nil	1	8	23	1	12	5	...
GRAND TOTAL	356,829††	75	24,125	2,884	37,702	295,002	377	38,392	8,390	...

* Subject to revision.
 @ Urban Population is included in rural Population.
 †† Rationed Population figures are awaited.
 † Travancore-Cochin has statutory rationing through the State.
 ‡ Includes population under non-statutory rationing in Tripura.
 †† Jammu & Kashmir excluded here.

rationed population

Agriculture (Food), Govt. of India. Population figures are in thousands. Arranged according to Zonal Divisions in Ministry of Home Affairs on 4-4-1952.

Population under non-statutory rationing		Population served				Population under controlled distribution			Total population getting supplies from Govt.
Urban		Rural		Quota Shops|Fair Price Shops		Urban		Rural	
No. of towns	Population	Population	No. of towns	Population	Population	No. of towns	Population	Population	
11	12	13	14	15	16	17	18	19	20
...	...	...	...	...	...	46	1,635	1,962	3,597
...	...	...	115	@	3,553	8	154	...	5,413
45	508	...	...	...	...	...	...	...	508
22	11	...	...	...	...	...	...	...	322
...	...	...	...	...	100	...	...	...	421
...	...	...	...	...	123	...	...	...	1,688
NO RATIONING									
12	65	...	...	...	...	...	...	51	116
79	573	...	115	...	3,776	54	1,789	2,013	12,065
...	...	...	...	...	...	...	...	...	17
152	3,665	13,347	596	445	48,726	297	1,849	11,745	126,559
						No. of towns	Rationed Population (Urban & Rural)		
(a) Under Statutory Rationing.						377	46,782		
(b) Under Non-Statutory rationing.						152	17,012		
(c) Served through Relief Quota Shops.						596	49,171		
(d) Under Controlled Distribution.						297	13,594		
TOTAL						1,422	126,559		

APPENDIX VI
IRRIGATIVE PROJECTS AND IRRIGATIVE DEVELOPMENT PROJECT

APPENDIX VI

Old Irrigation Projects and Irrigation Development Projects

PART A—Irrigation development statistics

Introductory Note

TABLE I gives an abstract of the figures relating to the extent of irrigation development, cost of development of irrigation per acre, and return on capital outlay in projects in the First Five Year Plan and the earlier projects for India and the six zones. It will be seen from the table that four periods have been distinguished :

- (i) Pre-1891 ;
- (ii) 1891-1920 ;
- (iii) 1921-1940 ; and
- (iv) The period of the First Five Year Plan.

Broadly, the objective was to make this analysis for the same period as the analysis of population and cultivation (APPENDIX I, TABLES 1.6 to 1.8). A modification had to be made, however, in case of the period 1921-51. This period had to be divided into two parts— 1921-40 and the period of the First Five Year Plan. There were two main reasons for this :

- (i) During World War II practically no work was done on irrigation projects ; and
- (ii) It was felt that it would be desirable to treat the projects included in the First Five Year Plan (most of which had been started between 1947-51) as a single entity.

The figures upto 1941 relate to works in the former British provinces, because similar figures for the Indian States areas are not available. But figures for the Plan period, relate to works in the entire area of the zone. Thus, in case of South India, figures upto 1941, relate to works in the former province of Madras alone, but for the Plan period, they relate to works in Madras, Mysore, Travancore-Cochin and Coorg.

2. TABLES 2a to 2g give the data relating to important public irrigation works in the six zones of India and in Western Pakistan. The figures for these statements have been compiled from the publication— "Financial results of productive and unproductive, irrigation, navigation, embankment and drainage works for and upto the end of

1943" (published by the Government of India, Department of Labour). Details for all important projects have been given statewise and include the date of first coming into operation, the date of completion, the total cost of construction, the area irrigated, the average cost of development of irrigation per acre and financial returns.

For preparing the statement for North-West India (TABLE 2f) and for Western Pakistan (TABLE 2g) it was necessary to allocate the costs and benefits of the Punjab Canals, Upper Bari Doab Canal and Sutlej Valley Canals, between Indian Union and Pakistan as the area irrigated by them is partly in the Indian Union and partly in Pakistan. An *ad hoc* basis was adopted particularly for purposes of this review, as below :

In the case of the Upper Bari Doab Canal the allocation of both costs and benefits was done on a 50 : 50 basis ; but in the case of the Sutlej Valley Canals on the basis of one-third of costs and benefits to India and two thirds to Pakistan. The problem did not arise in the case of the other canals as the areas irrigated are either entirely in India or in Pakistan.

3. TABLE 3 gives similar details, as far as available, for the important projects included in the First Five Year Plan, also statewise and zone-wise. TABLE 4 gives similar data for the minor irrigation projects of the First Five Year Plan. The figures for these two statements have been taken from the reports of the Planning Commission.

4. It is important to note that the figures of capital outlay furnished in TABLES 3 and 4 are only estimates, while the figures of TABLES 1 and 2 are ascertained actuals. Some of the estimates are under revision and the actuals will not be ascertainable for some years. In respect of certain multi-purpose projects it was necessary to make allowance for power etc., benefit before determining the cost attributable to irrigation only. This has been done on an *ad hoc* basis and should be regarded as purely tentative.

**Table I—Old Irrigation Projects and Major & Minor
(Abstract Statement)**

Zone	<i>Total Capital Outlay (Direct* & Indirect), (Rs. Lakhs)</i>	<i>Area irrigated* (000' acres)</i>	<i>Cost per acre of area irrigated Rs. (Col. 2/3)</i>	
1	2	3	4	
I—North India				
Old Irrigation Projects (for which Capital and Revenue accounts are maintained)	Before 1891	1081.94	3250.0	33.29
	1891-1920	311.46	505.0	61.68
	1921-1940	1290.61	1816.0	71.07
	TOTAL Pre 1891—1940	2684.01	5571.0	48.18
Major Irrigation Development Plan Projects	2205.00	1954.0	112.85	
Minor Irrigation Plan Projects	480.00	1110.0	43.24	
II—East India				
Old Irrigation Projects (for which Capital and Revenue accounts are maintained)	Before 1891	268.43	510.0	52.63
	1891-1920	634.30	709.0	90.61
	1921-1940 . . . . .	...	...	...
	TOTAL Pre 1891—1940	902.73	1210.0	74.61
Major Irrigation Development Plan Projects	12466.00	5503.0	226.5	
Minor Irrigation Plan Projects	1174.00†	4225.0	30.97†	
III—South India				
Old Irrigation Projects (for which Capital and Revenue accounts are maintained)	Before 1891	600.58	1264.5	47.50
	1891-1920	576.53	1311.9	43.95
	1921-1940	759.23	243.0	312.44
	TOTAL Pre 1891—1940	1936.34	2819.4	68.68
Major Irrigation Development Plan Projects	8279.00	1026.0	806.92	
Minor Irrigation Plan Projects	1426.00	763.0	186.89	
IV—West India				
Old Irrigation Projects (for which Capital and Revenue accounts are maintained)	Before 1891	175.87	72.7	241.91
	1891-1920	330.07	160.1	206.16
	1921-1940	564.32	147.3	383.11
	TOTAL Pre 1891—1940	1070.26	380.1	281.57
Major Irrigation Development Plan Projects	3458.00	1051.0	329.02	
Minor Irrigation Plan Projects	835.00	797.0	104.77	

* Figures relate to 1942-43.

† Excluding Orissa for which cost of minor irrigation is not available, but the figures of area irrigated are known and have been included.

**Irrigation Development Plan Projects
for India by Zones)**

<i>Accumulated interest arrears (Rs. Lakhs)</i>	<i>Accumulated surplus revenue (Rs. Lakhs)</i>	<i>Total sum at charge (Rs. Lakhs)</i>	<i>Net revenue* (Rs. Lakhs)</i>	<i>Percentage return on total capital outlay (Col. 8/2)</i>
5	6	7	8	9
...	2826.49	1081.94	141.30	13.06
331.68	10.85	643.39	6.28	2.02
711.10	0.10	2001.70	43.62	3.38
<u>1042.78</u>	<u>2837.44</u>	<u>3727.03</u>	<u>191.20</u>	<u>7.12</u>
12.34	...	280.57	17.84	6.65
1035.70	...	1670.02	4.62	0.73
...
<u>1048.04</u>	<u>...</u>	<u>1950.59</u>	<u>22.46</u>	<u>2.49</u>
457.98	2140.62	1058.57	55.48	9.24
93.66	1503.52	670.19	53.25	9.24
393.31	...	1152.53	19.24	2.53
<u>944.95</u>	<u>3644.14</u>	<u>2881.29</u>	<u>127.97</u>	<u>66.1</u>
164.67	5.71	340.50	7.31	4.16
149.49	...	479.59	14.00	4.24
499.50	0.14	1063.82	15.64	2.77
<u>813.66</u>	<u>5.85</u>	<u>1883.91</u>	<u>36.95</u>	<u>3.45</u>

Table 1—Old Irrigation Projects and Major & Minor

Zone		Total capital ou lay (Direct & Indirect) (Rs. Lakhs)	Area irrigated* (000' Acres)	Cost per acre of area irrigated Rs. (Col. 2/3)
1		2	3	4
V—Central India				
Old irrigation Projects (for which Capital and Revenue accounts are maintained)	Before 1891 . . .	...	...	...
	1891-1920 . . .	79.77	69.3	115.11
	1921-1940 . . .	570.63	593.0	96.23
TOTAL Pre 1891—1940		<u>650.40</u>	<u>662.3</u>	<u>98.20</u>
Major Irrigation Development Plan Projects		4134.00	1067.0	387.44
Minor Irrigation Plan Projects		639.00	524.0	121.95
VI—North-West India				
Old Irrigation Projects (for which Capital and Revenue accounts are maintained)	Before 1891 . . .	377.30	2745.9	13.74
	1891-1920 . . .	204.38	914.9	22.34
	1921-1940 . . .	295.64	636.5	46.45
TOTAL Pre 1891—1940		<u>877.32</u>	<u>4297.3</u>	<u>20.42</u>
Major Irrigation Development Plan Projects		13950.00	5492.0	254.01
Minor Irrigation Plan Projects		121.00†	857.0	15.63†
INDIA				
Old Irrigation Projects (for which Capital and Revenue accounts are maintained)	Before 1891 . . .	2504.12	7843.1	31.93
	1891-1920 . . .	2136.51	3661.2	58.36
	1921-1940 . . .	3480.43	3435.8	101.30
TOTAL Pre 1891—1940		<u>8121.06</u>	<u>14940.1</u>	<u>54.36</u>
Major Irrigation Development Plan Projects		44492.00	16093.0*	276.47
Minor Irrigation Plan Projects		4675.00††	8276.0	60.25††
Supplementary Schemes (Minor)		3000.00	3000.0	100.00
TOTAL		<u>52167.00††</u>	<u>27369.0</u>	<u>194.28††</u>
Pakistan : before partition				
Old Irrigation Projects (for which Capital and Revenue accounts are maintained.)	Before 1891 . . .	374.63	2560.5	14.63
	1891-1920 . . .	2091.98	6475.2	32.31
	1921-1940 . . .	3583.24	5140.5	69.71
TOTAL Pre 1891—1940		<u>6049.85</u>	<u>14176.2</u>	<u>42.68</u>

*Figures relate to 1942-43.

†Excluding Himachal Pradesh for which cost of minor irrigation is not available ; but the figures of area irrigated are known and have been included.

††Excluding Minor irrigation Plan Projects in Himachal Pradesh & Orissa both, for which cost of minor irrigation is not available.

Irrigation Development Plan Projects—concl'd.

<i>Accumulated interest arrears (Rs. Lakhs)</i>	<i>Accumulated surplus revenue (Rs. Lakhs)</i>	<i>Total sum at charge (Rs. Lakhs)</i>	<i>Net revenue* (Rs. Lakhs)</i>	<i>Percentage return on total capital outlay (Col. 8/2)</i>
5	6	7	8	9
...
...	...	79.77	0.67	0.84
...	...	570.63	5.04	0.88
...	...	650.40	5.71	0.88
...	1635.66	377.30	69.25	18.35
8.90	934.56	213.28	26.91	13.17
...	20.58	295.64	29.46	9.96
8.90	2590.80	886.22	125.62	14.32
634.99	6608.48	3138.88	291.18	11.63
1619.43	2448.93	3756.24	105.73	4.95
1603.91	20.82	5084.32	113.00	3.25
3858.33	9078.23	11979.44	509.91	6.28
49.65	1314.21	424.28	55.45	14.80
493.46	7852.64	2585.43	409.05	19.55
86.07	115.86	4450.31	207.07	5.78
629.18	9282.71	7460.02	671.57	11.10

TABLE 2(a)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs. Lakhs)	Area irrigated* (000' Acres)
1	2	3	4	5
UTTAR PRADESH				
Before 1891				
PRODUCTIVE WORKS				
Upper Ganges Canal	31-3-1891	1855-56	449.04	1450
Lower Ganges Canal	31-3-1891	1879-80	420.93	1047
Eastern Jumna Canal	31-3-1891	Prior to 1830-31	61.23	358
Agra Canal	31-3-1891	1874-75	123.87	378
TOTAL			<u>1055.07</u>	<u>3233</u>
UNPRODUCTIVE WORKS				
Dun Canals	31-3-1891	Prior to 1840-41	26.87	17
TOTAL			<u>26.87</u>	<u>17</u>
Period total before 1891				
(Productive & Unproductive).				
TOTAL			<u>1081.94</u>	<u>3250</u>
1891—1900				
PRODUCTIVE WORKS				
Bijnor Canal	31-3-1894	Prior to 1886-87	6.03	20
TOTAL			<u>6.03</u>	<u>20</u>
UNPRODUCTIVE WORKS				
Rohilkhand Canals	31-3-1894	1893-94	23.31	25
Betwa Canals	31-3-1893	1886-87	86.52	168
Lakes & Tanks in Jhansi District	31-3-1894	1893-94	2.10	6
Lakes & Tanks in Hamirpur District	31-3-1894	1893-94	1.62	2
TOTAL			<u>113.55</u>	<u>201</u>
1901—1910				
UNPRODUCTIVE WORKS				
Ken Canal	31-3-1909	1908-09	62.68	133
TOTAL			<u>62.68</u>	<u>133</u>
1911—1920				
UNPRODUCTIVE WORKS				
Dhasan Canal	31-3-1911	1911—12	50.61	64
Siaori Lake	31-3-1912	1911—12	1.86	4
Garai & Ghagar Canals	31-3-1918	1916—17	51.80	64
Pahuj & Garhmanu Canals	31-3-1917	1911—12	8.48	8
Majhgawan Tank	31-3-1917	1915—16	4.73	6.2
Ghori Canal	30-11-1915	1915—16	4.21	1.3
Sukhra Canal	31-3-1915	1914—15	2.30	0.8
Tanks in Banda District	31-3-1915	1914—15	5.46	2.6
TOTAL			<u>129.45</u>	<u>151</u>

*Figures relate to 1942-43.

Irrigation Development Plan Projects—(North India)

<i>Cost per acre of area irrigated Rs. (Col. 4/5)</i>	<i>Accumulated interest arrears (Rs. Lakhs)</i>	<i>Accumulated surplus revenue (Rs. Lakhs)</i>	<i>Total sum at charge (Rs. Lakhs)</i>	<i>Net revenue* (Rs. Lakhs)</i>	<i>Percentage return on total capital outlay (Col. 10/4)</i>
6	7	8	9	10	11
30·96	...	1444·23	449·04	68·04	15·16
40·20	...	467·88	420·93	35·08	8·33
17·10	...	824·37	61·23	23·00	37·56
32·77	...	88·44	123·87	14·26	11·51
<u>32·62</u>	...	<u>2824·92</u>	<u>1055·07</u>	<u>140·38</u>	<u>13·31</u>
158·05	...	1·57	26·87	0·92	3·43
<u>158·05</u>	...	<u>1·57</u>	<u>26·87</u>	<u>0·92</u>	<u>3·43</u>
33·29	...	2826·49	1081·94	141·30	13·06
30·15	...	10·85	6·03	0·59	9·75
<u>30·15</u>	...	<u>10·85</u>	<u>6·03</u>	<u>0·59</u>	<u>9·75</u>
93·24	17·68	...	40·99	0·65	2·81
51·50	104·78	...	191·30	2·32	2·68
35·00	4·01	...	6·11	-0·02	...
81·00	2·50	...	4·12	-0·04	...
<u>56·49</u>	<u>128·97</u>	...	<u>242·52</u>	<u>2·91</u>	<u>2·56</u>
46·94	56·10	...	118·78	1·88	3·00
<u>46·94</u>	<u>56·10</u>	...	<u>118·78</u>	<u>1·88</u>	<u>3·00</u>
79·08	70·75	...	121·36	-0·30	...
46·50	2·44	...	4·30	-0·02	...
80·93	44·82	...	96·62	1·23	2·37
106·00	9·63	...	18·11	0·02	0·27
76·29	3·64	...	8·37	0·04	0·89
323·84	6·44	...	10·65	-0·02	...
287·51	2·84	...	5·14	-0·01	...
210·00	6·05	...	11·51	-Neg.	...
<u>85·73</u>	<u>146·61</u>	...	<u>276·06</u>	<u>0·94</u>	<u>0·73</u>

Table 2(a)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs. Lakhs)	Area irrigated* (000' Acres)
1	2	3	4	5
1891—1920				
PRODUCTIVE WORKS			6.03	20
UNPRODUCTIVE WORKS			305.68	485
TOTAL			311.71	505
1921—30				
UNPRODUCTIVE WORKS				
Sarda Canal	31-3-1930	1928—29	1024.50	1153
Barwar Lake and Canal	31-3-1923	1922—23	7.94	4
Bela Sagar Tank	31-3-1930	1929—30	5.84	6.4
Kamalपुरa Tank	31-3-1930	1929—30	3.35	0.7
Jaiwanti Tank	31-3-1930	1929—30	10.08	0.6
Kit-ham Reservoir	31-3-1921	1921—22	2.48	...
TOTAL			1054.19	1165
1931—1940				
PRODUCTIVE WORKS				
Ramganga Canal	31-3-1935	1930—31	26.70	17
State Tube Wells	18-5-1934	1932—33	176.04	608
Tubewell taken on lease by Government	...	1934—35	Neg.	1.4
TOTAL			202.74	626
UNPRODUCTIVE WORKS				
Fyzabad Electricity & Gogra Pumping Scheme	20-5-1936	...	25.10	18
Aunjhar Tank & Canal	31-3-1931	...	4.72	1.1
Raipura Tank	16-10-1931	...	3.86	1.4
Kewar Nadi Scheme	...	1939—40	...	...
TOTAL			33.68	21
1921—1940				
PRODUCTIVE WORKS			202.74	626
UNPRODUCTIVE WORKS			1087.87	1190
TOTAL			1290.61	1816
Projects included in the First Five Year Plan—On completion				
Belan & Tons Canals	...	...	193.00	38
Tube Wells	...	...	719.00	740
Other Irrigation Schemes (Excluding tubewells etc. to be completed by 1966-67)	...	...	1293.00	1176
TOTAL			2205.00	1954
PLAN TOTAL			2205.00	1954

*Figures relate to 1942-43

Irrigation Development Plan Projects—(North India)—concl'd.

<i>Cost per acre of area irrigated (Rs.) (Col. 4/5)</i>	<i>Accumulated interest arrears (Rs. Lakhs)</i>	<i>Accumulated surplus revenues (Rs. Lakhs)</i>	<i>Total sum at charge (Rs. Lakhs)</i>	<i>Net revenue* (Rs. Lakhs)</i>	<i>Percentage return on total capital outlay (Col. 10/4)</i>
6	7	8	9	10	11
30·15	...	10·85	6·03	0·59	9·75
62·98	331·68	...	637·36	5·73	1·87
<u>61·68</u>	<u>331·68</u>	<u>10·85</u>	<u>643·39</u>	<u>6·32</u>	<u>2·03</u>
88·86	626·22	...	1650·72	38·05	3·71
198·50	9·04	...	16·98	0·05	0·60
92·70	4·11	...	9·94	Neg.	...
478·57	2·48	...	5·83	Neg.	...
1680·00	9·32	...	19·40	-0·07	...
...	2·82	...	5·30	-0·08	...
<u>90·49</u>	<u>653·99</u>	<u>...</u>	<u>1708·17</u>	<u>37·95</u>	<u>3·60</u>
157·05	26·10	...	52·80	-0·04	...
28·95	16·13	...	192·16	6·22	3·53
...	...	0·10	Neg.	0·13	...
<u>32·38</u>	<u>42·23</u>	<u>0·10</u>	<u>244·96</u>	<u>6·31</u>	<u>3·11</u>
139·44	7·13	...	32·23	-0·62	...
429·09	4·28	...	9·01	-0·01	...
275·71	3·41	...	7·27	-0·01	...
...	0·06	...	0·06	...	...
<u>160·38</u>	<u>14·88</u>	<u>...</u>	<u>48·57</u>	<u>-0·64</u>	<u>1·90</u>
32·38	42·23	0·10	244·96	6·31	3·11
91·44	668·87	...	1756·74	37·31	3·43
<u>71·06</u>	<u>711·10</u>	<u>0·10</u>	<u>2001·70</u>	<u>43·62</u>	<u>3·38</u>
507·8	...	...	...	...	...
97·16	...	...	...	...	...
109·94	...	...	...	...	...
<u>112·84</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>
<u>112·84</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>

Table 2(b)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs. Lakhs)	Area irrigated* (000' Acres)
1	2	3	4	5
Before 1891				
BIHAR				
PRODUCTIVE WORKS				
Son Project	31-3-1981	1875	268.43	510
TOTAL			<u>268.43</u>	<u>510</u>
1891—1900				
UNPRODUCTIVE WORKS				
BENGAL				
Midnapore Canal	1889	...	784.92	66
ORISSA				
Orissa Canals System	31-3-1895	1865	271.87	233
Rushikulya System	31-3-1901	1892—93	56.14	114
TOTAL			<u>412.93</u>	<u>413</u>
1901—1910				
UNPRODUCTIVE WORKS				
BIHAR				
Dhaka Canal	31-3-1908	1906—07	6.32	11
TOTAL			<u>6.32</u>	<u>11</u>
1911—1920				
UNPRODUCTIVE WORKS				
BENGAL				
Damodar Canal . . . . .	...	...	126.33	162
Bakreshwar Irrigation Scheme . . . . .	...	...	7.14	7
BIHAR				
Tribeni Canal	31-3-1914	1911—12	81.58	107
TOTAL			<u>215.05</u>	<u>276</u>
1891—1920				
PRODUCTIVE WORKS . . . . .	...	...	...	...
UNPRODUCTIVE WORKS . . . . .	...	...	634.30	700
TOTAL . . . . .	...	...	<u>634.30</u>	<u>700</u>

*Figures relate to 1942-43.

Irrigation Development Plan Projects—(East India)

<i>Cost per acre of area irrigated (Rs.) (Col. 4/5)</i>	<i>Accumulated interest arrears (Rs. Lakhs)</i>	<i>Accumulated surplus revenue (Rs. Lakhs)</i>	<i>Total sum at charge (Rs. Lakhs)</i>	<i>Net revenue* (Rs. Lakhs)</i>	<i>Percentage return on total capital outlay (Col. 10/4)</i>
6	7	8	9	10	11
<u>52.63</u>	<u>12.34</u>	...	<u>280.57</u>	<u>17.84</u>	<u>6.65</u>
<u>52.63</u>	<u>12.34</u>	...	<u>280.57</u>	<u>17.84</u>	<u>6.65</u>
128.66	203.38	...	288.30	-0.03	
116.61	650.29	...	922.16	Neg.	...
49.25	54.89	...	111.03	0.87	1.55
<u>99.97</u>	<u>908.56</u>	...	<u>1321.49</u>	<u>0.84</u>	<u>0.20</u>
<u>57.45</u>	<u>3.27</u>	...	<u>9.60</u>	<u>0.24</u>	<u>3.80</u>
<u>57.45</u>	<u>3.27</u>	...	<u>9.60</u>	<u>0.24</u>	<u>3.80</u>
77.98	39.97	...	166.30	1.95	1.55
102.00	4.57	...	11.71	-0.18	...
<u>76.24</u>	<u>79.33</u>	...	<u>160.92</u>	<u>1.77</u>	<u>2.16</u>
<u>77.92</u>	<u>123.87</u>	...	<u>338.93</u>	<u>3.54</u>	<u>1.65</u>
...
<u>90.61</u>	<u>1035.70</u>	...	<u>1670.02</u>	<u>4.62</u>	<u>0.73</u>
<u>90.61</u>	<u>1035.70</u>	...	<u>1670.02</u>	<u>4.62</u>	<u>0.73</u>

Table 2. (b)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs. Lakhs)	Area irrigated* (000' Acres)
1	2	3	4	5
Projects included in the First Five Year Plan—on Completion				
BIHAR				
Sikri (Upper Valley) Irrigation Tubewells	93.00	60
Other Irrigation Schemes	590.00	434
			731.00	358
TOTAL			1414.00	852
ORISSA				
Hirakud Dam	6379.00@	1,785
Other Irrigation Works	402.00	502
TOTAL			6781.00	2287
WEST BENGAL				
Damodar Valley Projects	2222.00@	1,141
Mayurakshi	1458.00@	600
Sonarpur Arrah Panch Malta Scheme	105.00	46
Bagjale Ghuni Jantragachi	99.00	26
Other Irrigation Schemes	187.00	333
TOTAL			4071.00	2146
ASSAM				
Other Irrigation Schemes	200.00	218
TOTAL			200.00	218
PLAN TOTAL			12466.00	5503

*Figures relate to 1942-43.

@ Cost of Irrigation portion only.

Irrigation Development Plan Projects—(East India)—concl.

<i>Cost per acre of Area Irrigated (Rs.) (Col. 4/5)</i>	<i>Accumulated interest arrears (Rs. Lakhs)</i>	<i>Accumulated surplus revenue (Rs. Lakhs)</i>	<i>Total sum at charge (Rs. Lakhs)</i>	<i>Net revenue* (Rs. Lakhs)</i>	<i>Percentage return on total capital outlay (Col. 10/4)</i>
6	7	8	9	10	11
155.0
135.9
204.2
<u>165.9</u>
357.4
80.1
<u>296.5</u>
194.7
243.0
228.3
380.8
56.1
<u>190.0</u>
91.7
<u>91.7</u>
<u>226.5</u>

Table 2(c)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs. Lakhs)	Area irrigated* (000 Acres)
1	2	3	4	5
Before 1891				
MADRAS				
PRODUCTIVE WORKS				
Godavari Delta System	31-3-1890	1877—78	190.84	955.0
Cauvery Delta System	31-3-1889	...	83.03	129.0
Srivaikuntam Anicut System	31-3-1889	...	17.75	18.0
Pennar River Canals System	31-3-1894	1860—61	70.57	86.0
TOTAL			362.19	1188.0
UNPRODUCTIVE WORKS				
Kurnool Cuddapah Canal	Not known	1882—83	233.87	94.0
Barur Tank	31-3-1891	...	4.52	2.5
TOTAL			238.39	96.5
1891—1900				
MADRAS				
PRODUCTIVE WORKS				
Mehamattur Anicut System	March 1891	...	0.87	4.0
Thadapalli Channel System	1893	...	1.77	8.0
Kalingarayan Channel System	1893	...	1.80	7.0
Vridhachalam Anicut System	31-3-1893	...	1.08	8.0
Chembarambakkam Tank System	31-3-1893	...	7.64	2.0
Marudur Anicut System	1893	...	0.60	14.0
Arkenkota Channel System	31-3-1894	...	1.44	3.0
Tirukkoyilur Anicut System	31-3-1895	...	3.99	18.0
Shatiatope Anicut System	31-3-1895	...	10.90	37.0
Cheyyar Anicut System	31-3-1896	...	5.40	17.0
Cumbum Tank System	31-3-1896	...	0.86	1.3
Poiney Anicut System	1897	...	3.04	1.8
Periyar System	31-3-1897	1896—97	108.36	102.0
Kistna Delta System	31-3-1898	...	224.06	849.0
Nandiyar Channel System	1899	1895—96	0.66	3.0
TOTAL			372.47	1075.1
UNPRODUCTIVE WORKS				
Vallur Anicut	31-3-1893	...	0.76	0.4
Madras Water Supply & Irrigation System	1893	...	18.69	2.0
Pelandorai Anicut System	1893	...	6.92	11.6
Palar Anicut System	31-3-1896	...	24.89	11.1
Chicacole Minor Rivers System	31-3-1900	...	2.89	19.6
TOTAL			54.15	44.7

*Figures relate to 1942-43

Irrigation Development Plan Projects—(South India)

<i>Cost per acre of area irrigated (Rs.) (Col. 4/5)</i>	<i>Accumulated interest arrears (Rs. Lakhs)</i>	<i>Accumulated surplus revenue (Rs. Lakhs)</i>	<i>Total sum at charge (Rs. Lakhs)</i>	<i>Net revenue* (Rs. Lakhs)</i>	<i>Percentage return on total capital outlay (Col. 10/4)</i>
6	7	8	9	10	11
19.98	...	1518.49	190.84	38.18	20.0
64.36	...	506.01	83.04	7.98	9.61
98.61	...	0.79	17.75	0.69	3.86
82.06	...	115.33	70.57	6.25	8.85
30.49	...	2140.62	362.20	53.10	14.66
248.79	453.23	...	687.10	2.27	0.97
180.08	4.75	...	9.27	0.11	2.50
247.03	457.98	...	696.37	2.38	1.00
21.75	...	3.71	0.87	0.05	5.96
22.13	...	19.31	1.77	0.54	30.19
25.71	...	7.61	1.80	0.26	14.55
13.50	...	6.74	1.08	0.08	7.05
382.00	...	4.57	7.64	-0.08	...
4.29	...	4.71	0.60	0.40	66.87
48.00	...	1.09	1.44	0.17	11.89
22.17	...	8.57	3.99	0.17	4.29
29.46	...	47.91	10.90	0.89	8.18
31.76	...	0.29	5.40	0.29	5.54
66.15	...	0.13	0.86	-0.07	...
168.88	...	13.66	3.04	-0.41	...
106.23	...	37.30	108.36	6.50	6.00
26.39	...	1192.99	224.06	37.25	16.63
22.00	...	0.28	0.66	0.11	16.71
34.64	...	1348.87	372.47	46.15	12.39
190.00	0.61	...	1.37	-0.01	...
934.50	29.98	...	48.67	0.17	0.93
59.65	4.96	...	11.88	0.08	1.10
224.23	8.18	...	33.07	-0.98	...
14.74	...	7.44	2.89	0.20	6.83
121.14	43.73	7.44	97.88	-0.54	-1.00

Table 2(c)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs. Lakhs)	Area irrigated* (000' Acres)
1	2	3	4	5
1901—1910				
PRODUCTIVE WORKS				
Lower-Coloroon Anicut System .	30-6-1903	...	30.02	85.0
TOTAL			<u>30.02</u>	<u>85.0</u>
UNPRODUCTIVE WORKS				
Muniyeru System	1901—02	1898—99	6.10	9.0
Dondapad Tank	31-3-1903	1898—99	1.40	0.4
Yerur Tank	31-3-1907	1912—13	0.63	1.3
Sagileru System	31-3-1907	1898—99	4.65	Neg.
Atmakur Tank	31-3-1907	1912—13	1.25	0.5
Jangamaheswarapuram Tank .	31-3-1908	1912—13	0.72	0.15
TOTAL			<u>14.75</u>	<u>11.4</u>
1911—1920				
MADRAS				
PRODUCTIVE WORKS				
Kistna East Bank Canal Extension System	31-10-1913	1917—18	58.40	77.0
TOTAL			<u>58.40</u>	<u>77.0</u>
UNPRODUCTIVE WORKS				
Anamasamudram Berapenji Tank .	31-3-1910	1911—12	0.74	0.2
Hajipuram Tank	31-3-1911	1910—11	3.12	0.8
Ponnalur Tank	31-3-1911	1910—11	2.19	0.8
Markapur Tank	31-3-1911	1909—10	1.29	0.7
Nagavalli River System	31-3-1913	1909—10	17.67	14.0
Venkatapuram Tank	31-3-1913	1921—22	3.85	0.3
Bhavanasi Tank	31-3-1919	1921—22	2.65	0.6
Yellanur Tank	31-3-1919	1920—21	2.70	0.5
Panjapati Reservoir System	30-6-1919	1924—25	3.39	...
Siddapur Tank	31-10-1919	1921—22	8.04	1.0
Nagavaram Anicut & Supply Channel	31-12-1919	1920—21	1.10	0.2
TOTAL			<u>46.74</u>	<u>18.7</u>
1891—1920				
PRODUCTIVE WORKS			460.89	1237.1
UNPRODUCTIVE WORKS			115.64	74.8
TOTAL			<u>576.53</u>	<u>1311.9</u>

*Figures relate to 1942-43.

Irrigation Development Plan Projects—(South India)—contd.

<i>Cost per acre of area irrigated (Rs.) (Col. 4)</i>	<i>Accumulated interest arrears (Rs. Lakhs)</i>	<i>Accumulated surplus Revenue (Rs. Lakhs)</i>	<i>Total sum at charge (Rs. Lakhs)</i>	<i>Net Revenue* (Rs. Lakhs)</i>	<i>Percentage return on total capital outlay (Col. 10)</i>
6	7	8	9	10	11
35.32	...	138.50	30.02	1.21	4.02
35.32	...	138.50	30.02	1.21	4.02
67.78	2.89	...	8.99	0.32	5.21
350.00	2.07	...	3.47	0.01	1.02
48.46	0.61	...	1.24	0.61	2.04
...	8.11	...	12.76	-0.03	...
250.00	1.17	...	2.42	Neg.	...
480.00	0.75	...	1.47	Neg.	...
129.38	15.60	...	30.35	0.31	2.10
75.84	...	8.71	58.40	5.25	8.99
75.84	...	8.71	58.40	5.25	8.99
...	0.96	...	1.69	-0.02	...
390.00	2.96	...	6.08	0.01	0.42
273.75	2.69	...	4.88	Neg.	...
184.28	1.24	...	2.53	-0.03	...
126.21	4.95	...	22.62	0.73	4.13
1283.33	4.18	...	8.03	0.004	0.11
441.66	2.55	...	5.21	0.03	1.09
540.00	2.35	...	5.05	0.003	0.10
...	3.49	...	6.88	-0.03	...
804.00	8.11	...	16.15	0.04	0.46
550.00	0.85	...	1.95	0.005	0.41
249.95	34.33	...	81.07	0.74	1.59
37.26	...	1496.08	460.89	52.61	11.41
154.59	93.66	7.44	209.30	0.51	0.44
43.95	93.66	1503.52	670.19	53.12	9.21

Table 2(c)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs. Lakhs)	Area irrigated* (000' Acres)
1	2	3	4	5
1921—30				
MADRAS				
PRODUCTIVE WORKS				
Polavaram Island System	28-2-1934	1929—30	16.96	31.0
Caüvery Mettur System	30-9-1934	1932—33	650.80	133.0
Kattalai System . . . . .	...	1929—30	41.22	51.0
TOTAL			708.98	215.0
UNPRODUCTIVE WORKS				
Mopad Reservoir System	30-4-1921	1921—22	22.91	3.7
Kanniyampalayam Anicut	31-3-1922	1924—25	1.11	0.3
Tholudur Reservoir System	31-3-1925	1924—25	26.23	24.0
TOTAL			50.25	28.0
Projects included in the First Five Year Plan—On Completion				
MADRAS				
Lower Bhawani . . . . .	...	...	961.00	207.0
Malampurzha . . . . .	...	...	380.00	40.0
Mettur Canal . . . . .	...	...	245.00	45.0
Mahimuthwi . . . . .	...	...	398.00	20.0
Bhairavanitippa . . . . .	...	...	102.00	8.0
Araniyar . . . . .	...	...	95.00	3.0
Walyar . . . . .	...	...	100.00	7.0
Tungabhadra . . . . .	...	...	1970.00	250.0
Other Irrigation Schemes . . . . .	...	...	709.00	28.0
TOTAL			4960.00	608.0
MYSORE				
Bhadra Project (1st Stage) . . . . .	...	...	2000.00	180.0
Tunga Anicut . . . . .	...	...	200.00	21.0
Negu Reservoir . . . . .	...	...	220.00	20.0
Other Irrigation Schemes . . . . .	...	...	289.00	29.0
TOTAL			2709.00	250.0
TRAVANCORE-COCHIN				
Peechi . . . . .	...	...	173.00	46.0
Chalakudy . . . . .	...	...	120.00	50.0
Neyyar . . . . .	...	...	120.00	31.0
Other Irrigation Schemes . . . . .	...	...	197.00	41.0
TOTAL			610.00	168.0
PLAN TOTAL			8279.00	1026.0

*Figures relate to 1942-43.

†In the case of these projects the cost really is somewhat less because the total expenditure includes expenditure on pen stock pipes etc. for the development of power at a future date.

Irrigation Development Plan Projects (South India)—concl'd.

<i>Cost per acre of area irrigated (Rs.) (Col. 4/5)</i>	<i>Accumulated interest arrears (Rs. Lakhs)</i>	<i>Accumulated surplus revenue (Rs. Lakhs)</i>	<i>Total sum at charge (Rs. Lakhs)</i>	<i>Net revenue* (Rs. Lakhs)</i>	<i>Percentage return on total capital outlay (Col. 10/4)</i>
6	7	8	9	10	11
54.70	1.25	...	18.21	0.68	4.02
489.31	334.51	...	985.31	17.63	2.71
80.82	20.06	...	61.28	-0.04	...
329.76	355.82	...	1,064.80	18.27	2.58
619.18	20.73	...	43.64	0.09	0.41
370.00	1.35	...	2.46	-0.11	...
109.29	15.41	...	41.63	0.99	3.78
179.46	37.49	...	87.73	0.97	1.93
464.2†	...	...	...	...	...
950.0†	...	...	...	...	...
544.4	...	...	...	...	...
1,990.0	...	...	...	...	...
1,275.0	...	...	...	...	...
3,166.6	...	...	...	...	...
1,428.5	...	...	...	...	...
788.0	...	...	...	...	...
2,532.1	...	...	...	...	...
815.8	...	...	...	...	...
1,111.1†	...	...	...	...	...
952.3	...	...	...	...	...
1,100.0	...	...	...	...	...
996.5	...	...	...	...	...
1,083.6	...	...	...	...	...
376.1	...	...	...	...	...
240.0	...	...	...	...	...
387.1	...	...	...	...	...
480.5	...	...	...	...	...
363.1	...	...	...	...	...
806.92	...	...	...	...	...

Table 2(d)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs. Lakhs)	Area irrigated* (000' Acres)
1	2	3	4	5
Before 1891				
BOMBAY				
PRODUCTIVE WORKS				
Gadikeri Tank	1881—82	1882—83	0.17	0.4
Mavinkop Tank	1881—82	1882—83	0.34	0.5
Ekruk Tank	1890—91	1872—73	13.40	5.4
TOTAL			13.91	6.3
UN-PRODUCTIVE WORKS				
Kasurdi Tank	1877—78	1869—70	0.46	...
Chikhli Canal	1882—83	1870—71	0.57	0.4
Hathmati & Kharicut Canal	1883—84	1873—74	13.19	14.4
Dambal Tank	1884—85	1880—81	0.64	0.3
Madleri Tank	1885—86	1884—85	0.81	0.1
Hartala Tank	1886—87	1872—73	0.73	0.1
Mhaswa Tank	1886—87	1877—78	1.39	0.5
Madag Tank	1888—89	1866—67	1.68	0.5
Asundi Tank	1889—90	1884—85	0.75	0.2
Muchkundi Tank	1890—91	1884—85	1.59	...
Bhadalwadi Tank	1890—91	1881—82	2.27	1.1
Bhatodi Tank	1891—92	1871—72	3.79	0.3
Koregaon Tank	1891—92	1868—69	0.39	0.6
Krishna Canal	1891—92	1869—70	9.50	8.6
Upperman River Works	1891—92	1872—73	4.39	0.3
Maini Tank	1891—92	1875—76	4.96	1.2
Ashti Tank	1892—93	1881—82	8.42	4.4
Revari Canal	1892—93	1865—66	0.60	0.7
Shirsuphal Tank	1892—93	1879—80	2.25	0.3
Lower Pinjhra River Works	1894—95	1851—52	4.69	2.5
Yerla River Irrigation Works	1895—96	1869—70	7.82	4.5
Mutha Canal incl. Matoba Tank	1896—97	1874—75	70.20	16.8
Jamda Canal	1901—02	1870—71	10.51	2.4
Kadwa River Works	1907—08	1868—69	10.36	6.2
TOTAL			161.96	66.4
Before 1891 TOTAL			175.87	72.7

* NOTE:—Figures relate to 1942—1943

Irrigation Development Projects (West India)

Cost per acre of area irrigated (Rs.) (Col. 4/5)	Accumulated interest arrears (Rs. Lakhs)	Accumulated surplus revenue (Rs. Lakhs)	Total sum at charge (Rs. Lakhs)	Net revenue* (Rs. Lakhs)	Percentage return on total capital outlay (Col. 10/4)
6	7	8	9	10	11
42.50	...	0.69	0.17	0.01	6.74
68.00	...	0.03	0.34	0.02	4.72
248.13	...	4.99	13.40	1.75	13.06
<u>220.79</u>	<u>...</u>	<u>5.71</u>	<u>13.91</u>	<u>1.78</u>	<u>12.80</u>
...	1.33	...	1.79	0.03	6.52
142.50	1.30	...	1.87	0.004	0.68
91.60	16.60	...	29.79	-0.01	...
213.33	1.95	...	2.59	-0.05	...
810.00	1.99	...	2.80	-0.01	...
730.00	1.03	...	1.76	0.02	2.74
278.00	3.09	...	4.48	0.02	1.44
336.00	4.38	...	6.66	0.002	0.13
375.00	1.33	...	2.08	Neg.	...
...	3.25	...	4.83	0.002	0.10
206.36	4.13	...	6.40	0.03	1.25
1,263.33	8.51	...	12.30	0.04	0.96
65.00	1.19	...	1.58	-0.03	...
110.47	3.97	...	13.47	0.46	4.87
1,463.33	10.88	...	15.27	-0.03	...
413.33	9.34	...	14.30	0.03	0.63
191.36	14.89	...	23.31	0.09	1.07
85.71	0.72	...	1.32	-0.01	...
750.00	4.52	...	6.76	0.02	0.83
187.60	4.13	...	8.81	0.17	3.64
173.78	15.77	...	23.59	0.16	2.02
417.86	29.38	...	99.57	4.00	5.70
437.91	3.52	...	14.03	-0.04	...
167.10	17.47	...	27.83	0.58	5.61
<u>243.92</u>	<u>164.67</u>	<u>..</u>	<u>326.59</u>	<u>5.48</u>	<u>3.41</u>
<u>241.91</u>	<u>164.67</u>	<u>5.71</u>	<u>340.50</u>	<u>7.26</u>	<u>4.16</u>

Table 2(d)—Old Irrigation Project and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs. Lakhs)	Area irrigated* (000' Acres)
1	2	3	4	5
1891—1900				
BOMBAY				
UN-PRODUCTIVE WORKS				
Parsul Tank	1895—96	1889—90	2.15	0.3
Gokak Canal Ist Section & Storage Works	1896—97	1884—85	15.63	12.2
Mhaswad Tank	1896—97	1884—85	20.96	2.5
TOTAL			<u>38.74</u>	<u>15.0</u>
PRODUCTIVE WORKS . . . . .			...	...
1901—1910				
BOMBAY				
UN-PRODUCTIVE WORKS				
Pathri Tank	1901—02	1906—07	6.43	1.1
Nira Left Bank Canal	1905—06	1885—86	147.08	74.1
Wangroli Tank	1908—09	1904—05	2.93	1.3
Tranza Nagrama Tank	1909—10	1904—05	2.81	0.2
Savli Tank	1909—10	1908—09	2.55	1.7
Chankapur Tank	1909—10	1909—10	20.80	11.6
TOTAL			<u>182.60</u>	<u>90.0</u>
1911—1920				
UN-PRODUCTIVE WORKS]				
Godavari Canal	1915—16	1911—12	106.59	45.9
Putelao Tank	1916—17	1915—16	1.16	0.13
Dharma Canal	1921—22	1913—14	0.98	9.1
TOTAL			<u>108.73</u>	<u>55.1</u>
1891—1920				
PRODUCTIVE WORKS . . . . .			...	...
UN-PRODUCTIVE WORKS			330.07	160.1
TOTAL			<u>330.07</u>	<u>160.1</u>
1921—30				
PRODUCTIVE WORKS				
Shahada Channel	1921—22	1922—23	1.08	2.4
TOTAL			<u>1.08</u>	<u>2.4</u>

NOTE:—Figures relate to 1942-43.

Irrigation Development Plan Projects (West India)—contd.

<i>Cost per acre of area irrigated (Rs.) (Col. 4/5)</i>	<i>Accumulated interest arrears (Rs. Lakhs)</i>	<i>Accumulated surplus revenue (Rs. Lakhs)</i>	<i>Total sum at charge (Rs. Lakhs)</i>	<i>Net revenue* (Rs. Lakhs)</i>	<i>Percentage return on total capital outlay (Col. 10/4)</i>
6	7	8	9	10	11
716.67	3.39	...	5.54	0.03	1.39
128.11	4.12	...	19.74	0.57	3.67
838.40	33.45	...	54.41	0.38	1.83
<u>258.26</u>	<u>40.96</u>	...	<u>79.69</u>	<u>0.98</u>	<u>2.53</u>
...
584.54	6.63	...	13.06	0.06	0.87
198.49	12.28	...	159.35	7.38	5.02
223.38	3.52	...	6.45	0.005	0.18
1,405.00	3.80	...	6.61	0.001	0.04
150.00	3.24	...	5.79	0.05	1.96
179.31	21.19	...	41.99	1.37	6.59
<u>202.88</u>	<u>50.66</u>	...	<u>233.25</u>	<u>8.88</u>	<u>4.86</u>
232.22	54.69	...	161.28	4.22	3.96
892.30	1.54	...	2.71	0.08	...
10.77	1.64	...	2.62	0.001	0.11
<u>197.33</u>	<u>57.87</u>	...	<u>166.61</u>	<u>4.14</u>	<u>3.81</u>
...
<u>206.16</u>	<u>149.49</u>	...	<u>479.55</u>	<u>14.00</u>	<u>4.24</u>
<u>206.16</u>	<u>149.49</u>	...	<u>479.55</u>	<u>14.00</u>	<u>4.24</u>
45.00	...	0.14	1.08	0.04	3.52
<u>45.00</u>	...	<u>0.14</u>	<u>1.08</u>	<u>0.04</u>	<u>3.52</u>

Table 2(d)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs. Lakhs)	Area irrigated* (000 Acres)
1	2	3	4	5
UN-PRODUCTIVE WORKS				
Pravara River Works	1926-27	1909-10	151.02	70.8
TOTAL			<u>151.02</u>	<u>70.8</u>
1931—40				
UN-PRODUCTIVE WORKS				
Nira Right Bank Canal	1937-38	1924-25	412.22	74.1
TOTAL			<u>412.22</u>	<u>74.1</u>
1921—40				
PRODUCTIVE WORKS			1.08	2.4
UN-PRODUCTIVE WORKS			563.24	144.9
TOTAL			<u>564.32</u>	<u>147.3</u>
Projects included in the First Five Year Plan—On Completion				
BOMBAY				
Gangapur . . . . .	...	...	334.00	45.0
Ghataprabha Left Bank Canal . . . . .	...	...	545.00	100.0
Mahi Right Bank Canal . . . . .	...	...	425.00	90.0
Lower Tapti Valley (Stage I) . . . . .	...	...	1,216.00	652.0
Other Irrigation Schemes . . . . .	...	...	45.00	6.0
TOTAL			<u>2,565.00</u>	<u>893.0</u>
SAURASHTRA				
Machhu . . . . .	...	...	125.00	22.0
Brahmani . . . . .	...	...	100.00	27.0
Shetrunji & Bhadar . . . . .	...	...	300.00	N.A.
Other Irrigation Schemes . . . . .	...	...	577.00	71.0
TOTAL			<u>802.00†</u>	<u>120.0</u>
KUTCH				
Irrigation Schemes . . . . .	...	...	91.00	38.0
TOTAL			<u>91.00</u>	<u>38.0</u>
PLAN TOTAL			<u>3,458.00†</u>	<u>1,051.00†</u>

*Figures relate to 1942-1943.

†Excluding Shetrunji and Bhadar.

Irrigation Development Plan Projects (West India)—concl'd.

<i>Cost per acre of area Irrigated (Rs.) (Col. 4/5)</i>	<i>Accumulated interest arrears (Rs. Lakhs)</i>	<i>Accumulated surplus revenue (Rs. Lakhs)</i>	<i>Total sum at charge (Rs. Lakhs)</i>	<i>Net revenue* (Rs. Lakhs)</i>	<i>Percentage return on total capital outlay (Col. 10/4)</i>
6	7	8	9	10	11
213·30	106·11	...	257·13	8·14	5·39
<u>213·30</u>	<u>106·11</u>	<u>...</u>	<u>257·13</u>	<u>8·14</u>	<u>5·39</u>
556·30	393·39	...	805·61	7·46	1·81
<u>556·30</u>	<u>393·39</u>	<u>...</u>	<u>805·61</u>	<u>7·46</u>	<u>1·81</u>
45·00	...	0·14	1·08	0·04	3·52
388·71	499·50	...	1,062·74	15·60	2·77
<u>383·11</u>	<u>499·50</u>	<u>0·14</u>	<u>1,063·82</u>	<u>15·64</u>	<u>2·77</u>
742·2	...	...	...	...	...
545·0	...	...	...	...	...
472·2	...	...	...	...	...
186·5	...	...	...	...	...
750·0	...	...	...	...	...
<u>287·2</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>
568·2	...	...	...	...	...
370·3	...	...	...	...	...
N.A.	...	...	...	...	...
812·7	...	...	...	...	...
<u>668·3</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>
239·5	...	...	...	...	...
<u>239·5</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>
329·0	...	...	...	...	...
<u>329·0</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>

Table 2(e)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs. Lakhs)	Area irrigated* (000' Acres)
1	2	3	4	5
1901-1910				
MADHYA PRADESH				
UN-PRODUCTIVE WORKS				
Khapri-Aranda	March 1909	1906-07	3.62	9.9
Morawada	March 1909	1905-06	3.78	3.4
Pindraon	March 1909	1905-06	2.34	3.9
TOTAL			<u>9.74</u>	<u>17.2</u>
1911-1920				
UN-PRODUCTIVE WORKS				
Roomal	Nov. 1911	Oct. 1909	3.17	2.6
Ramtek Reservoir	Feb. 1914	Oct. 1909	27.95	12.6
Khair-Banda	Mar. 1915	1905-06	7.61	9.7
Chandpur	Oct. 1915	Sep. 1907	6.85	9.1
Asola Mendha	Mar. 1918	Sep. 1911	18.27	16.6
Newar Tar Ametha Reservoir	Jan 1919	1909-10	3.83	0.5
Barera-Kalan with Mohari feeder	Mar. 1920	Mar. 1911	2.35	1.0
TOTAL			<u>70.03</u>	<u>52.1</u>
1891-1920				
UN-PRODUCTIVE WORKS				
TOTAL			<u>79.77</u>	<u>69.3</u>
1921-1930				
UN-PRODUCTIVE WORKS				
Jamunia	Mar. 1922	Aug. 1916	5.41	5.2
Katangjheri	Mar. 1922	Mar. 1916	2.00	1.3
Ghorajheri	Mar. 1923	Aug. 1910	11.46	7.8
Tandula Canal	Mar. 1923	1917-18	120.24	145.5
Naleshwar	Mar. 1923	Jul. 1916	7.01	3.0
Chorkhamara	Mar. 1923	1918-19	10.31	10.2
Bodalkhasa	Mar. 1923	Aug. 1916	7.01	10.0
Borinanala	Mar. 1923	1920-21	6.49	0.5
Wainganga Canal	Mar. 1923	Aug. 1916	53.22	58.0
Mahanadi Canal	Mar. 1927	1914-15	158.45	192.0

*Figures relate to 1942-43

Irrigation Development Plan Projects (Central India)

<i>Cost per acre of area irrigated (Rs.) (Col. 4/5)</i>	<i>Accumulated interest arrears (Rs. Lakhs)</i>	<i>Accumulated surplus revenue (Rs. Lakhs)</i>	<i>Total sum at charge (Rs. Lakhs)</i>	<i>Net revenue* (Rs. Lakhs)</i>	<i>Percentage return on total capital outlay (Col. 10/4)</i>
6	7	8	9	10	11
36.57	0.10	2.86
111.18	0.06	1.57
60.00	0.04	1.54
<u>56.63</u>	<u>0.20</u>	<u>2.05</u>
121.92	0.03	0.95
221.82	0.09	0.34
78.45	0.08	1.02
75.27	0.09	1.38
110.06	0.19	1.06
766.00	Neg.	...
235.00	-0.01	...
<u>134.41</u>	<u>0.47</u>	<u>0.67</u>
115.11	0.67	0.84
<u>115.11</u>	<u>0.67</u>	<u>0.84</u>
10.40	0.08	1.49
153.84	0.02	0.85
146.92	Neg.	...
82.64	1.59	1.32
233.66	0.02	0.35
101.08	0.06	0.57
70.10	0.07	0.96
1,298.00	Neg.	0.03
91.76	0.62	1.16
82.53	1.70	1.08

Table 2(e)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs. Lakhs)	Area irrigated* (000 Acres)
1	2	3	4	5
Pariat	Mar. 1927	1925-26	18.43	1.0
Jagwa	Mar. 1927	1925-26	3.37	0.3
Kuserla	Mar. 1927	1926-27	3.68	0.8
Kumahri	Mar. 1927	1922-23	6.42	5.8
Chandianala	Mar. 1927	1925-26	5.88	1.7
Amari	Mar. 1927	1925-26	4.88	1.2
Bori	Mar. 1927	1926-27	10.11	4.6
Boharibund	Mar. 1929	1926-27	13.00	2.3
Mala	Mar. 1929	1922-23	8.32	3.7
Kharung	Mar. 1931	1927-28	58.39	82.1
Maniari	Mar. 1933	Jul. 1930	56.55	56.0
TOTAL			570.63	593.0
1921-1940				
UN-PRODUCTIVE WORKS			570.63	593.0
TOTAL			570.63	593.0
Projects included in the First Five Year Plan—on completion				
MADHYA PRADESH				
Dudhwa . . . . .	...	...	150.00	90.0
Other Irrigation Schemes . . . . .	...	...	219.00	94.0
TOTAL			369.00	184.0
MADHYA BHARAT				
Irrigation Schemes . . . . .	...	...	339.00	152.0
TOTAL			339.00	152.0
HYDERABAD				
Tungabhadra . . . . .	...	...	2,304.00	450.0
Rajolibunda . . . . .	...	...	430.00	79.0
Godawari 1st Phase . . . . .	...	...	441.00	53.0
Other Irrigation Schemes . . . . .	...	...	251.00	149.0
TOTAL			3,426.00	731.0
PLAN TOTAL			4,134.00	1,067.0

*Figures relate to 1942-43.

Irrigation Development Plan Projects (Central India)—concl.

<i>Cost per acre of area irrigated (Rs.) (Col. 4/5)</i>	<i>Accumulated interest arrears (Rs. Lakhs)</i>	<i>Accumulated surplus revenue (Rs. Lakhs)</i>	<i>Total sum at charge (Rs. Lakhs)</i>	<i>Net revenue* (Rs. Lakhs)</i>	<i>Percentage return on total capital outlay (Col. 10/4)</i>
6	7	8	9	10	11
1,843.00	0.18	0.98
1,123.30	Neg.	...
460.00	Neg.	...
110.69	0.07	1.12
345.88	0.01	0.14
406.67	Neg.	0.07
219.78	0.07	0.70
565.21	0.006	0.05
224.86	0.01	0.14
71.12	0.34	0.59
100.98	0.19	0.34
<u>96.23</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>5.04</u>	<u>0.88</u>
<u>96.23</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>5.04</u>	<u>0.88</u>
<u>96.23</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>5.04</u>	<u>0.88</u>
166.6
233.0
<u>200.5</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>
223.0
<u>223.0</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>
512.0
544.3
832.1
168.4
468.6
<u>387.4</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>	<u>...</u>

Table 2(f)—Old Irrigation Projects and Major

<i>Zone</i>	<i>Date of completion</i>	<i>Date when system first came into operation</i>	<i>Total capital outlay (Direct & Indirect) (Rs. Lakhs)</i>	<i>Area irrigated* (000' Acres)</i>
1	2	3	4	5
Before 1891				
PUNJAB (I)				
PRODUCTIVE WORKS				
Upper Bari Doab Canal	1878-79	1860-61	108.58	697.0
Sirhind Canal	1886-87	1883-84	268.72	2048.9
TOTAL			<u>377.30</u>	<u>2,745.9</u>
1891-1900				
PUNJAB (I)				
PRODUCTIVE WORKS				
Western Jumna Canal	1895	1891-92	200.50	888.7
TOTAL			<u>200.50</u>	<u>888.7</u>
UN-PRODUCTIVE WORKS				
Ghaggar Canals	1898-99	1897	3.88	26.2
TOTAL			<u>3.88</u>	<u>26.2</u>
1891-1920				
PUNJAB (I)				
PRODUCTIVE WORKS				
UN-PRODUCTIVE WORKS				
TOTAL			<u>200.50</u>	<u>888.7</u>
			<u>3.88</u>	<u>26.2</u>
			<u>204.38</u>	<u>914.9</u>
1931-1940				
PUNJAB (I)				
PRODUCTIVE WORKS				
Sutlej Valley Project (1/3)	31-3-1933	1926-27	295.64	636.5
TOTAL			<u>295.64</u>	<u>636.5</u>
1921-1940				
PUNJAB (I)				
PRODUCTIVE WORKS				
TOTAL			<u>295.64</u>	<u>636.5</u>
			<u>295.64</u>	<u>636.5</u>

*Figures relate to 1942-43.

Irrigation Development Plan Projects (North-West India)

<i>Cost per acre of area irrigated Rs. (Col. 4/5)</i>	<i>Accumulated interest arrears (Rs. Lakhs)</i>	<i>Accumulated surplus revenue (Rs. Lakhs)</i>	<i>Total sum at charge (Rs. Lakhs)</i>	<i>Net revenue* (Rs. Lakhs)</i>	<i>Percentage return on total capital outlay (Col. 10/4)</i>
6	7	8	9	10	11
15.58	...	717.61	108.58	26.29	24.22
13.12	...	918.05	268.72	42.96	15.99
<u>13.74</u>	<u>...</u>	<u>1,635.66</u>	<u>377.30</u>	<u>69.25</u>	<u>18.35</u>
22.56	...	934.56	200.50	26.87	13.40
<u>22.56</u>	<u>...</u>	<u>934.56</u>	<u>200.50</u>	<u>26.87</u>	<u>13.40</u>
14.81	8.90	...	12.78	0.04	0.99
<u>14.81</u>	<u>8.90</u>	<u>...</u>	<u>12.78</u>	<u>0.04</u>	<u>0.99</u>
22.56	...	934.56	200.50	26.87	13.40
14.81	8.90	...	12.78	0.04	0.99
<u>22.33</u>	<u>8.90</u>	<u>934.56</u>	<u>213.28</u>	<u>26.91</u>	<u>13.17</u>
46.44	...	20.58	295.64	29.46	9.96
<u>46.44</u>	<u>...</u>	<u>20.58</u>	<u>295.64</u>	<u>29.46</u>	<u>9.96</u>
46.44	...	20.58	295.64	29.46	9.96
<u>46.44</u>	<u>...</u>	<u>20.58</u>	<u>295.64</u>	<u>29.46</u>	<u>9.96</u>

Table 2(f)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs. Lakhs)	Area irrigated* (000 Acres)
I	2	3	4	5
Projects included in the First Five Year Plan—On completion				
RAJASTHAN				
Jawai Projects	323.00	46.0
Other Irrigation Schemes	748.00	777.0
TOTAL			1,071.00	823.0
PUNJAB (I)				
Bhakra Nangal	12,320.00††	3,604.0
Harike	1,491.00	...
Tubewells	155.00	136.0
Other irrigation Schemes	277.00	700.0
TOTAL			12,752.00@	4,440.0
PATIALA AND EAST PUNJAB STATES UNION				
Irrigation Schemes	36.00	129.0
AJMER				
Irrigation Schemes	11.00	N. A.
HIMACHAL PRADESH				
Irrigation Schemes	80.00	100.0
Plan TOTAL			13,950.00	5,492.0

*Figures relate to 1942-43.

@Excluding Harike.

††Cost of Irrigation portion only.

†In the case of this project the cost of irrigation is really somewhat less because the total expenditure excludes expenditure on penstock pipes etc. necessary for the development of power at a future date.

Irrigation Development Plan Projects (North-West India)—concl'd.

<i>Cost per acre of area irrigated (Rs.) (Col. 4/5)</i>	<i>Accumulated interest arrears (Rs. Lakhs)</i>
6	7

702.2†	...
<u>96.3</u>	<u>...</u>
<u>130.1</u>	<u>...</u>

341.2	...
...	...
114.0	...
<u>39.6</u>	<u>...</u>
<u>287.2</u>	<u>...</u>

1. The figures represent half of the capital outlay and half of the total area irrigated by the Canal. The balance is shown under Pakistan.

27.9	...
N. A.	...

2. The figures represent 1/3 of the total capital outlay and 1/3 of the total area irrigated by these Canals. The balance is shown under Pakistan.

80.0	...
<u>254.0</u>	<u>...</u>

Table 2(g)—Old Irrigation Projects and Major

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & indirect) (Rs. Lakhs)	Area irrigated* (000' Acres)
1	2	3	4	5
Before 1891				
PRODUCTIVE WORKS				
PUNJAB (P)				
Upper Bari Doab Canal (‡)	1878-79	1860-61	108.58	697.0
SIND				
Sukkur Canal	1885-86	1870-71	0.48	3.0
Unharwah	1890-91	1885-86	9.37	39.1
Begari Canal	1890-91	1855-56	25.56	270.3
Desert Canal	1891-92	1872-73	29.06	266.8
N.W.F.P.				
Lower Swat Canal	1884-85	1885	57.22	165.4
TOTAL			230.27	1,491.6
UN-PRODUCTIVE WORKS				
PUNJAB (P)				
Indus Inundation Canals	1849-50	Prior to 1849	34.38	317.7
Shahpur Inundation Canals	1870-71	1870	2.26	76.2
Muzaffargarh Inundation Canals	1896	Prior to 1849	17.10	353.6
BALUCHISTAN				
Pishin Canals	31-3-1893	1888	29.53	4.7
SIND				
Fuleli Canal	1892-93	1861-62	61.09	316.7
TOTAL			144.36	1,068.9
Pre 1891—TOTAL			374.63	2,560.5
1891-1900				
PRODUCTIVE WORKS				
PUNJAB (P)				
Lower Chenab Canal.	1899-1900	1871/1892P	481.80	2,662.4
N.W.F.P.				
Kabul River Canal.	1896-97	1893	15.27	53.5
TOTAL			497.07	2,715.9
1901-1910				
UN-PRODUCTIVE WORKS				
N.W.F.P.				
Paharpur Canal	1909-10	1907	33.25	34.4
TOTAL			33.25	34.4
1911-1920				
PRODUCTIVE WORKS				
PUNJAB (P)				
Lower Jhelum Canal	31-3-1917	1901	212.97	967.2
Upper Chenab Canal.	31-3-1917	1912-13	431.25	737.2
Upper Jhelum Canal.	31-3-1917	1915-16	468.29	340.2

Pakistan before partition—contd.

<i>Cost per acre of area irrigated (Rs.) (Col. 4/5)</i>	<i>Accumulated interest arrears (Rs. Lakhs)</i>	<i>Accumulated surplus revenue (Rs. Lakhs)</i>	<i>Total sum at charge (Rs. Lakhs)</i>	<i>Net revenue* (Rs. Lakhs)</i>	<i>Percentage return on total capital outlay (Direct & Indirect) (Col. 10/4)</i>
6.	7	8	9	10	11
15.58	...	717.61	108.58	26.29	24.22
16.00	...	3.66	0.48	0.10	20.02
10.53	...	41.09	9.37	0.72	7.63
9.47	...	132.08	25.56	8.32	32.53
10.89	...	46.27	29.06	4.75	16.35
34.59	...	146.24	57.22	8.81	15.40
<u>15.44</u>	...	<u>1086.95</u>	<u>230.27</u>	<u>48.99</u>	<u>21.28</u>
10.82	32.28	...	66.66	2.13	6.19
2.97	...	6.58	2.26	-1.13	...
4.83	...	91.18	17.10	1.08	11.57
627.70	17.37	...	46.90	-0.12	...
19.29	...	129.50	61.09	3.60	5.89
<u>13.51</u>	<u>49.65</u>	<u>227.26</u>	<u>194.01</u>	<u>6.46</u>	<u>4.47</u>
<u>14.63</u>	<u>49.65</u>	<u>1314.21</u>	<u>424.28</u>	<u>55.46</u>	<u>14.80</u>
18.10	...	5230.93	481.80	197.38	40.97
28.54	...	30.81	15.27	1.59	10.39
<u>18.32</u>	...	<u>5261.74</u>	<u>497.07</u>	<u>198.97</u>	<u>40.03</u>
96.66	28.10	...	61.34	-0.04	...
<u>96.66</u>	<u>28.10</u>	...	<u>61.34</u>	<u>-0.04</u>	...
22.09	...	978.84	212.97	51.54	24.20
58.50	...	115.39	431.25	32.96	7.64
137.65	333.11	...	801.39	10.25	2.19

Table 2 (g)—Old Irrigation Projects—4

Zone	Date of completion	Date when system first came into operation	Total capital outlay (Direct & Indirect) (Rs. Lakhs)	Area irrigated* (000 acres)
1	2	3	4	5
Lower Bari Doab Canal	31-3-1917	1913-14	231.49	1408.0
TOTAL			1344.00	3452.6
UN-PRODUCTIVE WORKS				
N.W.F.P.				
Upper Swat Canal	1917-18	1914	210.92	254.5
BALUCHISTAN				
Nari Weir Canals	1-5-1918	1917	6.74	17.8
TOTAL			217.66	272.3
1891-1920				
PRODUCTIVE WORKS			1841.07	6168.5
UN-PRODUCTIVE WORKS			250.91	306.7
TOTAL			2091.98	6475.2
1921-1930				
PRODUCTIVE WORKS				
SIND				
Sind, Canal and Branches	1921-22	1922-23	8.67	47.6
Rajib, Chitti and Garang	1921-22	1922-23	2.76	8.0
Canals in Rohri	1921-22	1922-23	8.82	39.8
TOTAL			20.25	95.4
UN-PRODUCTIVE WORKS				
SIND				
Mahiwah	1922-23	1901-03	20.54	75.3
TOTAL			20.54	75.3
1931-1940				
PRODUCTIVE WORKS				
PUNJAB (P)				
Hayeli Canals	30-9-1939	12-4-39	377.61	214.7
Sutlej Valley Projects (2/3)	31-3-1933	1926-27	391.27	1273.1
Thal Project				
SIND				
Unified Lloyd Barrage System	1933-34	1932-33	2463.61	2641.4
BALUCHISTAN				
Lloyd Barrage and Canals Construction (Nasirabad Section)	1933-34	1932-33	109.96	120.6
TOTAL			3542.45	4969.8
1921-1940				
PRODUCTIVE WORKS			3562.70	5065.2
UN-PRODUCTIVE WORKS			20.54	75.3
TOTAL			3583.24	5140.5

*Figures relate to 1942-43

Pakistan before partition—contd.

Cost per acre of area irrigated (Rs.) (Col. 4/5)	Accumulated interest arrears (Rs. Lakhs)	Accumulated surplus revenue (Rs. Lakhs)	Total sum at charge (Rs. Lakhs)	Net revenue* (Rs. Lakhs)	Percentage return on total capital outlay (Direct & Indirect) (Col. 10/4)
6	7	8	9	10	11
16.44	...	1496.67	231.49	104.19	45.01
<u>38.92</u>	<u>333.11</u>	<u>2590.90</u>	<u>1677.10</u>	<u>198.94</u>	<u>14.80</u>
82.88	127.51	...	338.43	10.70	5.07
<u>37.87</u>	<u>4.74</u>	<u>...</u>	<u>11.49</u>	<u>0.48</u>	<u>7.08</u>
<u>79.93</u>	<u>132.25</u>	<u>...</u>	<u>349.92</u>	<u>11.18</u>	<u>5.14</u>
29.85	333.11	7852.64	2174.17	397.91	21.61
81.81	-160.35	...	411.26	11.14	4.44
<u>32.31</u>	<u>493.46</u>	<u>7852.64</u>	<u>2585.43</u>	<u>409.05</u>	<u>19.55</u>
18.21	...	14.28	8.67	-0.68	...
34.50	...	9.86	2.76	0.34	12.35
22.16	...	1.01	8.82	0.48	5.43
<u>21.23</u>	<u>...</u>	<u>25.15</u>	<u>20.25</u>	<u>0.14</u>	<u>0.69</u>
27.28	40.72	...	61.26	-2.51	...
<u>27.28</u>	<u>40.72</u>	<u>...</u>	<u>61.26</u>	<u>-2.51</u>	<u>...</u>
40.40	...	49.55	377.61	46.56	12.33
46.44	...	41.16	391.27	58.91	9.96
93.27	800.85	...	3264.46	102.36	4.15
91.18	25.50	...	135.46	1.61	1.46
<u>71.28</u>	<u>826.35</u>	<u>90.71</u>	<u>4368.80</u>	<u>209.44</u>	<u>5.90</u>
70.34	826.35	115.86	4389.05	209.58	5.88
27.28	40.72	...	61.26	-2.51	...
<u>69.70</u>	<u>867.07</u>	<u>115.86</u>	<u>4450.31</u>	<u>207.07</u>	<u>5.78</u>

**Table 3—Major Irrigation
(Detailed statement)**

<i>Name of the Project</i>	<i>Date begun</i>	<i>Date of completion</i>	<i>Cost during the plan period (Rs. Lakhs)</i>	<i>Total cost (Rs. Lakhs)</i>
I	2	3	4	5
I—NORTH INDIA				
Uttar Pradesh				
Belan and Tona Canals	1950	1955-56	183	193 ³
Tube-wells . . . . .	...	...	470	719
Other Irrigation Schemes (Excluding Tube-wells to be completed by 1966-67) . . . . .	...	...	558	1,293
ZONE TOTAL			1,211	2,205
II—EAST INDIA				
Bihar				
Sikri (Upper Valley) Irrigation	1952-53	1957-58	53	93
Tube-wells . . . . .	...	...	518	590
Other Irrigation Schemes . . . . .	...	...	402	731
TOTAL			973	1,414
Orissa				
Hirakud Dam	1948	1955-56	...	6,379.†
Other Irrigation Works	1949-50	1955-56	300	402
TOTAL				6,781
West Bengal				
Damodar Valley Projects	1948	1955-56	...	2,222†
Mayurakshi	1946	1954-55	1,352†	1,458†
Sonarpur Arrah Panch Malta Scheme	1951	1953-54	105	105
Bagjale Ghuni Jantragachi . . . . .	...	1953-54	99	99
Other Irrigation Schemes . . . . .	...	...	89	187
TOTAL				4,071
Assam				
Other Irrigation Schemes . . . . .	...	...	200	200
TOTAL			200	200
ZONE TOTAL				12,466

† Cost of irrigation only.

**Development Plan Projects
for India by Zones)**

<i>Irrigation benefits</i>		<i>Power benefits (000 k.w. installed)</i>		<i>Cost of irrigation per acre- (Rs.)</i>
<i>During the plan period (000' acres)</i>	<i>On completion (000' acres)</i>	<i>During the plan period</i>	<i>On completion</i>	
6	7	8	9	10
38	38	...	...	507.8
712	740	...	...	97.16
832	1,176	...	...	109.94
<u>1,582</u>	<u>1,954</u>	<u>...</u>	<u>...</u>	<u>112.84</u>
40	60	...	...	155.0
362	434	...	...	135.9
348	358	...	...	204.2
<u>750</u>	<u>852</u>	<u>...</u>	<u>...</u>	<u>165.9</u>
261	1,785	48	123	357.4
502	502	...	...	80.1
<u>763</u>	<u>2,287</u>	<u>...</u>	<u>...</u>	<u>296.5</u>
595	1,141	194	274	194.7
600	600	4	4	243.0
46	46	...	...	228.3
26	26	...	...	380.8
333	333	...	...	56.1
<u>1,600</u>	<u>2,146</u>	<u>...</u>	<u>...</u>	<u>190.0</u>
218	218	...	...	91.7
<u>218</u>	<u>218</u>	<u>...</u>	<u>...</u>	<u>91.7</u>
<u>3,331</u>	<u>5,503</u>	<u>...</u>	<u>...</u>	<u>226.5</u>

**Table 3—Major Irrigation
(Detailed statement)**

<i>Name of the project</i>	<i>Date begun</i>	<i>Date of completion</i>	<i>Cost during the plan period (Rs. Lakhs)</i>	<i>Total cost (Rs. Lakhs)</i>
I	2	3	4	5
III—SOUTH INDIA				
Madras				
Lower Bhavani	1948	1954	494	961
Malampuzha	1949	1954	302	380
Mettur Canal	1949	1954	277	245
Manimuthar	1951	1955	392	398
Bhairavanitippa	1951	1955	102	102
Araniyar	1951	1955	95	95
Walyar	1951	1955	100	100
Tungabhadra	1945	1953	1,140	1,970
Other Irrigation Schemes . . . . .	...	...	506	709
TOTAL			3,408	4,960
Mysore				
Bhadra Project (1st Stage)	1947	1955-56	186	2,000
Tunga Anicut	1946	1955-56	149	200
Negu Reservoir	1947	1955-56	190	220
Other Irrigation Schemes . . . . .	...	...	181	289
TOTAL			706	2,709
Travancore-Cochin				
Peechi	1948	1952-53	110	173
Chalakydy	1949	1952-53	98	120
Neyyar	1951	1954-55	120	120
Other Irrigation Schemes . . . . .	...	...	150	197
TOTAL			478	610
ZONE TOTAL			4,592	8,279
IV—WEST INDIA				
Bombay				
Gangapur	1949	1957	234	334
Ghataprabha left bank canal	1949	1957	445	545
Mahi right bank canal	1948	1956	401	425
Lower Tapti Valley Stage I	1949	1955-56	1,151	1,216
Other Irrigation Schemes . . . . .	...	...	38	45
TOTAL			2,269	2,565
Saurashtra				
Machhu	1949	...	43	125
Brahmani	1949	1956	85	100
Other Irrigation Schemes . . . . .	...	...	346	577
TOTAL			474**	802*
Kutch				
Irrigation Schemes	1950	1955-56	91	91
TOTAL			91	91
ZONE TOTAL			2,834**	3,458*

§ In the case of these Projects, the cost of irrigation is really some what less, because in the expenditure figures in columns 4 and 5 include expenditure on penstock pipes etc. necessary for the development of power at a future date.

SOURCE: PLANNING COMMISSION : Development Schemes in the First Five Year Plan Statement V.

**Excluding Shetrunji and Bhadar, which would be taken up after the plan period

**Development Plan Projects
for India, by Zones)**

Irrigation benefits		Power benefits (000' k. w. installed)		Cost of irrigation per acre (Rs.)
During the plan period (000' Acres)	On completion (000' Acres)	During the plan period	On completion	
6	7	8	9	10
150	207	...	...	464.28
30	40	...	...	950.08
40	45	...	...	544.4
15	20	...	...	1,990.0
5	8	...	...	1,275.0
3	3	...	...	3,166.6
3	7	...	...	1,428.8
165	250	...	...	788.0
24	28	...	...	2,532.1
435	608	...	...	815.8
...	180	...	...	1,111.18
10	21	...	...	952.3
...	20	...	...	1,100.0
20	29	...	...	996.5
30	250	...	...	1,083.6
...	46	...	...	376.1
...	50	...	...	240.0
...	31	...	...	987.1
17	41	...	...	480.5
17	168	...	...	363.1
482	1,026	...	...	806.92
15	45	...	...	742.2
45	100	...	...	545.0
16	90	...	...	472.2
391	652	...	...	186.5
7	6	...	...	750.0
474	893	...	...	287.2
22	22	...	...	568.2
27	27	...	...	370.3
59	71	...	...	812.7
108*	120****	...	...	668.3
30	38	...	...	239.5
38	38	...	...	239.5
620*	1,051****	...	...	329.0

**Table 3—Major Irrigation
(Detailed statement)**

Name of the project	Date begun	Date of completion	Cost during the plan period (Rs. Lakhs)	Total cost (Rs. Lakhs)
1	2	3	4	5
V—CENTRAL INDIA				
Madhya Pradesh				
Dudhwa	1952-53	1956-57	113	150
Other Irrigation Schemes . . . . .	...	...	195	219
TOTAL			308	369
Madhya Bharat				
Irrigation Schemes . . . . .	...	...	328	339
TOTAL			328	339
Hyderabad				
Tungabhadra	1945	1957	1,709	2,304
Rajolibunda	1947	1955	314	430
Godavari 1st Phase	1949	1955	359	441
Other Irrigation Schemes . . . . .	...	...	197	251
TOTAL			2,579	3,426
ZONE TOTAL			3,215	4,134
VI—NORTH-WEST INDIA				
Rajasthan				
Jawai Project	1946	1956	203	328
Other Irrigation Schemes . . . . .	...	...	301	748
TOTAL			504	1,076
Punjab (I)				
Bhakra Nangal	1946	1960	...	12,320†
Harike	1949	1954-55	1,062	1,491
Tube-wells . . . . .	...	...	110	155
Other Irrigation Schemes . . . . .	...	...	216	277
TOTAL				12,752*
PEPSU				
Irrigation Schemes . . . . .	...	...	34	36
TOTAL			34	36
Ajmer				
Irrigation Schemes . . . . .	...	...	11	11
TOTAL			11	11
Himachal Pradesh				
Irrigation Schemes . . . . .	...	...	80	80
TOTAL . . . . .	...	...	80	80
ZONE TOTAL			80	13,955

*Excluding Harike.
†Cost of irrigation only.
N.A. Not Available.

**Development Plan Projects
for India by Zones)**

<i>Irrigation benefits</i>		<i>Power benefits (000' k. w. installed)</i>		<i>Cost of irrigation per acre (Rs.)</i>
<i>During the plan period (000' Acres)</i>	<i>On completion (000' Acres)</i>	<i>During the plan period</i>	<i>On completion</i>	
6	7	8	9	10
40	90	...	...	166.6
74	94	...	...	233.0
<u>114</u>	<u>184</u>	...	...	<u>200.5</u>
83	152	...	...	223.0
<u>83</u>	<u>152</u>	...	...	<u>223.0</u>
100	450	...	...	512.0
35	79	...	...	544.3
40	53	...	...	832.1
131	149	...	...	168.4
<u>306</u>	<u>731</u>	...	...	<u>468.6</u>
<u>503</u>	<u>1,067</u>	...	...	<u>387.4</u>
40	46	...	...	713.08
203	777	...	...	96.3
<u>243</u>	<u>823</u>	...	...	<u>130.1</u>
1,361	3,604	96	144	143.2
...
124	136	...	...	114.0
604	700	...	...	39.6
<u>2,089</u>	<u>4,440</u>	...	...	<u>287.2</u>
...	129	...	...	27.9
...	129	...	...	27.9
N. A.	N. A.	...	...	N. A.
N. A.	N. A.	...	...	N. A.
75	100	...	...	80.0
75	100	...	...	80.0
<u>2,407</u>	<u>5,492</u>	...	...	<u>254.0</u>

Table 4—Minor Irrigation Plan Projects in the First-Five Year Plan.

State	Costs of minor irrigation (Rs. Lakhs)	Area irrigated (in 000' Acres)	Cost per acre of area irrigated (Rs.) Col. 2/3.
1	2	3	4
I—North India	480	1,110	43.24
Uttar Pradesh	480	1,110	43.24
II—East India	1,174*	4,225	30.97*
Bihar	791	2,086	37.92
Orissa	N. A.	434	N. A.
West Bengal	271	933	29.05
Assam	106	770	13.77
Tripura	6	2	300.00
III—South India	1,426	763	186.89
Madras	785	556	141.19
Mysore	261	169	154.44
Travancore-Cochin	380	38	1000.00
Coorg	...	...	...
IV—West India	835	797	104.77
Bombay	684	582	117.53
Saurashtra	100	105	95.24
Kutch	51	110	46.36
V—Central India	639	524	121.95
Madhya Pradesh	396	86	460.47
Madhya Bharat	100	40	250.00
Hyderabad	23	330	6.97
Bhopal	75	59	127.12
Vindhya Pradesh	45	9	500.00
VI—North-West India	121†	857	15.63†
Rajasthan	6	193	3.11
Punjab	55	243	22.63
PEPSU	30	310	9.68
Ajmer	14	7	200.00
Delhi	12	11	109.09
Bilaspur	4	10	40.00
Himachal Pradesh	N. A.	83	N. A.
TOTAL INDIA	4,675%	8,276	60.25 %
SUPPLEMENTARY SCHEMES.	3,000	3,000	100
GRAND TOTAL	7,675%	11,276	71.34 %

* Excluding Orissa.

† Excluding Himachal Pradesh.

% Excluding Orissa and Himachal Pradesh both.
N. A. Not available.

PART B

Note on analysis of costs and results of major Irrigation projects

1. The total amount of capital outlay on all major irrigation projects of undivided India was 142 crores. [This includes direct and indirect charges of construction but it is not the 'sum-at-charge' which includes interest on capital outlay, unrecovered by net revenue returns.] It is reckoned, that the entire total of capital outlay attributable to irrigation within the present boundaries on India is only 81 crores.

2. From this it follows that the capital outlay required for extension of irrigation worked out to Rs. 54.5 only. Let us refer to this sum as the 'unit cost of major irrigation development'. This is an average for all projects constructed at different periods of time. If we separate the projects by periods we find that the unit cost of major irrigation development in India increased as follows : Rs. 31.15 before 1891, Rs. 58.6 during 1891-1920, and Rs. 101.5 during 1921-40. It is interesting to compare these figures with the corresponding figures for projects in each zone, as well as for projects now in Pakistan :

TABLE I

Zones	<i>Unit cost of major irrigation development on projects constructed</i>						
	Before 1891		During 1891-1920		During 1921-1940		
	Rs.	As.	Rs.	As.	Rs.	As.	
North India	33	5	61	11	71	1	
East India	52	10	90	10	...	...
South India	47	8	43	15	312	7	
West India	241	15	206	3	383	2	
Central India	..	..	115	2	96	4
North-West India	13	12	22	5	46	7	
INDIA	Rs.	31.15	58	6	101	5	
PAKISTAN	Rs.	14	10	32	5	69	11

3. There are two distinct features about figures of TABLE I to which attention should be invited:

First.—There are large differences in unit cost between different parts of the country,

even in respect of projects undertaken in the same period. They reflect natural differences in the availability of water ; the need or absence of need for storage works ; the distances over which water has to be led before use and the suitability of terrain over which water has to be taken ; and so.

Secondly.—The unit cost increases from each period to the next. There are two possible causes for such increase. The main reason is easier projects are normally taken up first. Those which present difficulties of storage, higher lifts and longer leads come later. Therefore, the real costs (in terms of labour and materials) necessarily increase with time. The other reason is the fall in the value of money, or rise in the price of materials and labour. There has been a gradual trend of this nature, operating from about the middle of the last century. But the increase has, on the whole, been much smaller than the extraordinary increase which has occurred within the last decade. If we took into account the unduly low level of prices during the thirties, there is no good reason to suppose that the value of money had fallen during the third period as compared with the second. But yet there was a substantial increase* of the unit cost. Obviously this shows that the real cost (in terms of labour and materials) was increasing.

4. So much for costs ; now for the returns. There are two kinds of returns to be considered in relation to every irrigation project— whether major or minor. One is the increase in agricultural productivity consequent on the increase in irrigated area created by the project. The other is the 'net revenue return', that is to say, the proceeds of the sale of water to the cultivators less the cost of maintenance and operation of the project. One is dependent on the other ; for the price which the cultivator can be expected to pay for water supplied to him depends on the price which he gets for increased produce attributable to irrigation. Though one is thus dependent on the other, the two are not in exact proportion to one another ; because the relation-

*The increase is small in North India. There is a special reason for it. During the last period, an entirely new type of irrigation through power-operated tubewell projects was developed, which involved low capital outlay and high costs of operation. If the cost of these works is to be compared properly with the normal types of canal or tank irrigation, the present value of recurring future costs of operation should be added to the initial capital outlay.

ship between Government and the cultivators in respect of water-supply from a public works is not quite the same as that of shopkeepers and customers. The charge for water supplied has to be related to the general framework of land revenue administration and fixed largely, though not entirely, without reference to the cost of production of water:

In the past, estimates for projects invariably provided for a most meticulous calculation of the 'net revenue return'. The anticipated increase in area to be irrigated was carefully arrived at because it was the most important element in determining the net revenue return. The further step of computing the increase of agricultural productivity from the increase in irrigated area was rarely taken.

The position is now reversed in relation to the projects of the First Five Year Plan, mainly because we are concentrating on the results in terms of new irrigation and treating the net revenue return as a subsidiary issue.

5. The trend of net revenue returns on old projects is interesting and revealing. For all projects taken as a whole, the net revenue return expressed as a percentage of the capital outlay was 6.3 per cent. in India and 11.1 per cent. in Pakistan. The corresponding percentages for projects divided by periods and zones, are shown in the table below :

TABLE 2

Zones	Net revenue returns (as percentages of capital outlay) on projects constructed		
	Before 1891	During 1891-1920	During 1921-40
North India .	13.1	2.0	3.4
East India .	6.7	0.7	...
South India .	9.2	9.2	2.5
West India .	4.2	4.2	2.8
Central India .	...	0.8	0.9
North-West India .	18.3	13.2	10.0
INDIA .	11.6	5.0	3.2
PAKISTAN .	14.8	19.6	5.8

Except for the special case of power-operated tubewell project of North India, the general trend

is one of steadily decreasing profitability. This fact is brought out in another way also by the figures of accumulated interest arrears and accumulated surplus revenue shown below :

TABLE 3

Period of construction	Accumulated interest arrears	Accumulated surplus revenue
	(IN CRORES) Rs.	(IN CRORES) Rs.
INDIA		
Before 1891	6.3	66.1
1891-1920	16.2	24.5
1921-1940	16.0	0.2
PAKISTAN		
Before 1891	0.5	13.1
1891-1920	4.9	78.5
1921-1940	0.9	1.2

6. The figures of the TABLES 1, 2 and 3 provide the clearest possible demonstration of the operation of what economists call the 'law of diminishing returns'. The easier projects which are taken up first not only cost less to construct ; they yield the best returns—for water is brought to virgin land with fertile soil which lay waste. The increase in productivity attributable to irrigation is very large. As time passes unirrigated cultivation is extended over large areas and virgin land with fertile soil becomes scarce. It costs more to construct the new projects because there are higher lifts and longer leads to manage before water can reach the land to be irrigated. But the increase of productivity secured at the other end is smaller, because the area to be newly irrigated consists, to an increasing extent of land which is already under unirrigated cultivation and yields crops. In fact it becomes necessary to use up a good deal of cultivated land, as the water spread of reservoirs or sites on which embankments are constructed or channels are dug. Furthermore, in many cases, the cultivator is put to expense and effort in order to adapt the land for purposes of irrigated cultivation. Instances are not wanting of major irrigation projects where the State has had not only to bear the cost of construction of the project but also to subsidise the cultivators in order to induce them to lower the level of the land to be irrigated and take other steps necessary for efficiently using the water supply made available. All this diminishes the net increase

of productivity, net profitability to the cultivator, and therefore, the net revenue returns.

7. We must have the lessons of this past experience before us in order correctly to appreciate the financial implications of the major irrigation projects of the First Five Year Plan.

There is some difficulty of comparison because we are dealing with the 'actuals' for the past, and 'estimates' only for the future. But this cannot be helped.

The total capital outlay on all major irrigation projects undertaken during a century was Rs. 81 crores. The total capital outlay during the last period 1921-40 was Rs. 35 crores. Against this must be set the estimated total cost on all major irrigation projects of the First Five Year Plan—Rs. 445 crores. This may strike as extraordinarily costly, until comparison is reduced to that of unit costs.

The estimated unit cost of development under the First Five Year Plan is Rs. 276-8. The actual unit cost for the last period 1921-40 was Rs. 101-5. The corresponding figures for zones are shown in the table below :

TABLE 4

Zones	Unit cost of major irrigation development	
	Actuals during 1921-1940	Estimate of the First Five Year Plan
	Rs. As.	Rs. As.
North India	71 1	112 14
East India	...	226 8
South India	312 7	806 15
West India	383 2	329 0
Central India	96 4	387 7
North-West India	46 7	254 0
INDIA	101 5	276 8

In comparing the two sets of unit costs, we should remember two factors :

First,— the difference in the present level of prices and wages and that of 1921-40.

Secondly,— the trend already clearly established, that of increasing *real costs*, as the easier works are constructed earlier. It is clear that the

real occasion for surprise is not that the estimated costs are so high; but that they do not appear to be high enough and, therefore, suggest the likelihood that the actuals would turn out to be in excess of the estimates.

8. It has been mentioned already that no figures of estimated 'net revenue returns' are yet available for the major irrigation projects under the First Five Year Plan.

The past actuals, as mentioned already, show a diminishing trend from 11.7 per cent on projects constructed in the first period to 5.0 per cent on projects constructed in the second period and then to 3.2 per cent on the projects constructed in the third period.

Can we form some idea, from these figures, of the probable net revenue returns on the major irrigation projects of the First Five Year Plan. We know that the estimated unit cost is 2.7 times the actual unit cost during 1921-40. Let us assume (a) that the actuals will be equal to the estimates and, (b) that the average rate per acre of irrigation charged to the cultivator will be so fixed as to yield the same 'net revenue return' per acre as during 1921-40. Then, the 'net revenue return' will work out to about 1.2 per cent. It will be necessary to levy a charge for the use of water well in excess of three times the old level of charges, in order that the increased costs of maintenance and operation can be met and a net revenue return of the order of 3.2 per cent can be secured.

The Governments concerned are known to be considering the levy of most adequate rates, 'betterment fees' etc., with due regard to the large increase in the prices of foodgrains and other agricultural produce.

But there are obvious limits fixed partly by political considerations and partly also by strictly economic considerations which always limits the realisable revenue to a fraction of the increase of prices. For these reasons and the likelihood, already mentioned, of the actuals exceeding the present estimates of total cost of these projects, it is prudent to expect that the net revenue returns will fall short of the minimum necessary for rendering the projects self-financing.

If we can determine the 'net revenue returns' after the irrigation charges are fixed, and compute their present value; and deduct this present

value (along with betterment fees and other non-recurring receipts and recoveries) from the capital outlay in these projects, we shall arrive at a figure which represents the 'net unremunerative outlay' involved.

9. The fact that public works designed to provide irrigation will involve a significant amount of 'net unremunerative outlay' is important; for it makes the real break with the past.

The development of irrigation was regulated in the past by the fact that the projects had to be profit-making or at least self-financing. It is true that un-profitable works were also constructed; but these were exceptions, governed by very strict rules. They could only be undertaken in areas liable to scarcity or famine; and even then the loss involved was to be compared with probable gain in the avoidance or reduction of expenditure on famine relief.

The possibilities of development on such a basis were getting exhausted. It is unlikely that there are any now with the possible exception of some of the most backward areas, formerly under princely rule. The State has not now got to discard the old limitation. It has to incur a 'net unremunerative outlay' over and above a self-financing outlay.

It has to do this because, there is an over-riding need for the additional productivity which the project helps to secure. The *net Unremunerative outlay* on public works is the price paid by

the nation as a whole for securing this increase of productivity. It is much the same nature as the subsidies which experience has shown to be necessary if cultivators are to be induced to construct wells or other private irrigation works. There was a time not long ago, when such works were constructed in large numbers without any assistance—or with the help only of State Loans. The possibilities of such development are now exhausted. Further development requires subsidisation on a scale sufficient to reduce the net cost to the cultivator to a point at which it would be profitable for him to incur it.

10. That a situation in which public works of irrigation have ceased to pay their way is not limited to India may be seen from the following passage from the report of the Hoover Commission in the United States of America;

"The Congress, in setting up the irrigation system, provided that farmers should repay the costs of the system, without interest added to the cost during construction or subsequent interest on the cost. Experience has shown, however, that even with this indirect subsidy of interest, these projects on the average, do not pay out, as the capital cost is too great (with a few exceptions) for the farmers to bear. It is simply accepted that the national advantage of more farm houses and more national productivity are advantages which will offset Government losses".

APPENDIX -- VII
MATERNITY DATA AND BIRTH CONTROL

APPENDIX VII—Maternity

Part A—Maternity

Table I—Child birth and child survival

Age of mother on 1-3-51→ Economic Classification/Natural divisions		CHILD BIRTH INDICES							
		Still married mothers							
		All Ages	Under 20	20-24	25-29	30-34	35-39	40-44	45 and Over
1	2	3	4	5	6	7	8	9	
GENERAL	East Madhya Pradesh	4.2	1.4	2.0	3.1	4.3	5.3	5.8	6.1
	N-W Madhya Pradesh	4.2	1.2	2.1	3.2	4.3	5.3	5.9	6.3
	S-W Madhya Pradesh	4.3	1.3	2.1	3.3	4.5	5.5	6.2	6.6
	Travancore-Cochin	4.3	1.2	1.8	2.9	4.2	5.3	6.2	6.6
RURAL	East Madhya Pradesh	4.3	1.4	2.0	3.1	4.3	5.8	5.8	6.1
	N-W Madhya Pradesh	4.2	1.3	2.1	3.1	4.3	5.2	5.8	6.2
	S-W Madhya Pradesh	4.3	1.3	2.1	3.3	4.5	5.5	6.2	6.6
	Travancore-Cochin	4.3	1.2	1.7	2.9	4.1	5.3	6.2	6.6
	West Bengal I	3.9	1.4	2.1	3.3	4.5	5.2	5.8	6.0
West Bengal II	3.9	1.4	2.4	3.7	4.8	5.7	6.2	6.1	
URBAN	East Madhya Pradesh	4.0	1.4	2.1	3.1	4.3	5.0	5.8	6.3
	N-W Madhya Pradesh	4.4	1.4	2.6	3.3	4.7	5.8	6.3	6.7
	S-W Madhya Pradesh	4.2	1.3	2.1	3.3	4.4	5.6	6.0	6.4
	Travancore-Cochin	4.2	1.2	1.9	3.0	4.2	5.4	5.9	6.4
Families of agricul- rural land holders and tenants	East Madhya Pradesh	3.4	1.4	2.0	3.2	4.3	5.3	5.7	6.1
	N-W Madhya Pradesh	4.2	1.3	2.0	3.1	4.3	5.2	5.8	6.2
	S-W Madhya Pradesh	4.4	1.3	2.2	3.5	4.6	5.5	6.2	6.8
	Travancore-Cochin	4.5	1.2	1.7	2.9	4.2	5.3	6.2	6.7
Families of agricul- tural labourers	East Madhya Pradesh	4.2	1.3	2.0	3.1	4.6	5.4	6.3	6.0
	N-W Madhya Pradesh	4.0	1.3	2.0	3.0	4.2	5.1	5.7	5.8
	S-W Madhya Pradesh	4.2	1.3	2.1	3.1	4.3	5.4	6.1	6.4
	Travancore-Cochin	4.1	1.2	1.7	2.8	4.0	5.1	6.0	6.3
Non-agricultural families	East Madhya Pradesh	4.1	1.3	2.0	3.1	4.2	5.1	5.6	6.3
	N-W Madhya Pradesh	4.3	1.5	2.4	3.3	4.6	5.7	6.3	6.7
	S-W Madhya Pradesh	4.2	1.3	2.1	3.3	4.5	5.6	6.2	6.4
	Travancore-Cochin	4.2	1.2	1.8	3.0	4.2	5.5	6.2	6.6

NOTE:— (1) West Bengal I : It includes Birbhum, Bankura, Howrah, 24-Parganas, Malda and Dinajpur.
West Bengal II : It includes Burdwan, Nadia, Murshidabad and Jalpaiguri.
(2) Age- grouping of West Bengal II is : Under 21, 21-25, 26-30, 31-35, 36-40, 41-45, 46 and over.

data and Birth Control

Statistics

in parts of India (1951 Census data)

CHILD SURVIVAL INDICES

Widowed or divorced mothers		Still married mothers								Widowed or divorced mothers	
All Ages	45 and over	All Ages	Under 20	20-24	25-29	30-34	35-39	40-44	45 and over	All Ages	45 and over
10	11	12	13	14	15	16	17	18	19	20	21
5.3	5.7	2.6	1.0	1.3	2.0	2.8	3.3	3.6	3.6	3.0	3.2
5.3	5.7	2.5	1.0	1.3	2.0	2.6	3.2	3.4	3.6	2.8	2.9
5.4	5.8	2.5	0.9	1.4	2.0	2.7	3.3	3.6	3.6	2.6	2.7
4.9	5.5	3.2	1.0	1.4	2.3	3.2	4.0	4.6	4.6	3.1	3.5
5.4	5.7	2.7	0.9	1.3	2.0	2.8	3.3	3.6	3.6	3.1	3.2
5.3	5.7	2.5	0.9	1.3	1.9	2.6	3.1	3.4	3.5	2.8	2.9
5.5	5.9	2.5	0.9	1.4	2.0	2.7	3.2	3.5	3.5	2.6	2.8
4.9	5.5	3.2	1.0	1.4	2.3	3.2	4.0	4.6	4.6	3.2	3.5
...	...	2.7	1.0	1.6	2.3	3.3	3.7	3.9	3.9	...	...
...	...	2.6	1.9	1.8	2.6	3.2	3.8	3.9	3.6	...	...
5.0	5.5	2.5	1.1	1.5	2.0	2.8	3.2	3.6	3.6	2.6	2.8
5.2	5.5	2.6	1.1	1.4	2.2	2.9	3.5	3.8	2.6	3.7	2.7
5.1	5.5	2.7	0.9	1.5	2.2	2.9	3.4	3.8	3.6	2.6	2.7
4.8	5.3	3.1	1.0	1.5	2.4	3.2	4.0	4.3	4.4	3.4	3.3
5.4	5.7	2.7	1.0	1.4	2.0	2.8	3.3	3.6	3.6	3.1	3.2
5.3	5.7	2.5	0.9	1.3	1.9	2.6	3.2	3.4	3.6	2.9	3.0
5.3	5.7	2.6	0.9	1.5	2.1	2.8	3.3	3.5	3.6	2.6	2.7
4.9	5.4	3.4	1.0	1.4	2.4	3.4	3.4	4.2	4.8	3.3	3.5
5.3	5.8	2.6	0.9	1.3	2.0	2.9	3.4	4.0	3.5	3.1	3.4
5.2	5.5	2.3	0.9	1.3	1.8	2.5	2.9	3.2	3.2	2.7	2.8
5.5	6.0	2.4	0.9	1.3	1.8	2.5	3.1	3.4	3.4	2.7	2.8
4.9	5.5	2.9	0.9	1.3	2.1	2.9	3.7	4.2	4.1	3.0	3.3
5.2	5.6	2.5	0.9	1.4	2.0	2.7	3.2	3.4	3.7	2.7	2.9
5.4	5.7	2.5	1.1	1.4	2.1	2.7	3.4	3.6	3.6	2.7	2.8
5.2	5.6	2.6	0.9	1.4	2.2	2.8	3.4	3.7	3.6	2.6	2.7
4.9	5.5	3.1	1.0	1.5	2.3	3.2	4.1	4.5	4.5	3.1	3.5

Table 2— Number per 1,000 births, by order and age of mother

Territories	Number per 1,000 births by order of birth					Number per 1,000 births by age of mother				
	First order births	Second order births	Third order births	First, second and third order births	Births of fourth and higher order	10-14	15-24	25-34	35-44	45 and over
I	2	3	4	5	6	7	8	9	10	11
INDIA :										
27 districts of South India (Madras and Coorg)	228	215	181	624	376	1	438	427	124	10
7 districts of West India (Bombay, Saurashtra and Kutch)	209	180	167	556	444	2	391	446	150	11
22 districts of Central India, (Madhya Pradesh, Madhya Bharat and Vindhya Pradesh)	210	189	162	561	439	4	436	415	133	12
5 districts of North-West India (Punjab and Rajasthan)	231	206	151	588	412	12	412	432	137	7
Thirty Municipal Towns	209	196	167	572	428	6	417	441	131	5
U.S.A.	395	284	143	822	178	...	409	477	113	1
U. K.	423	300	137	860	140	...	254	557	186	3

NOTE.—This table has been compiled from the results of the Experimental Census of Births and Deaths, 1952. Data compiled earlier by Shri S. P. JAIN for this study in birth order statistics of India are also shown for purposes of comparison.

Table 3—Number of children born after completion of childbearing age—Great Britain

Year of marriage	Average number of live births (to marriages of completed fertility)			Percentage of marriages		
	All marriages	All except child- less marriage	With 4 or more children	With one, two or three children	Which were childless	
1	2	3	4	5	6	
1860 (about)	5.7	6.3	72	19	9	
1900-1909	3.6	4.0	41	49	10	
1910	3.1	3.5	35	53	12	
1915	2.6	3.0	26	60	14	
1920	2.6	3.0	25	61	14	
1925	2.2	2.7	19	65	16	
1927-1931	2.4	2.7	21	67	12	
1932-1936	2.1	2.4	15	71	14	

NOTE:—This table has been compiled from data set out in Tables XV and XVII at pages 25 and 26 of Report of Royal Commission on Population (Vol. 1) and Table II at page 108 of Reports and selected papers of the Statistics Committee (Vol II, Papers of the Royal commission) and Table X 3@ in the Census, 1951—one per cent. Sample Tables, Part II of Great Britain.

Table 4—Distribution of family size for cohorts of completed fertility, standardised for age at marriage for women marrying at under 45 years of age—Great Britain
(CORRECTED FOR UNDERSTATEMENT OF CHILDLESSNESS)

Total number of live births	Marriages per 1,000 with following numbers of live births (Census data)				
	Year of first marriage				
	1900-09	1910	1915	1920	1925
0	113	121	150	142	166
1	148	170	212	218	251
2	187	205	234	236	251
3	156	171	159	161	142
4	120	111	95	95	77
5	84	74	59	55	46
6	62	53	35	34	28
7	45	34	21	23	18
8	31	24	14	15	10
9	22	15	9	8	6
10	15	10	6	6	4
11	8	6	3	3	1
12	5	4	2	2	...
13	2	1	1	1	...
14 and over	2	1	...	1	...
TOTAL	1,000	1,000	1,000	1,000	1,000

Table 5—Number per 1,000 births by order of birth in various countries of the world

<i>Country/Year</i>	<i>First order births</i>	<i>Second order births</i>	<i>Third order births</i>	<i>First, second and third order births</i>	<i>Births of fourth and higher order</i>
1	2	3	4	5	6
NORTH AMERICA					
Canada					
1936	253	191	135	579	421
1937	266	198	135	599	401
1938	282	206	134	622	378
1939	302	210	134	646	354
1940	317	218	135	670	330
1941	342	216	132	690	310
1942	344	227	131	702	298
1943	338	233	139	710	290
1944	317	237	146	700	300
1945	308	238	150	696	304
1946	327	244	148	719	281
1947	345	244	146	735	265
1948	313	255	155	723	277
U. S. A.					
1936	357	230	134	721	279
1937	370	233	133	736	264
1938	377	239	132	748	252
1939	375	245	135	755	245
1940	372	253	137	762	238
1941	391	250	135	776	224
1942	412	253	130	795	205
1943	373	272	143	788	212
1944	345	270	155	770	230
1945	341	269	156	766	234
1946	382	275	142	799	201
1947	416	267	138	821	179
1948	373	290	150	813	187
1949	341	301	160	802	198
Virgin Islands					
1940	245	213	140	598	402
SOUTH AMERICA					
Chile					
1940	297	192	142	631	369
ASIA					
Israel					
1949	412	308	147	867	133
1950	331	319	161	811	189

Table 5—Number per 1,000 births by order of birth in various countries of the world—contd.

Country/Year	First order births	Second order births ^A	Third order births	First, second and third order births	Births of fourth and higher order
1	2	3	4	5	6
Japan					
1947	286	203	152	641	359
1948	322	194	146	662	338
OTHER AREAS					
Cyprus					
1948	258	215	171	644	356
1949	227	245	178	650	350
1950	235	228	181	644	356
EUROPE					
Belgium					
1941	352	257	153	762	238
1945	386	265	145	796	204
1946	448	256	128	832	168
1947	448	226	130	804	196
1948	431	246	130	807	193
1949	417	253	137	807	193
1950	399	264	143	806	194
Denmark					
1936	364	247	146	757	243
1937	371	253	142	766	234
1938	366	262	146	774	226
1939	365	265	150	780	220
1940	377	268	147	792	208
1941	375	262	150	787	213
1942	364	278	155	797	203
1943	365	281	157	803	197
1944	358	283	163	804	196
1945	357	284	163	804	196
1946	325	305	175	805	195
1947	322	297	177	796	204
1948	319	295	179	793	207
1949	319	297	179	795	205
1950	323	296	178	797	203
Finland					
1939	357	224	138	719	281
1940	354	220	141	715	285
1941	327	246	150	723	277
1942	344	224	152	720	280
1943	324	234	156	714	286
1944	364	228	146	738	262
1945	386	242	142	770	230
1946	414	234	137	785	215
1947	383	260	141	784	216
1948	348	273	154	775	225
1949	322	267	169	758	242

Table 5—Number per 1,000 births by order of birth in various countries of the world—contd.

Country/Year	First order births	Second order births	Third order births	First, second and third order births	Births of fourth and higher order
1	2	3	4	5	6
France					
1936	328	258	158	744	256
1938	327	257	159	743	257
1939	327	254	158	739	261
1940	289	237	165	691	309
1941	278	251	169	698	302
1942	317	244	159	720	280
1943	346	242	150	738	262
1944	324	260	156	740	260
1945	321	267	158	746	254
1946	388	267	149	804	196
1947	430	242	140	812	188
1948	387	273	147	807	193
1949	344	297	162	803	197
Germany					
1937	369	277	152	798	202
West Berlin					
1950	541	280	104	925	75
1951	553	276	102	931	69
Federal Republic					
1948	452	280	132	864	136
1949	447	291	135	873	127
1950	443	294	139	876	124
Hungary					
1937	332	217	146	695	305
Italy					
1936	253	208	157	618	382
Luxembourg					
1947	453	248	138	839	161
Netherlands					
1937	293	218	145	656	344
1938	302	222	146	670	330
1939	300	229	149	678	322
1940	315	224	145	684	316
1941	319	225	148	692	308
1942	300	235	153	688	312
1943	312	236	156	704	296
1946	271	265	179	715	285
1947	309	220	172	701	299
1948	284	239	163	686	314

Table 5. Number per 1,000 births by order of birth in various countries of the world—contd.

Country/Year	First order births	Second order births	Third order births	First, second and third order births	Births of fourth and higher order
1	2	3	4	5	6
1949	289	244	160	693	307
1950	284	244	166	694	306
Norway					
1936	383	232	136	751	249
1937	402	240	134	776	224
1938	418	246	135	799	201
1939	422	252	132	806	194
1940	432	250	133	815	185
1941	443	242	129	814	186
1942	428	265	132	825	175
1943	419	280	138	837	163
1944	392	303	148	843	157
1945	371	303	163	837	163
1946	337	324	164	825	175
1947	371	296	167	834	166
1948	374	287	169	830	170
1949	376	293	162	831	169
1950	375	294	165	834	166
Portugal					
1947	276	205	153	634	366
1948	268	208	155	631	369
1949	275	208	156	639	361
Switzerland					
1937	375	251	147	773	227
1941	385	256	147	788	212
1945	362	276	167	805	195
1946	360	276	168	804	196
1947	368	268	164	800	200
1948	373	267	163	803	197
1949	369	270	165	804	196
1950	366	272	165	803	197
England and Wales					
1939	419	259	130	808	192
1940	432	250	131	813	187
1941	445	237	131	813	187
1942	455	252	125	832	168
1943	448	271	125	844	156
1945	400	297	144	841	159
1946	422	299	138	859	141
1947	445	295	133	873	127
1948	415	309	141	865	135
1949	400	320	146	866	134
1950	383	319	155	857	143

Table 5—Number per 1,000 births by order of birth in various countries of the world—concl'd.

<i>Country/Year</i>	<i>First order births</i>	<i>Second order births</i>	<i>Third order births</i>	<i>First, second and third order births</i>	<i>Births of fourth and higher order</i>
1	2	3	4	5	6
Scotland					
1945	370	264	143	777	223
1946	395	265	144	804	196
1947	415	261	141	817	183
1948	386	283	145	814	186
1949	377	286	149	812	188
1950	364	288	157	809	191
OCEANIA					
Australia					
1936	373	243	144	760	240
1937	379	248	143	770	230
1938	386	258	143	787	213
1939	391	263	142	796	204
1940	395	270	141	806	194
1941	404	268	142	814	186
1942	403	268	145	816	184
1943	410	268	147	825	175
1944	367	288	159	814	186
1945	368	286	165	819	181
1946	378	288	160	826	174
1947	399	281	157	837	163
Newzealand					
1936	380	252	148	780	220
1938	409	258	143	810	190
1939	414	268	143	825	175
1940	418	275	144	837	163
1941	403	283	155	841	159
1943	324	274	195	793	207
1945	324	258	194	776	224
1948	361	289	165	815	185
1949	338	310	172	820	180
1950	324	305	184	813	187
Hawaii					
1940	313	225	142	680	320

NOTE :—This table has been compiled from Table 12—Birth rates by order of births—in the Demographic Year Book 1952 of the United Nations.

PART B

A note on "Maternity and Child Welfare Services"—by Dr. T. Lakshminarayana, M.B.B.S., B.S. Sc. D.P.H. (Lond.) Adviser, Health Programmes, Planning Commission.

1. Objects

To provide this essential service in the most economic way utilising the services of local practitioners of traditional midwifery usually known as '*dais*'; to make it the basis for all other health services, in particular, to effectively reach the homes of the people and to educate them in all matters relating to the health and welfare of the family and the community including instructions on family planning. The scheme is formulated for the rural areas but would apply with suitable modifications to urban areas.

2. Organisation

It may be expected that there is one woman in a village practising as a *dai*, the average population of a village being assumed as 500. The *dais* constitute the basic workers. They should be trained in simple aseptic techniques and elements of midwifery. Their work should be guided and supervised by trained staff. There should be a minimum of one midwife for 10 *dais* or for 5,000 population. Such a population will give the number of births which a midwife can possibly manage, if she is attending only to the work of conducting labour, but she would be invested with the duty of supervising the work of *dais*, of home visits, of educational work and of conducting the work at the Child Welfare Centre. Normally there should be a public health nurse or a health visitor for four midwives or for 20,000 population, but until such time that more qualified hands are available, one health visitor may be expected to supervise the work of eight midwives. The health visitors will guide and supervise the work of midwives and *dais* and conduct clinics by rotation in centres where midwives are located. At the top of the whole structure there should be medical personnel to render medical care and guide and supervise the work of the rest of the staff. Though it would be desirable to have a woman medical officer at the head of each tahsil or some such administrative division, in view of the non-availability of sufficient number of women doctors it is proposed that two women doctors may be employed at the head of the organisation for a district. They should constantly tour, guide and develop the work. It is also necessary to have at the headquarters of each state, as part

of the Directorate of Health Services, a woman medical officer in-charge of the organisation the whole State.

At centres where midwives and health visitors are located, voluntary effort should be stimulated to provide Maternity and Child Welfare Centres with a certain number of beds—maternity homes. These will serve to hold clinics and to attend to normal deliveries under clean conditions. The doctors of the organisation and others attached to hospitals or in practice should help in giving medical aid.

3. Estimate of cost per centre

The estimate is given in terms of a unit of 5,000 population with a Maternity and Child Welfare Centre. It shows that when a Centre is in full operation a sum of Rs. 2,500 will be required. The estimate of initial non-recurring expenditure is Rs. 700 towards equipment and vehicles. The details for the recurring expenditure are as follows :

Estimate of normal recurring cost

	Per annum
10 <i>dais</i> at the rate of Rs. 50 per annum	Rs. 500
1 midwife at the rate of Rs. 60 per mensem	Rs. 720
Contribution for one public health nurse or health visitor to be incharge of 8 units at the rate of Rs. 125	Rs. 188
Contribution for two doctors to be incharge of 200 units at the rate of Rs. 350 per mensem	Rs. 42
Contingencies (including maintenance of vehicles, etc.)	Rs. 50
Replacement of equipment, etc.	Rs. 100
Travelling allowances	Rs. 100
Rent for building @ Rs. 5 per mensem	Rs. 60
Towards the staff of district headquarters and towards rent for the district headquarters building	Rs. 40
Nutritional supplements	Rs. 200
For Family Planning Services	Rs. 500
TOTAL	Rs. 2,500

Estimate of Non-recurring cost

Towards 2 vehicles to be maintained in district headquarters office	Rs. 200
Towards equipment	Rs. 500
TOTAL	Rs. 700

A bonus of Rs. 50 per *dai* and the pay, etc., of a midwife are provided. Allowance has been made in the estimate for the supervisory staff common to a number of units like the health visitor and the doctors at the district level. It is assumed that normal supervisors at the State level would be available and no special provision is considered necessary. Provision has also been made for replacement of equipment, the proportional expenditure on maintenance of vehicles,

etc. It is considered necessary to provide at least Rs. 200 towards nutritional supplements in addition to local effort. As a subsidy for family planning services a sum of Rs. 500 is provided. It is unlikely that the full expenditure on the complete programme would be required in the early stages, so that sufficient margin of allotment would be available to cover the initial capital expenditure.

PART C

Extracts from the Report of Royal Commission on Population 1949 and Statistical Data.

(i) Report of the Royal Commission on Population.

[Chapter 3.]

[59.] We have a good deal of information about the size of Victorian families, the main source being the Fertility Census of 1911, an inquiry associated with the General Census of that year in which married couples were asked to state their date of marriage and the number of children that had been born to them. From the information so obtained it can be estimated that the average number of children per completed family was in mid-Victorian times between $5\frac{1}{2}$ and 6, and this figure agrees with other calculations based on the numbers of births registered at that time. The Census also threw light on the early stages of the fall in average family size, which by 1911 was well under way. The figures are summarised in TABLE XV.

TABLE XV

Average size of completed family of women born in each Five Year period, 1841-1865, and recorded as married women in 1911 (Fertility Census, England and Wales, 1911).

Period of birth of women	Average number of live births	Reduction in average size of family compared with previous group
1841-45	5.71	...
1846-50	5.63	.08
1851-55	5.40	.23
1856-60	5.08	.32
1861-65	4.66	.42

Over the period covered by this table (most of the births entering into its figures must have occurred during the years from 1865 to 1900) the average size of family fell by a quarter. The fall began slowly and gathered speed as time went on, as the last column of the table shows. The second group of women differed only slightly from the first in average family size; the difference between the last two groups was five times as great. By the end of the period covered by the table the decline was proceeding rapidly.....

[61.] We cannot, unfortunately, continue the series of figures given in TABLE XV, but the Family Census of 1946 provides information about the subsequent trend of family size on a different basis, namely the date at which the marriages took place. The figures are given in TABLE XVI.

TABLE XVI

Estimated average size of completed family of women married 1900-29 (based on Family Census of Great Britain, 1946, provisional figures).

Period of Marriage	Average number of live births
1900-9	3.37
1910-14	2.90
1915-19	2.53
1920-24	2.38
1925-29	2.19

The figures present a picture of rapid decline. Even among the earliest group of married couples, those married in 1900-09, the average number of children born was two less than in mid-Victorian families: a further decline, amounting on average to a reduction of over one child per family, took place between this group and the couples married in 1925-29. The families of this latter group of couples, averaging 2.2 children each, represent a reduction of 60 per cent, on the mid-Victorian average of $5\frac{1}{2}$ to 6.

[62.] These two averages bring out strongly the great extent of the change, but they tell us nothing about the distribution of married couples over different sizes of family. For this purpose we give the figures shown in TABLE XVII, taking the record of the couples married in 1925 as representative of modern habits of "family building".

TABLE XVII

Changes in distribution of families by size.

Number of children born	Marriages taking place about	
	1860 (based on 1911 Fertility Census of England and Wales)	Marriages of 1925 (Great Britain, 1946 Family Census)
	Per cent	Per cent
0	9	17
1	5	25
2	6	25
3]	8	14
4	9	8
5	10	5
6	10	3
7	10	2
8	9	1
9	8	0.6
10	6	0.4
Over 10	10	0.3

[70.] Among couples married in the first three decades of this century, the average size of family of the manual workers has exceeded that of the non-manual workers by a large and consistent margin, amounting to just over 40 per cent. of the average non-manual workers' family. The stability of the difference is striking. Among non-manual workers married since 1920 the average number of children born per married couple has fallen well below two, while the manual workers have come down to an average of about $2\frac{1}{2}$ each.

TABLE XXI

Estimated average size of completed family, manual and non-manual workers, according to period of marriage (based on Family Census of Great Britain, 1946 provisional figures).

Date of Marriage	Non-Manual Workers	Manual Workers	Ratio of (3) to (2) (percentage)
1900-09	2.79	3.94	141
1910-14	2.34	3.35	143
1915-19	2.05	2.91	142
1920-24	1.89	2.73	144
1925-29	1.73	2.49	144

[72.] There is some evidence—though the statistical information on the subject is scanty—that the trend of family size has differed between people of different religious affiliation. The decline has been slower among Roman Catholics than among Protestants. But the extent of the difference can easily be overstated; there is little doubt that average family size has declined greatly even among the Roman Catholics. Moreover, Roman Catholics of different occupational groups seem to differ in average family size in very much the same way as do non-Catholics.

[Chapter 4]

[74.] The fall in the size of the family over the last seventy years, which was described in the previous chapter, is the salient fact in the

modern history of population in Great Britain. In examining its causes we have first to distinguish between two distinct kinds of influence, and to measure, so far as possible, the importance of each. These are, on the one hand, the extension of deliberate family limitation, and on the other any changes which may have taken place in what we may conveniently call "reproductive capacity"¹; in brief, the distinction between voluntary and involuntary factors. In this task we have been greatly aided by the work of the Biological and Medical Committee, and this Chapter is little more than a summary and paraphrase of their report on Reproductive Capacity².....

Conclusion :

[87.] There is thus an overwhelming volume of evidence in this and other countries that the rates of childbearing are at present being greatly restricted by the practice of birth control and other methods of deliberate family limitation below the level at which they would stand if no such methods were practised. That this level is itself as high as it was before 1880 cannot be stated dogmatically. It is just possible that there has been some decline in reproductive capacity, though there is no positive evidence to this effect; indeed, so far as we know, reproductive capacity may well have risen. If there has been any decline, it is extremely unlikely that it has been sufficient to account for more than a small part of the fall in average family size. Of this fall, the spread of deliberate family limitation has certainly been the main cause, and very probably the only cause. Finally, there can be no doubt that if the married couples of today wished to have much larger families than they now have, they would be able to do so; no biological or physiological factor would prevent them.....

[Chapter 8]

[192.] It is true that *coitus interruptus* is very widely practised and the available evidence does suggest that it is somewhat less effective as a

¹ We include under "reproductive capacity" all the conditions contributing to the number of children born to a group of married couples among whom deliberate family limitation is not practised. It is thus affected by changes in the opportunity and desire for sexual intercourse, and by the rate of "reproductive wastage" from spontaneous abortion and stillbirth, as well as by the physiological factors which determine the case with which conception is brought about.

² Papers of the Royal Commission on Population.

method of contraception than "appliance" methods. On both these points the Fertility Inquiry of the Royal College of Obstetricians and Gynaecologists gives definite evidence. Thus among a group of couples married in 1935-39, all of whom had practised some form of birth control between marriage and 1946, as many as 44 per cent. had never employed any kind of appliance contraceptive; and pregnancy rates during the practice of "non-appliance" birth control were found to be about one-fifth higher than under appliance methods. In discussion about the future of the birth rate it has often been taken for granted that the practice of non-appliance methods reflects an ignorance of the existence of more effective methods or a prejudice against them of a kind which can be expected to be fairly rapidly dissipated with rising standards of education, the spread of knowledge and the normal processes of social imitation. It is easy to push this line of thought too far. Among the young married couples of today, or at least among the male partners, ignorance of the existence of "appliance" methods of birth control is now rare. A dislike of these methods is by no means always founded on mere prejudice; many couples try them and give them up. Thus in follow-up work at a New York birth control clinic it was found that over a period of 18 months from receiving advice at the clinic, more than half of the couples advised had abandoned the clinic contraceptives, and in many cases had returned to *coitus interruptus*³. It must not be assumed that in the present state of birth control technique there may not be a considerable number of people who positively prefer non-appliance methods. Nor must it be assumed that non-appliance methods, even though they may be less efficient in reducing the rate of conception per unit of time, are necessarily less effective in the final limitation of the family. The evidence provided by the Fertility Inquiry of the Royal College of Obstetricians and Gynaecologists, so far as it goes, does not suggest that couples who practise non-appliance methods have larger families than those who use appliance contraceptives, nor that a larger proportion of them have unwanted children.

[193.] Finally, even where *coitus interruptus* is so practised as to yield a large number of more or less unwanted children, the result may

³ STIX and NOTESTEIN, *Controlled Fertility*, 1940

well be due less to inherent inefficiency than to the lesser degree of care with which it is practised. Human failings, such as irresponsibility, carelessness or even drunkenness may be the causes of the unsuccessful practice of *coitus interruptus*; and these are caused which also make the practice of other birth control methods unsuccessful. Nor are they automatically eliminated by rising standards of education, social imitation and so on. During the interwar period knowledge about birth control was spreading rapidly. The proportions of married couples who employed "appliance" methods was rising continuously; the evidence of the Fertility Inquiry of the Royal College of Obstetricians and Gynaecologists leaves no doubt on this point. On the other hand it gives no support to the belief that the proportion of unwanted births was thereby reduced.

(ii) **Papers of the Royal Commission on population Volume I—Family Limitation and its influence on human fertility during the past fifty years.**

.....The argument in favour of such an investigation was expressed by the Biological and Medical Committee of the Commission as follows :

" It is essential that we should be able to give authoritative answers to certain questions bearing on what may be called the mechanics of family limitation. The chief of these questions are the following :

- (1) How extensively is birth control practised ?
- (2) In what proportions are the different methods of birth control practised ?
- (3) Are there important differences between different social groups in the extent of the practice of birth control, or in the choice of method ?
- (4) To what extent is birth control, as practised, effective ?
- (5) What is the extent of involuntary infertility ?
- (6) Does the practice of birth control affect to the power to reproduce ?
- (7) How important is abortion as a method of birth prevention ?
- (8) What is the proportion of 'unplanned' pregnancies ?
- (9) What is the proportion of 'unwanted' children ?
- (10) What are the chief reasons given for using birth control ?

At present no data exist which would enable trustworthy answers to be given to these questions.....

How extensively is birth control practised ?

The percentage of women reporting the use of any form of birth control, classified according to date of marriage, is shown in TABLE 2.

TABLE 2
Percentage of women using birth control at some time during married life.

Date of marriage	No. of women	Percentage who used birth control
Before 1910	161	15
1910-19	361	40
1920-24	342	58
1925-29	339	61
1930-34	440	63
1935-39	617	66
1940-47	974	55
Omitted	47	...
TOTAL	3,281	

This table shows that there is a steady increase with date of marriage in the use of birth control at some time during married life. It should be noted that these percentages underestimate the percentage of women who will eventually use birth control in the later marriage cohorts*, since some of those not using it up to the time of the survey will subsequently adopt it. This accounts for the lower percentage in the last cohort.....

In what proportions are the different methods of birth control practised ?

The main contrast in method is between appliance and non-appliance methods. Non-appliance methods were taken to include *Coitus Interruptus* (C. I.) abstinence and "safe period's

*Throughout this Report, the term "marriage cohort" is used to indicate groups of women married in a given set of years.

What is the extent of involuntary infertility ?

TABLE 14

Women married before 1925. Percentage with 0, 1, 2, or more children.

	No. of children				No. of women
	0	1	2	3+	
(a) Control never used	12.4	12.6	15.6	59.4	470
(b) Control used.	3.0	16.3	28.7	52.0	368
All women	8.2	14.2	21.4	56.2	838
(a) as percentage of all women (838)	6.9	7.1	8.7	..	..

As a first approximation we may take it that the childless women in the group of control users would have had one or more children if they had not used control. The percentage of completely non-fecund women will therefore lie between 6.9 per cent. and 8.2 per cent.—the percentage of women without children in the whole sample. This is no greater than the percentage, 8 per cent. of childless women in marriages occurring around 1860.....

What is the proportion of 'unplanned' pregnancies ?

About 23 per cent. of all pregnancies of women who used control at some time during their married lives occurred as a result of failure of control. The proportions of unplanned pregnancies showed no relation to social class.....

What is the proportion of 'unwanted' children ?

The percentage of children that were stated to be unwanted increased from 6 per cent. in marriages before 1910 to 14 per cent. in marriages during 1930-34..... The percentage of unwanted children in families using control remained fairly constant up to 1934 with values ranging from 15 to 18 per cent.

Not more than 5 per cent. of first-born children to birth controllers were unwanted by any marriage cohort since 1910. But for second, third,

fourth and higher orders the proportion unwanted has increased with time to about 15, 30 and 50 per cent respectively. Of birth controllers who had unwanted children, about 60 per cent. of their second children and 80 or more per cent. of their third and later children were unwanted. Throughout the century, third and fourth children have been regarded as unwanted by the more well-to-do women in the sample more frequently than by the rest of the women

There is no evidence that the appliance users were more successful in designing the size of their family than were those who relied on non-appliance methods. We find that 2.6 children were desired by women married in 1920-24, and 1.7 children by those married in 1930-34. There is some evidence, however, that women who did not adopt control desired slightly larger families than those who did.....

What are the chief reasons given for using birth control ?

In the earlier marriage cohorts the main reasons in order of importance are : (a) that more children could not be afforded, (b) to space pregnancies, (c) for health reasons, and (d) that parental instincts were satisfied with the children already born. Housing difficulties and uncertainty due to the war ranked high in the later marriages. No less than 32 per cent. of those using control and married between 1940 and 1946 gave housing difficulties as one of the reasons for using control.

Financial considerations are advanced as a reason for using control rather more frequently by Social Class III, while uncertainty due to the war is advanced more frequently by Social Class I. Otherwise there is little difference between the different social classes.....

Summary

In the foregoing section incontestable evidence of continuous expansion in the use of birth control methods in the present century has been displayed. But this expansion has to a great extent arisen from a continuous extension in the use of appliance methods of contraception. The use of non-appliance methods reached a peak in 1920-24 since when it has steadily declined. The relative prevalence of these two main types of method varies in the three social classes at

different points of time. The rate of growth of birth control and of appliance methods, and the rate of decline in non-appliance methods also vary in the social classes and are influenced by the relative levels of each in the early years of the century. The total amount of increase in contraception in class I is less than in the other classes, but started at a higher level. An evening-up process in the knowledge and practice of birth control methods appears to have reached a culmination amongst women married in the nineteen thirties. The true measure of such effectiveness would be the difference

between the average number of children actually born to a group of controllers and the number they would have had if they had not used birth control. Such an index certainly cannot be obtained from the data of this enquiry.

It can be stated then that the effect of using birth control was to lower the average number of births per woman by not less than one child, and that this result was mainly contributed to by a smaller proportion of families of more than five children amongst those who had at some time adopted control.....