

## Change in the Work Force in British India, 1881-1921

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### Introduction

The period from the late nineteenth century to the early twentieth century witnessed a significant socio-economic transformation in India. With development of railway and irrigation, and export growth, commercialization of agriculture took place extensively. There would have been a change in life style of those who gained from the commercialization. Thus demand for goods and services traditionally produced and supplied by village artisans and service castes gradually changed. In the non-farm sector, on the other hand, the so-called labor intensive industrialization started taking place after the process of de-industrialization from the late eighteenth century to the mid nineteenth century. Expansion of railway network brought remote areas to economic integration with urban areas. Facing the competition with imported goods and products of urban sectors the traditional *jajmani* system was gradually undermined.

The purpose of this paper is to examine the census occupation data of British India and to look into changes in occupational structure of work force during the period. It is well known that the census statistics on occupation, female occupation in particular are problematic and scholars such as the Thorners (1962) doubted its reliability. Roy (2005), however, recently suggested to use female occupation data. The paper tries to scrutinizing the work force data in British Territories of Madras Presidency and Punjab Provinces at district level from 1881 to 1921. When occupational structure changes, it is assumed that different patterns would be observed under different socio-economic settings. Female work participation, for example, differs markedly between North and South India. It is thus expected that the change could be seen more clearly through a comparison between Madras and Punjab. Regrettably, the 1891 census reported only population (actual workers and dependents altogether) supported by occupation groups in the occupation tables, so that separate figures of workers and dependent were not available. We, therefore, use only four censuses, i.e., 1881, 1901, 1911 and 1921.

The following section briefly introduces the population census instructions and classification schemes of occupations. Section two attempts a reliability test for female worker population ratios. The section also examines problems related to classification of occupations. In the

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section three we discuss on several aspects of changes in occupational structure of workforce, such as variations in distribution of workers by industry, a decline in worker population ratios of cultivators, and changes in agricultural laborers and workers in hereditary occupations of village artisan and service castes. The last section summarizes the paper.

## 1. Enumeration of Workers in Population Census

Census of India collected and information on occupations of both males and females since 1881. Since the definition and method of enumeration often changed, it is of importance to review the schedules and instructions briefly.

The census schedule for occupation in 1881 was "Occupation of men; also boys and females who may do work." Since 1901 the schedule was almost same and recorded "principal and subsidiary occupations of actual workers and for dependents, the principal occupation or means of subsistence of actual worker on whom dependent". The definition of actual worker was "those who actually do work or carry on business whether personally or by means of servants, or who live on house-rent, pension, etc." Thus, the actual workers in the population census in British period include not only persons in gainful employment but also non-workers, like those living on rents or pensions and unproductive workers. For working out figures of workers, therefore, non-workers have to be deducted.

Instructions regarding female workers are as follows<sup>1</sup>;

1881

Only such persons are to be shown in this column as actually do work contributing to the family income. 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.

1901

Women and children who work at any occupation, of whatever kind not being an amusement or of a purely domestic character, such as cooking, must be entered in this column, whether they earn wages or not.

1911 and 1921

Women and children who work at any occupation which helps to augment the family income must be entered in Column 9 under that occupation and not in Column 11.

The instructions to the superior census staff is as follows;

Only those women and children will be shown as workers who help to augment the family income. A woman who looks after her house and cooks the food is not a worker but a dependant. But a woman who collects and sells firewood or cow-dung is thereby adding to the family income, and should be shown as a worker. So also a woman who regularly assists her husband in his work, e.g., the wife of a potter who fetches the clay from which he makes his pots, but not one who merely renders a little occasional help.

According to the instructions mentioned above, the definition of workers in 1881 census was

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<sup>1</sup> Instructions pertaining to economic questions issued at each census from 1872 to 1961 are compiled in Appendix IV of Census of India 1961 Vol.1 India, Part II-B(i), General Economic Tables.

much narrower. Thus production for home consumption was outside the boundary of work. In fact, it was reported in 1891 census that “the phrase ‘regularly brought to market’ (in 1881 census instruction) is said to have excluded a good number of the class to whom it was intended to apply.” In this respect the definition in 1901 was wider because it was based on work criterion. Since 1911 income criterion was applied but regular unpaid family helpers were also included in actual workers.

Since 1901 both principal and subsidiary occupations were recorded, and the major time criterion was applied in 1901 whereas the major income criterion was applied in 1911 and 1921 for classification of principal and subsidiary occupations.

The classification scheme of occupations applied in each census was given in **Table-1**. We will discuss on problems related to classification in the next section.

## 2. Reliability of the Occupation Data

### (1) Reliability Test of Female Worker-Population Ratios

Changes in the definition of workers and instructions given to enumerators influence on enumeration of workers and make an inter-census comparison difficult. According to Visaria (1995),

An analysis of the changes in the share of non-farm employment in the rural economy must necessary begin with a review of the worker-population ratios (WPRs) because changes in the latter can offset some of the sectoral shifts in the distribution of workers. When the WPRs are not quite comparable, the underlying industrial distribution of workers cannot be presumed to reflect the reality because the excluded workers are not necessarily distributed at random over different industrial divisions or groups<sup>2</sup>.

Thus the level of WPR could be an index for reliability of work force data. Excluding non-workers from the census occupation data, the WPRs for Madras and Punjab are calculated and are shown in **Table-2**. The male WPR in Madras was about 62 percent in 1881 and 1901, and declined slowly to 57.3 percent in 1921. In Punjab it was considerably low in 1881, 54.7 percent<sup>3</sup>, and rose to 58.1 percent in 1911 and declined to 54 percent in 1921. There is a marked contrast in the female WPRs between Madras and Punjab. The female WPR in Madras was much higher than that of Punjab. As well known, the difference in female work participation between North and South is due partly to the deep-rooted *pardah* system which still remains in present-day India. The female WPR in Madras showed a similar trend with that of males, with the peak in 1901. The female WPR in Punjab, on the other hand, was considerably high in 1881 and declined steadily to 7.1 percent in 1921. It is thus noticed that the WPR was higher in earlier censuses than the later years with which the Thorners considered data on female workers as unreliable.

Are the female WPRs in earlier censuses really higher to the extent that inter-census comparison would not be possible? Let us compare these figures with the WPRs in 1961 census

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<sup>2</sup> Visaria (1995) p.399.

<sup>3</sup> It is reported that children under 15 of age were not tabulated in Provincial Tables of Punjab in 1881. See Census of India 1881, Punjab Vol.1 p.378.

which are supposed to be good at enumeration of female workers<sup>4</sup>. The WPRs in Madras in 1881 and 1901 are at almost the same level of Andhra Pradesh (62.2 percent for male and 41.3 percent for female), but they are much higher than Tamil Nadu (59.7 percent and 31.3 percent), Mysore (58.4 percent and 32.0 percent) and Kerala (47.2 percent and 19.7 percent). The male WPRs in Punjab in 1901 and 1911 are much higher than that of Indian Punjab in 1961 (52.9 percent) while the female WPR in 1881 is higher than 1961 (14.2 percent) by 1.1 percent. However, when taking changes during the six decades in age distribution of population, school attendance, urbanization and other factors into consideration, it is unlikely that the WPRs of earlier censuses, female WPRs in particular, is abnormally higher.

Let us try an exercise, a reliability test for female WPRs during the period. If a change in the definition and methodology of census operation in a particular year caused a serious over-enumeration or under-enumeration, a year specific upward or downward bias could be observed after controlling the impacts of socio-economic factors on the female work participation. In other words, when the female WPR is regressed to promising explanatory variables and still the year specific bias remains, then we would be able to judge as over- or under-enumeration in the year.

Let us try a regression analysis to explain inter-district and inter-temporal variations of female WPRs. We take two dependent variables, one, the female WPR and the other, the ratio of female WPR to male WPR. The former is directly measuring women's work participation and the latter is measuring the extent of over- or under- enumeration of female workers in relative terms, with the assumption that the enumeration of male workers was comparatively reliable.

A crude worker-population ratio varies depending on demographic factors, such as age distribution of population, and socio-economic factors like school attendance, urbanization, social status of women, and living standard and so on. For explanatory variables, we take population pressure, age distribution of population, proportion of Muslim population, urbanization, some indicators of agricultural development, such as irrigation ratio, cropping intensity, proportion of area under rice/wheat and commercial crops, and some region dummies. In addition we incorporate year dummy variables to measure a year specific bias. If any coefficient of year dummy is positive (negative) and statistically significant, then it suggests that the WPR of the year is supposedly over- (under-) enumerated either due to errors in enumeration or due to important variables omitted. If the coefficient of year dummy is not statistically significant, it is likely that there was no over- or under-enumeration in the year.

The model for an OLS regression of female WPR (and female WPR / male WPR) is as follows;

$$(1) Y = \alpha_0 + \sum \alpha_i * X_i + \sum \beta_j * D_j + \gamma_1 * Yd01 + \gamma_2 * Yd21 + \epsilon$$

where, Y is the dependent variable, X<sub>i</sub>s are the explanatory variables, D<sub>j</sub>s are district dummies (Deccan districts and west coast districts for Madras, Hill district for Punjab), Yd01 and Yd21 are year dummies for 1901 and 1921, respectively.

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<sup>4</sup> Census of India 1961, Paper No.1 of 1967, Subsidiary Table B-I 6.

Considering data availability, we have to exclude 1881. This is indeed a serious drawback for this exercise. Yet we can judge if female work participation was over-enumerated in 1901. Thus district data pooled for three years are used and regression was run separately for Madras and Punjab.

The results of regression analysis are given in **Table-3**. The coefficients of determinant for Madras are not high as that of Punjab, though F-values of all models are statistically significant at 1 percent level. As for the direct measuring female WPR in Madras, the coefficients of Muslim population ratio, rice area ratio, non-foodgrain area ratio, and the number of sheep per person are all negative and statistically significant. The coefficient of Yd01 is positive (0.0037) but not significant statistically, but that of Yd21 is negative (-0.574) and statistically significant. For Punjab the coefficients of proportion of non-labor force, wheat area ratio and the number of ploughs per person are all negative and statistically significant. The coefficient of population pressure is positive and statistically significant at 10 percent level. The signs of coefficients of Yd01 and Yd21 are negative but both are not statistically significant. Regression results for measuring the ratio of female WPR to male WPR are similar to the direct measurement of female WPR.

From the regression analysis mentioned above, it is likely that the variation of female WPR was within the range that could be explained by socio-economic factors and that of 1901 was not over-enumerated. As for the female WPR of Madras in 1921, the coefficients of determinant adjusted are low, suggesting unexplained fluctuations. It is most probable that the negative coefficient of Yd21 is due to omitted variables, rather than due to under-enumeration.

## **(2) Problems Related to Classification of Occupations**

It is very important to differentiate changes which actually took place from the spurious fluctuations in distribution of workers by occupation due to classification errors. If any classification error is detected, adjustment is required accordingly. This is, however, not an easy task. There are supposedly three problems related to classification of occupations, namely (a) how to record the occupation of workers with dual or multi-occupations, (b) frequent change in the system of classification of occupations, and (c) the so called 'general labor' or 'workers otherwise unspecified'.

### **(a) multi-occupations**

It was a common feature of rural India that a person was engaged in several activities.

To quote the report of the census of Punjab 1881:

We have not here in the Panjab, and least of all in the villages of the Panjab, a differentiation of occupations such as exists in England, where each definite craft or minute branch of labour is confined to a specific class of workmen who follow that craft exclusively. (.....) I have shown in discussing the menial and artisan castes how impossible it is to draw any definite lines between the numerous castes whose very basis is the hereditary occupation they follow, and the same vagueness and uncertainty extends to the calling of the individuals composing those castes. (.....) They think that the name of the caste to which a menial or artisan belongs is a quite sufficiently accurate and

comprehensive definition of his occupation<sup>5</sup>.

It is likely that the concept of occupation in rural India was different from that of common in England. Rather it was a work of a particular caste to perform a set of activities, required for agricultural production and for daily life in a community. A Chamar (leather worker), for example, performed as an agricultural laborer in a busy season in addition to his hereditary leather work. A Chuhra (sweeper) was expected not only to clean cowshed and make cow-dung but also to participate in agricultural labor. These two occupations, leather work and agricultural labor, or sweeping and agricultural labor, are a set and are inseparable. These are supposedly a Chamar's work and Chuhra's work.

The problem of 'maker and seller' is another example. A Kumhar (potter) was supposed to make earthen pots for Persian wheel and a Tarkhan (carpenter) was supposed to make and repair a plough but their work was not for sale. They received customary dues from farmers, a share of products per well or per plough and other various forms of allowances.

There are two problems with this. One problem is that the classification error might have slipped in. The other is that whole structure of occupation of a person or a caste could not be captured. It is natural that applying Farr's classification system of occupations without any adjustment caused significant confusions while enumerating and classifying the occupation. At enumeration, it is supposed, the name of caste or at most the hereditary occupation of the caste was recorded and accordingly the person's occupation was classified.

Two occupations, principal and subsidiary, were recorded to solve the problem. In 1881 it was only for workers in agriculture that a subsidiary occupation was to be recorded, though it was reported that recording of secondary occupation was insufficient. For workers in non-agricultural occupations, however, only the principal one was to be recorded. An order or sub-order of 'complex occupation' was considered in 1891 census but it was not materialized. Both principal and subsidiary occupations were started being recorded from 1901, with the major time criterion in 1901 and with the major income criterion in 1911 and 1921. It is not an easy task for enumerators to confirm the principal and subsidiary occupations and it is supposed common that the caste name or hereditary caste occupation was simply recorded. Here is a possibility that a classification error comes in.

Agricultural laborers in Madras in 1901 accounted for 18.7 percent and 35.1 percent of total workers for male and female, respectively, while sweepers' share was less than 0.1 percent. In Punjab, on the other hand, agricultural laborers' share was 2.5 percent and 2.1 percent for male and female, respectively, while that of sweepers was as high as 3.4 percent and 11.0 percent respectively. It is not certain if sweepers (and leather workers also) were properly classified according to major time criterion in Punjab.

### **(b) Change in the Classification of Occupations**

The English system of classification was adopted in 1881. It was 6 classes, 18 sub-classes,

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<sup>5</sup> Census of India 1881, Punjab, Vol.1, p.376.

and 78 orders as shown in Table. The number of groups could be adjusted according to local conditions, thus it was 480 in Madras and 334, in Punjab. One of the major problems of 1881 classification system is that grouping was not appropriate for Indian conditions. Thus there was no differentiation between rent receivers and cultivating owners, between farm servants and field laborers, nor further grouping of cotton textile workers, to mention a few. The classification scheme of Bertillon was applied in 1901 with some modifications. This was the most comprehensive classification, with 8 classes, 24 orders, 79 sub-orders and 520 groups (plus some sub-groups), and grouping was adjusted to Indian condition.

The Classification system was considerably changed in 1911 and the number of groups was reduced to 169 from 520 groups and 39 sub-groups in 1901. Thus all occupations were divided into 4 classes, 12 sub-classes, 55 orders and 169 groups. Groups of 'maker and seller' were classified under 'industry'. Unfortunately, spinning and weaving, and farm servants and field laborers were put together, respectively. Again in 1921 some groups were sub-divided and the number of groups was expanded to 191. The group of 'cotton spinning, sizing and weaving' in 1911, for example, was sub-divided into 'cotton spinning' and 'cotton sizing and weaving' in 1921, and the group of 'agricultural laborers' in 1911 was subdivided into 'farm servants' and 'field laborers' in 1921. When it comes to a comparison at group level between censuses, we have to re-classify groups of other censuses according to the system of 1911 census.

### **(c) Size of 'General Laborers' or Unspecified Workers**

There were 477.8 thousand and 698.5 thousand general laborers for males and females, respectively in Madras in 1881. This was a significant number, accounting for 3.5 percent and 4.9 percent of total workers. In Punjab the number of general laborers was comparatively small, 226 thousand and 43.1 thousand, for males and females, respectively. In Madras the number of persons of this category decreased to 315 thousand in 1901 but again increased to one million in 1921. It was reported that this was mainly due to the fact that general and imprecise terms, like 'labor' and 'coolie', were used, though the instruction was repeatedly given for not to use vague terms. There are several opinions on how to handle the general laborers. The Thorners (1962) and Patel (1950) added general laborers to agricultural laborers and Krishnamurthy (1972) distributed them into agricultural, construction, and service laborers. Roy (2005) considered general laborers as a measure of occupational coalescence.

Let us examine correlations between agricultural laborers and general laborers. Since there were often changes in district border it is not possible to calculate actual numbers of increase or decrease for each district. After adjusting for bifurcation or a creation of new districts, inter-census differentials in the proportion of agricultural laborers and general laborers to total workers are calculated. For example, the proportion of male agricultural laborers in Ganjam district in 1881 was 10.9 percent and it was 16.5 percent in 1901, with the percentage point change being 5.6 percent. The correlation coefficients between percentage point changes of agricultural laborers and general laborers are shown in **Table-4**. Since there were district border changes, the coefficient of correlation was not high. Nevertheless it is evident that there was an inverse

relationship between changes in the proportion of agricultural laborers and general laborers in Madras. This fact suggests that increase in agricultural laborer and decrease in general laborers were closely inter-related. Regrettably, it is not possible to say that this was due to classification errors or to actual change in employment without further evidence.

Interestingly there is no negative correlation between the two variables in Punjab. This is due partly to a fact that Chamar and Chuhra supplied agricultural labor in Punjab, and they might have returned their caste name or hereditary occupation as their principal occupation. We will return to this topic later when we examine agricultural labor.

### 3. Change in the Work Force, 1881-1921

As mentioned above agricultural development took place during the period. Area irrigated increased from 6.3 million acres in 1890-91 to 9.4 million acres in 1920-21 in Madras, and in Punjab, it increased from 7.5 million acres to 13 million acres during the same period. Development of canal colonies in Punjab is well known. Area under crops increased rapidly and agricultural production increased at 1.8 percent per year in Madras and at 1.9 percent per year in Punjab. Growth of commercial crop production was much faster (annual growth rate was 3.0 and 2.7 percents for Madras and Punjab, respectively) than foodgrain production (1.5 and 2.7 percents), as shown in **Figure-1**. Development was also seen in the number of cattle and buffalos, sheep and goats, and the number of ploughs and carts. Let us examine what sort of change took place in work participation and in occupational structure under the agricultural development during the period.

#### (1) Distribution of Workers by Industry

**Table-5** indicates the change in distribution of workers by industry in Madras and Punjab from 1881 to 1921. It is convenient to divide the period into two, from 1881 to 1901 and from 1901 to 1920. Note that during the first period the WPRs rose or remained at the higher level, whereas it gradually declined during the second period.

The following points are noticed:

- 1) The share of agricultural sector was higher in Madras while that of non-agricultural sector was much higher in Punjab and this is mainly due to a big difference in the proportion of agricultural laborers between the two Provinces.
- 2) For males, the proportion of cultivators in total workers rapidly rose from 38.9 percent in 1881 to 49.2 percent in 1901 in Madras, while it slightly increased from 50.0 percent to 51.9 percent in Punjab<sup>6</sup>. After the turn of the century cultivators' share remained stable in Madras and declined slowly in Punjab. The proportion of agricultural laborers increased gradually in Madras and Punjab. The proportion of workers in manufacturing declined gradually in Madras, while it showed a marked fall from 23.3 percent in 1881 to 16.6 percent 1911 in Punjab. The share of

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<sup>6</sup> The smaller proportion of ultivators in 1881 in Madras is partly due to re-classification error as rent receivers and cultivating landowners were not properly classified. See Census of India 1881, Punjab, Vol.1, p.381 and Madras, Vol.1, p.150.

non-agriculture (secondary and tertiary sectors) as a whole declined gradually. There was a rapid fall of percentage of general laborers in Madras and Punjab between 1881 and 1901.

3) For females, the share of cultivators increased rapidly, from 24.7 percent in 1881 to 42.5 percent in 1901 in Madras while it decreased from 37.3 percent to 32.8 percent in Punjab. The percentage of agricultural laborers in Madras rose slightly till 1901 and then gradually decline. The proportion of workers in manufacturing fell rapidly during 1881 and 1901 in both Madras and Punjab. The share of workers in non-agriculture as a whole fell in Madras but it rose in Punjab. The percentage of general laborers fell in Madras but it rose in Punjab between 1881 and 1901.

It is noticed that the pattern of variation in the distribution of workers during the late nineteenth century was different between Madras and Punjab. In Madras the proportion of male and female workers in manufacturing industry declined and that of cultivators rose. In Punjab, on the other hand the percentage of industrial worker declined but the share of cultivators did not increase. Rather, the share of female cultivators declined.

What happened to female workers in manufacturing industry? When we see a change in female workers in cotton textile industry, it decreased from 457 thousand in 1881 to 236 thousand in 1901 in Madras, while it decreased from 252 thousand to 117 thousand in Punjab, as shown in **Table-6**. Since the classification scheme changed the strict comparison is not possible but as a majority of female workers were engaged in spinning in Punjab and male workers were mainly in weaving, it is most likely this decrease in female workers was taken place in cotton spinning. With a change in preference for softer and refined cloth and a competition with imports and urban products female workers gave up hand spinning. Since production activity for home consumption was not regarded as work in the census, those women who were engaged in hand spinning for home consumption were not enumerated as workers. It is, therefore, likely that hand spinning had been common among women of farm households who could afford a *charka* and they also gave up spinning. Note that those women were regarded as spinners in 1881 because they could earn wages. By 1901 they gave up spinning and did work as family helper on own farm as before, and they were regarded as cultivators because the work criterion was applied in 1901 census. This is one of the factors behind the large swelling of female cultivators in Madras.

In Punjab, on the other hand, women usually did not work outside their home so that giving up spinning resulted in a decline in work participation. This is one of the reasons for a fall of female WPR from 15.3 percent in 1881 to 10.4 percent in 1901.

Thus 'de-industrialization' took place during the late nineteenth century, though it is not certain if the term is appropriate in this case. When taking hand spinning for home consumption by women into account, the actual change in occupational structure would have been more drastic than as seen in the census data. Female workers left spinning and returned to cultivation in Madras, and they exited from work participation in Punjab.

Now let us turn to the change in the second period. The pattern of change was rather similar for Madras and Punjab. The proportion of male cultivators remained unchanged or declined gradually, while that of female cultivators declined. The share of industrial worker also declined gradually, though the share of non-agriculture as a whole remained unchanged, except female

workers in Punjab. The change in the distribution of workers by industry seems to be rather gradual but significant changes were taking place behind the scene. First, rent receivers increased and second, cultivators' work participation declined, both of which led to a decline in the worker-population ratios as a whole.

## (2) Decline in Work Participation among Land holders and Cultivators

Since a rent receiver is not a worker, we take a proportion of persons whose means of livelihood was rent (rent receivers and their dependents) to total agricultural population (landholders and cultivators and their dependents). The proportion in Madras increased from 4.5 percent in 1901 to 5.5 percent, and further to 12.2% in 1921, as shown in **Table-7**. Similarly it went up from 3.9 percent to 8.2 percent in Punjab. The proportion of male tenant cultivators to total workers, on the other hand, increased from 12.0 percent to 17.3 percent in Madras. It swelled from 9.5 percent to 16.8 percent for females.

An OLS regression of the variation of percentage of rent receivers defined above on some indicators of agricultural development is tried with the following model;

$$(2) Y = \alpha_0 + \sum \alpha_i * X_i + \epsilon$$

where , Y is a dependent variable, proportion of rent receivers in landholders and cultivators, and  $X_i$ s are explanatory variables.

It is interesting to note that in Madras the model's fitting is not good (F value = 0.85) and none of the coefficients of explanatory variables such as irrigation ratio, share of rice and non-foodgrain crops are not statistically significant. This suggests that the distribution of rent receivers and its variation over time in Madras were not correlated with agricultural development of the district. Rent receivers migrated to urban areas like Madras and Madura cities.

In Punjab, on the other hand, the regression result shows that coefficients of share of wheat and non-foodgrain crops are positive and statistically significant, suggesting the distribution of non-cultivating land owners was correlated with agricultural commercialization in the district though the coefficient of determinant is not high (0.23), as shown in **Table-8**.

Next is a decline in WPR of cultivators. The occupation tables of 1901, 1911 and 1921 censuses provide the number of actual workers by sex, dependents and total number of actual workers and dependents which enable us to calculate the worker-population ratios by occupational groups not separately for male and female, but together. Let us call this as a group specific worker population ratio (GSWPR). **Table-9** indicates the GSWPRs for Madras and Punjab.

The GSWPR of cultivating household in Madras declined significantly from 51.9 percent in 1901 to 48.1 percent in 1911 and to 45.8% in 1921. It fell from 34.9 percent to 32.1percent in Punjab. There was a slight difference between owner cultivators and tenant cultivators, as seen in the table. Since male workers were in majority and change in their work participation was likely small, it is supposed that female work participation declined largely.

The GSWPR of cultivators' group is regressed on various indicators of agricultural

development with the following model.

$$(3) \quad Y = \alpha_0 + \sum \alpha_i * X_i + \beta_1 * D_1 + \beta_2 * D_2 + \epsilon$$

where, Y is dependent variable, GSWPR of cultivators group, X<sub>i</sub>s are explanatory variables, D<sub>1</sub> and D<sub>2</sub> are district dummies for Deccan and West Coast in Madras.

The result is given in **Table-10**. For Madras, the coefficients of irrigation ratio, population pressure, and share of non-foodgrain crops are negative and statistically significant. For Punjab the coefficients of share of wheat, non-foodgrain crops, and proportion of children are negative and statistically significant, while that of cropping intensity and the number of cattle and buffaloes per person are positive and significant.

Though there are some differences between Madras and Punjab, the result suggests that area under commercial crops including rice in Madras and wheat in Punjab had negative effect on work participation of cultivating households. It is likely that in addition to demographic factors agricultural prosperity with commercialization led to a decline in work participation among cultivators.

### (3) Agricultural Laborers

In 1881 agricultural laborers in Madras accounted for 17.3 percent and 34.2 percent of total workers for males and females respectively in 1881. Not only the shares, the number of female agricultural laborers was much numerous than males, 2.18 million against 1.66 million. Thus agricultural labor was one of the most important female occupations in Madras. The number of agricultural laborers increased rapidly during the first period and reached 2.19 million for male and 2.84 million for females. The peak was somewhere between 1901 and 1911, and the number started a decline since then. Note that there was a fall in general laborers during the first period, and if we put agricultural and general laborers together, the total number of laborers remained unchanged for both males and females during the period. Industrial workers decreased, as mentioned above, and hence de-industrialization in fact took place during the late nineteenth century. It is, however, not agricultural and general laborers, but cultivators that the number of workers swelled.

Regarding agricultural laborers in Punjab, it is really difficult to measure the variation during the period, as those classified to leather workers and sweepers supplied agricultural labor as well. It was reported in 1881 census report of Punjab that

The water-carriers, leather-workers, and scavengers occupy in the east and centre of the Panjab a very important position in the agricultural community, much of the hardest field-work being performed by them. (.....) We find that the leather-workers, with whom I have included shoe-makers, are most numerous in the Jamna tracts and the hills, where they are recognized field labourers and supply a considerable portion of the agricultural labour employed. In the centre of the Province their place is taken by the scavengers who there

occupy a precisely similar position<sup>7</sup>.

Chuhra's or Mussali's main work in a village community was supposedly cleaning cowshed of cultivators, and they returned their caste name or the hereditary occupation as their principal occupation. That is why they were classified as sweepers even if they were engaged in agricultural labor. It is, therefore, probable that analysis of secondary occupation of these castes is required, but unfortunately the data is not sufficiently available.

What happened to the mode of agricultural labor? The separate figure is available for farm servants and field laborers in 1901 and 1921. The distribution of agricultural laborers by the mode is given in **Table-11**. It is clear that the share of female farm servants had a minor share in Madras and Punjab in 1901. The number of female farm servants in Madras, however, increased by nearly 300 percent and its share rose to 27 percent among female agricultural laborers and their share in total farm servants reached 40 percent by 1921. It is thus likely that women had participated mainly in casual labor during the nineteenth century, as Roy mentioned, but they started participating in farm servants extensively during the early twentieth century.

#### **(4) Village Artisans and Service Castes**

Change in non-farm occupation structure in Indian context is regarded as a process in which the *jajmani* system gradually declined. The *jajmani* system is a non-market arrangement providing goods and services which are required for agricultural production and for domestic life in one or a group of village communities. The system gradually but steadily declined and has been replaced by market. Yet, the system could be observed in 1970s and 1980s.

The process was brought about partly by a change in demand for goods and services, and partly by a competition with goods manufactured in urban areas. A Kumhar's role as a potter, for example, was eroded by replacement of earthen pots with iron buckets in Persian wheel. Introduction of kerosene lamp reduced the need for a Teli (oil presser).

What about service Castes, Dhobi (washer), Nai (barber), Chuhra and Mussalli (sweeper)? In contrast with artisan castes, it is unlikely that a service provider did face a serious competition from urban area, though a change in life style, safety razor, for example, had affected Nai's work to some extent. Rather it is probable that they wanted to get out of discrimination and severe servitude in a village community, and those eligible left for new opportunity when available.

**Table-12** indicates the number of workers, the WPRs, the proportion of workers whose principal occupation was the hereditary occupation for important artisan and service castes in Punjab in 1911 and 1921. It is noticed from the table that there was a considerable variation in the proportion of workers whose principal occupation was the hereditary to the caste, with the range being from 21.3 percent for Mussalli to 87.4 percent for Sunar (goldsmith) in case of males, and from 9.9 percent for Tarkhan (carpenter) to 86.9 percent for Chuhra in case of females. Lower side were Chamar, Mochi (shoe maker), Machchi (water carrier) and Mussalli, while Sunar, and Nai were higher side. There seems to be a correlation with the cast ranking. It is also noticed that

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<sup>7</sup> Census of India 1881, Punjab, Vol.1, p.384.

the WPRs of all castes declined, while the proportion of hereditary occupation workers rose. There was a different pattern in division of labor between male and Female. A majority of women of Chuhra were engaged in hereditary occupation, while about a half of male workers left the job. On the other hand both male and female workers of Chamar and Mochchi equally participated in non-hereditary occupations.

These figures indicates that a considerable portion of workers left their hereditary occupation by 1911 but this is somewhat misleading. Cultivation and agricultural labor were included in non-hereditary occupations in the table, but many of these caste workers had been traditionally engaged in agricultural labor, as mentioned above. Some indispensable castes, like Lohar, Tarkhan and Nai, were granted a patch of agricultural land and hence they returned cultivation as their principal occupation. These were supposedly a part of traditional system. Yet some portion of agricultural laborers were in fact newly emerged due to a decline in their caste occupations. It is not possible to draw a definite line between them.

Let us try an exercise to confirm if workers of a particular caste left from their hereditary occupation due to a change in demand or to a competition. We take Kumhar caste, one of important artisan castes in Punjab for analysis. Well was one of the most important means of irrigation in Punjab accounting for about 30 percent of total area irrigated. Persian wheels were commonly used for lifting water. Supplying earthen pots for Persian wheel was most important work of Kumhar in addition to pots for water and keeping grains.

The population of Kumhar increased from 467 thousand in 1881 to 583 thousand in 1921 though there was a slight dip in 1911, so that it did not fluctuate abnormally. This indicates that Kumhar was free from the classification error in castes. The male workers in trade in pot was just a few, 276 in 1911 and 536 in 1921, suggesting potters were free from classification error in occupations as well. With special technique it is expected that an entry from other caste members was rare, so that the workers in pottery exclusively came from Kumhar caste itself. Another consideration is that earthen pots started giving place to iron buckets for Persian wheel during the period<sup>8</sup>.

The dependent variable is the proportion of male 'potters, and earthen pipe and bowl makers' to male population of Kumhar. Explanatory variables were (1) well irrigated area per male of Kumhar, (2) the proportion of Kumhar population to total population and (3) GSWPRs for the group of potters. The first explanatory variable is demand for potters work for irrigation. The second one is a proxy indicating demand for pots for domestic life, and it is supposed that when Kumhars are numerous then demand for potter's work per potter declines. The last one is to control age composition of Kumhar population. In addition, year dummy (Yd21) is incorporated in the model to see if there was a structural change. Thus the model for an OLS regression of the proportion of male potters in Kumhar male population is as follows;

$$(4) Y = \alpha_0 + \alpha_1 * X_1 + \alpha_2 * X_2 + \alpha_3 * X_3 + \beta * Yd21 + \epsilon$$

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<sup>8</sup> Singh S.G. (1928), p.23.

where,  $X_1$  is well irrigated area per male potter,  $X_2$  is the proportion of Kumhar population,  $X_3$  is the GSWPR, and  $Yd21$  is year dummy. Pooled district data for 1911 and 1921 are used.

The regression result is shown in **Table-13**. The signs of coefficients of Kumhar's share in population and well irrigated area are as expected and statistically significant. The coefficient of GSWPR is negative as expected but not statistically significant. The coefficient of  $Yd21$  is negative and statistically significant at 5 percent level, implying that there was a structural change between 1911 and 1921. The sign is negative, so the structural change brought about a decline in the proportion engaged in hereditary occupation among Kumhars in 1921. Area irrigated by well increased from 3.07 million acres to 3.70 million acres and the GSWPR for potters fell during the period, yet the proportion of Kumhar male workers engaged in pottery declined. It is likely that a change in Persian wheel structure from earthen pots to iron buckets reduced a need for potters work.

## Conclusion

We scrutinized occupation data of the four census and examined change in work force in Madras and Punjab using district level census data on occupations.

It was found that the census statistics on occupation in 1901, 1911 and 1921 were reliable in a sense that abnormal over- or under-enumeration of female WPR was not detected. The higher WPR in 1881 than 1901 in Punjab could be explained by the fact that women who once classified as industrial workers, spinning for example, exited from work force in the latter year. The classification scheme of occupation applied to Indian condition without adjustment and frequent change in classification made reclassification even at order or sub-order level rather difficult. We have to be very careful at inter-census comparison. Taking those occupation groups that is supposed to have been not affected by the change in classification nor by classification errors would be one way. Nevertheless census statistics is a valuable source to study the change in distribution of workers in British Period.

De-industrialization took place during the late nineteenth century. What we can observe from the census data is that female industrial workers in 1881 were enumerated as cultivators in 1901 in Madras, and they exited from work force in Punjab. Decline in spinning did not lead to swelling of agricultural laborers.

Along with agricultural development, commercialization in particular, the proportion of rent receivers rose and work participation of cultivators declined, both of which led to a decline in overall WPR.

In Madras the number of agricultural laborers increased but the proportion remained at almost same level during the late nineteenth century. Both the number and share of agricultural laborers declined during the early twentieth century. However, there remain classification problems between agricultural laborers and general laborers in Madras and between agricultural laborers on one hand and leather workers and sweepers on the other in Punjab.

Change in demand for goods and services provided in *jajmani* system and competition with

urban products are supposed to have brought about a decline in artisan caste workers in their hereditary occupation. Regrettably the caste and occupation data of censuses did not provide sufficient information on this process. The regression analysis reveals that there was a structural change between 1911 and 1921 in participation in hereditary occupation among Kumhar workers. This suggests the process in which *jajmani* system was gradually undermined.

#### References:

- Calvert H. (1922), *The Wealth and Welfare of the Punjab*, Lahore
- Guha S.(1992), *Growth, Stagnation or Decline? Agricultural Productivity in British India*, Oxford University Press, Delhi.
- Kothari, V.N. (1960) "Long Term Trends in the Employment Pattern in India", *The Indian Economic Journal*, Vol.7, No.4, pp.415-440
- Krishnamurthy J. (1970), "Long Term Changes in the Industrial Distribution of the Working Force in the Indian Union and the States: 1901-1961", in Planning Commission, GOI, *Report of the Committee of Experts on Unemployment Estimate*.
- Krishnamurthy J. (1972) , "The Growth of Agricultural Labour in India - A Note", *Indian Economic and Social History Review*, Vol.9 No.3, pp.
- Krishnamurthy, J. (1976), "De-industrialisation Revisited", *Economic and Political Weekly*, Vol.11, No.26, pp.964-967
- Krishnamurthy, J. (1883), "The Occupational Structure", in Kumar D.(ed) *The Cambridge Economic History of India*, Vol. 2.
- Kumar D..(1983), *The Cambridge Economic History of India*, Vol. 2 c.1757-c.1970, Cambridge University Press.
- Kumar D. (1992), *Land and Caste in South India*, Manohar, Delhi.
- Mukerji S. (1982), "Under-Enumeration in Indian Censuses Impact on Inter-Censal Population Growth: 1901-1981", *Economic and Political Weekly*, Nov.13-20, pp.1870-1875.
- Ono S. and O. Saito (2000), *Estimation of Workers in India during the Pre-War Period* (Senzen Indo no Yugyo Jinko Suikei), Discussion Paper No. D99-26, Institute of Economic Research, Hitotsubasi University.
- Patel S.J.(1952), *Agricultural Labourers in Modern India and Pakistan*, Current Book House,.
- Roy T. (2000), *The Economic History of India, 1857-1947*, Oxford University Press.
- Roy T.(2005), *Rethinking Economic Change in India labour and Livelihood*, Routledge.
- Saraswati B. and N.K. Behura (1966), *Pottery Techniques in Peasant India*, Anthropological survey of India, Calcutta.
- Singh S.G. (1928), *An Economic Survey of Gaggar Bhana A Village in the Amritsar District of the Punjab*, The Board of Economic Inquiry, Punjab.
- Thorner D. and A.(1962), *Land and Labour in India*, Asia publishing House, Bombay.
- Usami Y. (2000), "Changes in the Workforce in India, 1951-1991" in Odaka et. al.(ed.), *Constructing*

*a Historical Macroeconomic Database for Trans-Asian Regions*, Hitotsubasi University,  
Visaria P. (1995), "Rural non-Farm Employment in India Trend and Issues for Research", *Indian Journal of Agricultural Economics*, Vol.50 No.3, pp.400-409.  
Yanagisawa H. (1991), *Study on Social Economic History of South India* (in Japanese, Minami Indo Shakai Keizaishi Kenkyu), Tokyo.

Census of India and other statistics:

Census of India 1881

Vol.3, Report on the Census of India of British India Taken on the 17<sup>th</sup> February, 1881  
Report on the Census of The Panjab Taken on the 17<sup>th</sup> of February, 1881, Vol. 1, Text and Appendices C and D., Vol.2 Appendix Final Tables for British Territory.  
Imperial Census of 1881, Operations and Results in the Presidency of Madras, Vol.1, The Report, Vol.4 Final Census Tables, Provincial Series-Caste, Vol. 5 Final Census Tables-Occupation

Census of India 1891

Vol.19, the Punjab and Its Feudatories, Part 1, the Report on the Census.

Census of India 1901,

Vol.15, Madras, Provincial Tables, Part 1, The Report on the Census., Part 3 Provincial Tables.  
Vol.17, The Punjab, its Feudatories, and the North-West Frontier Province, Part 1 The Report on the Census, Part 2 Tables.

Census of India 1911

Vol.14 Punjab, Part 1, Report, Part 2 Tables.  
Vol.15, Madras, Provincial Series, Part 1, The Report on the Census. Part 2 Imperial and Provincial Tables.

Census of India 1921,

Vol.13, Madras, Provincial Series, Part 1, The Report on the Census, Part 2 Imperial and Provincial Tables.  
Vol.15, Punjab and Delhi, Part 1 Report, Part 2 Tables.

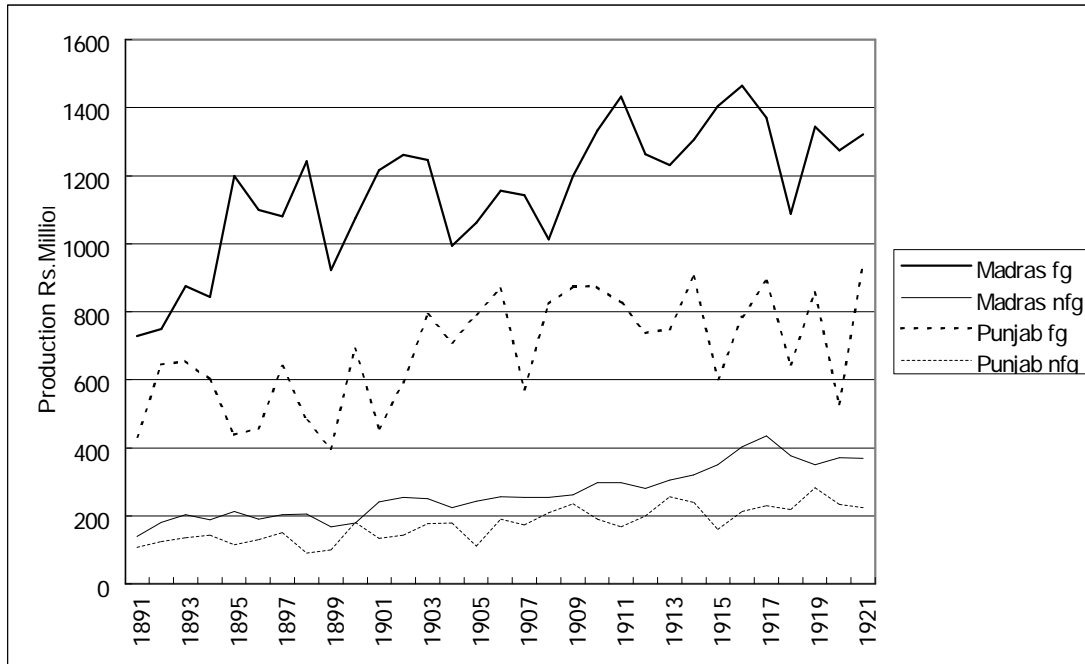
Census of India 1951 Vol.1, Part 1-B, Appendices to The Census Report

Census of India 1961, Paper No.1 of 1967.

Agricultural Statistics:

GOI, Dept. of Revenue and Agriculture, Agricultural Statistics of India, various issues.

Fig-1 Growth of Agricultural Production in Madras and Greater Punjab



Source: Bryn, Agricultural Trends in India, 1891- 1947,

Table- 1 Classification of Occupations

Year	Class	Sub-class	Order	Sub-order	Group
1881	6	18	78		Madras · 480 Punjab · 334
1891	7		24	77	478
1901	8		24	79	520
1911	4	12	55		169
1921	4	4	56		191

Source:

- Census of India 1881 Report on the Census of the Panjab.
- Census of India 1881 Operations and Results in the Presidency of Madras.
- Census of India 1891, Vol.XIX the Punjab and Its Feudatories.
- Census of India 1901, Vol.XV Madras.
- Census of India 1911 Vol.XV Madras
- Census of India 1911 Vol.XIV Punjab
- Census of India 1921, Vol.XIII (Madras).
- Census of India 1921, Vol.XV Punjab and Delhi.

Table- 2 Change in Worker Population Ratios

	Madras		Punjab	
	Male	Female	Male	Female
1881	62.2	40.5	54.7	15.3
1901	62.1	41.8	57.4	10.4
1911	60.8	38.2	58.1	9.4
1921	57.3	32.5	54.0	7.1

Note: For working out the figures of workers, non-workers have to be deducted. The methodology that is given in Census of India 1961, Paper No. 1 of 1967 was applied for the years 1901, 1911 and 1921. The following groups are deducted from the workers in 1881.

Army Pensioner (Officers), Army Pensioner (Soldiers), Theological student, Law Student, Medical assistants, students, (Art) students, Wives, Land proprietors, Landlord, Farmer, House proprietor, Gentlemen independent annuitant, Vagrant Gipsy, Religious devotee, Persons returned as of no Occupation, Persons engaged in Household duties, Prisoners, Pensioners (government), Dependent on relatives. Eunuchs, Pimps, Prostitutes

Table- 3 Reliability Test for Female Worker Population Ratios: Regression Analysis

(1) Madras

Dependent variable		Female WPR			Female WPR/ Male WPR		
Independent variables		Coefficient	t- value		coefficient	t- value	
	Constant	0.5440	14.3602	***	0.8548	14.2586	***
X <sub>1</sub>	Female Muslim %	- 0.8767	- 4.2235	***	- 0.8539	- 2.5992	**
X <sub>2</sub>	Rice area acre/ person	- 0.2287	- 4.0656	***	- 0.2958	- 3.3222	***
X <sub>3</sub>	Non- foodrain area %	- 0.1844	- 2.5748	**	- 0.3296	- 2.9088	***
X <sub>4</sub>	Sheep no/ person	- 0.0457	- 1.7754	*	- 0.0883	- 2.1670	**
D <sub>1</sub>	Deccan	0.0957	3.9479	***	0.1274	3.3195	***
D <sub>2</sub>	West Coast	0.1984	4.4333	***	0.2354	3.3231	***
Yd01	Year dummy for 1901	0.0037	0.2037		- 0.0034	- 0.1211	
Yd21	Year dummy for 1921	- 0.0574	- 3.5977	***	- 0.0641	- 2.5409	**
R <sup>2</sup> adjusted		0.5261			0.3901		
F value		10.4352			6.4360		
No. of samples		69			69		

(2) Punjab

Dependent variable		Female WPR			Female WPR/ Male WPR		
Independent variables		Coefficient	t- value		coefficient	t- value	
	Constant	0.3783	6.0331	***	0.5929	5.6080	***
X <sub>1</sub>	Non- labor force %	- 0.6151	- 3.3112	***	- 0.7900	- 2.5649	**
X <sub>2</sub>	Land population ratio	0.0166	1.6978	*	0.2830	1.7115	*
X <sub>3</sub>	Wheat area acre/ person	- 0.0942	- 3.5417	***	- 0.1623	- 3.6424	***
X <sub>4</sub>	cattles no/ person	0.0426	1.3363				
X <sub>5</sub>	Plough no/ person	- 0.7361	- 2.9238	***	- 1.0846	- 2.6904	***
D <sub>1</sub>	Dummy for Kanda	0.1553	6.0892	***	0.2721	6.6235	***
Yd01		- 0.0037	- 0.3940		- 0.0048	- 0.3063	
Yd21		- 0.0115	- 1.1120		- 0.0166	- 0.9643	
R <sup>2</sup> adjusted		0.6580			0.6242		
F value		20.2408			19.9832		
No. of samples		81			81		

Note The significance level is as follows: \*\*\* 1% \*\* 5% \* 10%

Source: As for workers, same as Table- 2.

As for agricultural statistics. *Agricultural Statistics of British India*. various issues.

Table- 4 Correlation Coefficients between Changes in Share of Agricultural Labourers and General Labourers

	Madras 1)		Punjab	
	Male	Female	Male	Female
1881- 1901	- 0.35	- 0.52		
1901- 1911	- 0.10	- 0.64	- 0.11	0.02
1901- 1911 2)	- 0.48			
1911- 1921	- 0.17	- 0.57	0.05	0.06
1911- 1921 3)	- 0.46	- 0.68		

Note:

1) Madras, Nilgiris and Anjengo were excluded.

2) Exclude an outlier, Trichnopoly.

3) Exclude an outlier, Salem

Source: same as Table- 2.

Table- 5 Distribution of Workers by Industry

(1) Madras

Industry	1881		1901		1911		1921	
	Male	Female	Male	Female	Male	Female	Male	Female
Agriculture Cultivators 1)	38.9%	24.7%	49.2%	42.5%	48.9%	40.9%	48.7%	41.4%
An labors	17.3%	34.2%	18.7%	35.1%	18.7%	34.2%	19.3%	32.9%
Livestock	7.1%	1.5%	3.4%	0.9%	2.4%	0.6%	1.6%	0.8%
Plantation	0.0%	0.0%	0.2%	0.2%	0.1%	0.1%	0.2%	0.2%
Forestrv. Fishina. Hunting	2.1%	0.4%	1.7%	0.2%	1.8%	0.4%	1.8%	0.5%
Mining	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Manufacturing	11.3%	17.3%	10.0%	8.8%	9.6%	7.7%	8.5%	5.8%
Construction	2.2%	1.3%	1.7%	1.3%	1.9%	1.1%	1.5%	1.4%
Trade	5.1%	4.9%	5.4%	5.1%	5.9%	5.5%	6.5%	5.4%
Transport	1.7%	0.2%	1.7%	0.3%	1.4%	0.1%	1.3%	0.1%
Service	7.7%	2.6%	6.7%	3.4%	6.1%	3.5%	5.9%	3.8%
Unspecified/G. Laborers 2)	6.6%	12.9%	1.2%	2.2%	3.1%	5.9%	4.5%	7.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total Workers (1000)	9594	6385	11699	8095	12396	8037	11956	6980
Total Population(1000)	15421	15750	18836	19363	20383	21022	20871	21448

(2) Punjab

Industry	1881		1901		1911		1921	
	Male	Female	Male	Female	Male	Female	Male	Female
Agriculture Cultivators 1)	50.0%	37.3%	51.9%	32.8%	49.3%	21.1%	48.8%	26.4%
An labors	1.9%	0.4%	2.5%	2.1%	5.8%	13.7%	5.6%	5.4%
Livestock	1.8%	0.2%	1.9%	0.5%	3.3%	0.7%	2.4%	0.6%
Plantation	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%
Forestrv. Fishina. Hunting	0.0%	0.0%	0.2%	0.0%	0.3%	0.3%	0.2%	0.2%
Mining	0.0%	0.0%	0.1%	0.1%	0.2%	0.2%	0.1%	0.1%
Manufacturing	23.3%	40.2%	16.6%	30.5%	15.7%	29.8%	15.4%	27.9%
Construction	0.4%	0.0%	0.9%	0.7%	2.4%	1.8%	1.4%	0.9%
Trade	2.4%	0.6%	6.6%	4.4%	6.8%	3.7%	8.0%	4.4%
Transport	1.7%	0.1%	2.2%	0.3%	2.8%	0.7%	2.2%	0.4%
Service	13.5%	17.3%	13.1%	21.9%	12.1%	26.5%	13.0%	28.0%
Unspecified/G. Laborers 2)	5.0%	3.8%	3.9%	6.4%	1.3%	1.5%	2.9%	5.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total Workers (1000)	4891	1158	6260	973	6386	841	6258	680
Total Population(1000)	8936	7587	10929	9377	10992	8983	11588	9585

Note:

1) 'Cultivators' includes vegetable and fruits growers etc.

2) 'General laborers' includes clerks and others unspecified in addition to workers and laborers unspecified.

The classification of groups into industry in Census of India 1961, Paper No.1 of 1967 was applied with some adjustments.

Source: same as Table- 2

Table- 6 Change in Workers in Cotton Textile Industry

(persons)

	1881		1901		1911		1921	
	Male	Female	Male	Female	Male	Female	Male	Female
Madras								
Thread manufacturer Dealer	911	5438						
Cotton manufacture	188157	354577						
Weaver not otherwise described	196610	96597						
Cotton ginning, cleaning and pressing					20067	12486	5770	5700
Cotton cleaner presser ginner			10682	11269				
Cotton ginning mill owner			32	0				
Cotton ginning mill operator			1929	177				
Cotton- spinning, sizing and weaving					385124	193584	215771	102022
Cotton spinning weaving mill owner			60	0				
Cotton spinning weaving mill operator			6791	2186				
Cotton spinner sizer yarn beater			6414	59456				
Cotton weaver hand industry			383132	163036				
Cotton carpet rug maker			555	338				
Total	385678	456612	409595	236462	405191	206070	221541	107722
Punjab								
Cotton ginning, cleaning and pressing			34147	5770	26309	4393	24661	2930
Cotton ginners	3074	1188						
Cotton ginning mill owner			127	12				
Cotton ginning mill operator			1090	100				
Cotton spinning weaving mill owner			42	2				
Cotton spinning weaving mill operator			1685	983				
Cotton spinner sizer yarn beater			1644	42889			4310	50886
Cotton scutchers	27686	4001						
Cotton spinners tiers	250	157852						
Thread factory owner			0	0				
Thread factory operator			34	0				
Cotton- spinning, sizing and weaving					235221	103056	206390	50886
Cotton Cloth Weavers coarse fabrics	258572	88468						
Cotton Cloth Weavers fine fabrics	4406	351						
Cotton carpet weavers	553	57						
Cotton ? Weavers	47	37						
Cotton weaver hand industry			256654	66290				
Cotton carpet rug maker			1171	358				
Total	294588	251954	296594	116404	261530	107449	235361	104702

Source: same as Table- 2.

Table- 7 Change in Share of Rent Receivers and Cultivators

(%)

		Rent receivers 1) Person	Cultivators 2)		Owner cultivators		Tenant Cultivators	
			Male	Female	Male	Female	Male	Female
Madras	1901	4.5	48.9	42.4	36.8	32.9	12.0	9.5
	1911	5.5	48.4	40.7	32.5	27.2	16.0	13.5
	1921	12.2	48.2	41.2	30.9	24.3	17.3	16.8
Punjab	1901	3.9	51.8	32.7	n.a.	n.a.	n.a.	n.a.
	1911	5.3	49.1	21.0	n.a.	n.a.	n.a.	n.a.
	1921	8.2	49.4	26.8	n.a.	n.a.	n.a.	n.a.

Note:

1) Proportion to Agricultural Population (landholders, cultivators and their dependents)

2) Proportion to total workers

Source: same as Table- 2.

Table- 8 Result of Regression of Proportion of Rent Receivers in Punjab

Dependent variable		Rent Receivers/ agricultural population		
Independent variables		coefficient	t- value	
	Constant	0.0302	0.7804	
X <sub>1</sub>	Wheat area %	0.1323	4.0411	***
X <sub>2</sub>	Non- foodorain area %	0.1705	3.1037	***
X <sub>3</sub>	Irrigation %	- 0.0397	- 1.9091	*
X <sub>4</sub>	Crop intensiv	- 0.0393	- 1.2840	
R <sup>2</sup> adjusted		0.2277		
F value		7.0431		
No. of samples		83		

Note The significance level is as follows; \*\*\* 1% \*\* 5% \* 10%

Table- 9 Change in Group Specific Worker Population Ratios (GSWPR)

		(%)		
		Cultivators	Owner Cultivator	Tenant Cultivator
Madras	1901	51.9	52.4	50.2
	1911	48.1	48.1	48.1
	1921	45.8	46.2	45.3
Punjab	1901	34.9	34.9	34.9
	1911	34.5	n.a.	n.a.
	1921	32.1	n.a.	n.a.

Note:

GSWPR=(male and female workers)/ (total workers and dependents)

Source: same as Table- 2.

Table- 10 Results of Regression Analysis for GSWPR of Cultivators

(1)Madras

Dependent variable		GSWPR of Cultivators		
Independent variables		coefficient	t- value	
	Constant	0.7419	19.8882	***
X <sub>1</sub>	Irrigation %	-0.3939	-4.4252	***
X <sub>2</sub>	Land per person	-0.0448	-3.6605	***
X <sub>3</sub>	Rice area %	0.1026	0.0792	
X <sub>4</sub>	Non- foodrain area %	-0.4038	-5.7631	***
D <sub>1</sub>	Deccan	0.0766	2.3507	**
D <sub>2</sub>	West Coast	-0.2068	-3.1495	***
R <sup>2</sup> adjusted		0.4712		
F value		10.9501		
No. of samples		68		

(2)Punjab

Dependent variable		GSWPR of Cultivators		
Independent variables		coefficient	t- value	
	Constant	0.4938	6.6783	***
X <sub>1</sub>	Wheat area %	-0.0703	-2.6000	**
X <sub>2</sub>	Non- foodrain area %	-0.0612	-1.6497	
X <sub>3</sub>	Crop intensiv	0.0741	1.9817	***
X <sub>4</sub>	Cattle/ person	0.0289	2.3743	**
X <sub>5</sub>	Population below ten %	-0.8749	-5.8366	***
R <sup>2</sup> adjusted		0.6366		
F value		30.0769		
No. of samples		84		

Note The significance level is as follows; \*\*\* 1% \*\* 5% \* 10%

Table- 11 Change in Agricultural Laborers and its Composition

		1881	1901		1911	1921		
		Number	Number	Share	Numer	Number	Share	
Madras	Male	Agricultural laborers	1662713	2191562	100.0%	2315200	2307998	100.0%
		Farm Servant		500977	22.9%		958236	41.5%
		Field Laborers		1690585	77.1%		1349762	58.5%
Female	Agricultural laborers	2182655	2840082	100.0%	2752295	2295359	100.0%	
		Farm Servant		161554	5.7%		628759	27.4%
		Field Laborers		2678528	94.3%		1666600	72.6%
Female share in farm servants			24.4%			39.6%		
Punjab	Male	Agricultural laborers	90660	158434	100.0%	368447	348089	100.0%
		Farm Servant		41717	26.3%		146663	42.1%
		Field Laborers		116717	73.7%		201426	57.9%
Female	Agricultural laborers	4779	20779	100.0%	115472	36497	100.0%	
		Farm Servant		1590	7.7%		13441	36.8%
		Field Laborers		19189	92.3%		23056	63.2%
Female share in farm servants			3.7%			8.4%		

Source: same as Table- 2

Table-12 Change in Workers in Hereditary Occupation of Important Artisan and Service Castes in Punjab

Caste	Hereditary Occupation (HO)	Year	Workers		WPR		HO as Principal occupation		NHO as principal and subsidiary occupation		Share of Non hereditary occupation worker (principal)								
											Cultivation			Agricultural labor			Others		
			Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
Chamar	leather worker	1911	383339	88479	63.7%	17.5%	35.7%	26.2%	73.9%	76.2%	31.0%	21.3%	29.1%	31.6%	39.9%	47.1%			
		1921	345111	66404	57.0%	12.8%	35.5%	24.5%	72.6%	78.3%	31.4%	27.4%	26.1%	23.3%	42.5%	49.3%			
Mochi	shoe maker	1911	134387	14737	58.9%	7.8%	66.5%	45.5%	44.5%	56.9%	36.9%	5.3%	9.4%	7.3%	53.7%	87.4%			
		1921	128505	13815	56.1%	7.1%	72.6%	43.1%	35.1%	57.9%	37.3%	3.9%	10.4%	0.8%	52.3%	95.3%			
Chuhra	sweeper	1911	305372	113095	59.8%	27.3%	46.5%	86.9%	63.0%	17.6%	19.5%	4.0%	48.2%	24.3%	32.3%	71.7%			
		1921	229736	84912	57.7%	25.6%	52.7%	93.1%	56.0%	9.4%	21.7%	8.9%	41.6%	9.9%	36.7%	81.2%			
Mussalli	scavenger	1911	96640	16665	58.2%	11.6%	21.3%	36.8%	83.0%	64.8%	22.9%	3.0%	17.9%	11.6%	59.2%	85.5%			
		1921	94941	12518	54.5%	8.4%	28.6%	37.1%	74.9%	65.1%	24.0%	2.3%	18.0%	2.5%	58.0%	95.2%			
Dhanak	scavenger weaver	1911	26042	9145	63.5%	24.8%	51.6%	63.6%	59.5%	42.7%	27.4%	13.3%	28.2%	34.6%	44.4%	52.1%			
		1921	25440	8029	55.9%	19.9%	14.9%	39.7%	88.3%	64.3%	15.5%	16.0%	13.6%	21.3%	70.9%	62.7%			
Daj, Koli	menial servant	1911	60813	17252	67.3%	20.5%	6.7%	4.1%	94.2%	96.7%	83.5%	78.9%	3.9%	4.4%	12.5%	16.7%			
		1921	52180	24477	65.7%	32.6%	90.2%	92.0%	75.2%	10.3%	0.0%	0.0%	24.6%	35.2%	75.4%	64.8%			
Dhobi	washermen	1911	51419	9627	60.8%	13.5%	61.2%	35.1%	48.2%	66.6%	33.6%	3.7%	5.8%	2.1%	60.6%	94.2%			
		1921	45634	6152	57.2%	8.9%	65.3%	53.0%	41.5%	49.2%	41.2%	3.3%	7.4%	0.8%	51.4%	95.9%			
Chhimba	washer dweinn	1911	44926	7119	63.7%	12.4%	41.9%	41.9%	66.6%	60.8%	35.0%	18.1%	7.6%	3.9%	57.4%	78.0%			
		1921	38544	4007	59.0%	7.5%	36.0%	37.7%	68.1%	64.4%	30.9%	13.8%	6.9%	1.0%	62.2%	85.3%			
Jhinwar	water carrier	1911	119613	48749	64.0%	32.1%	55.3%	80.7%	56.4%	27.2%	32.4%	13.6%	13.3%	12.0%	54.2%	74.4%			
		1921	114151	37923	59.3%	24.0%	58.6%	83.0%	49.9%	25.7%	32.1%	16.1%	12.4%	6.3%	55.5%	77.7%			
Machhi	water carrier	1911	74414	24741	59.4%	23.9%	32.0%	22.1%	74.5%	81.0%	37.5%	1.0%	16.3%	1.7%	46.2%	97.3%			
		1921	76657	18331	56.0%	15.7%	53.9%	75.1%	52.8%	29.5%	40.7%	4.6%	8.6%	1.2%	50.7%	94.2%			
Julaha	weaver	1911	212850	55714	61.9%	19.3%	68.7%	64.5%	42.6%	38.1%	36.7%	19.0%	10.5%	7.0%	52.8%	74.0%			
		1921	203427	44774	59.0%	15.4%	71.3%	68.8%	37.3%	33.4%	38.2%	17.4%	9.6%	3.0%	52.1%	79.7%			
Kashmiri	traders weaver	1911	58105	8037	60.7%	9.8%	25.8%	10.8%	79.2%	90.8%	16.4%	4.0%	1.6%	0.6%	82.0%	95.4%			
		1921	49901	5632	56.1%	7.3%	39.6%	27.5%	65.4%	73.5%	20.9%	5.5%	2.8%	0.2%	76.3%	94.3%			
Teli	oil presser	1911	97331	11547	59.9%	8.6%	41.2%	38.7%	69.6%	63.6%	38.6%	20.4%	9.2%	12.5%	52.2%	67.0%			
		1921	92248	7268	55.8%	5.2%	45.6%	41.0%	64.3%	61.1%	38.3%	18.9%	9.6%	1.2%	52.1%	79.9%			
Kumhar	potter	1911	180317	22125	60.3%	8.8%	53.6%	47.5%	59.0%	55.1%	38.5%	24.2%	5.1%	10.5%	56.5%	65.3%			
		1921	164158	17132	56.3%	6.9%	58.0%	44.3%	50.9%	59.6%	38.3%	27.3%	7.3%	2.5%	54.5%	70.2%			
Lohar	ironsmith	1911	104876	8562	59.6%	5.8%	61.3%	12.4%	51.7%	88.8%	59.1%	43.4%	7.0%	11.1%	34.0%	45.5%			
		1921	92186	7999	56.7%	5.8%	68.1%	36.9%	41.5%	65.3%	61.3%	67.8%	9.1%	4.1%	29.5%	28.1%			
Tarkhan	carpenter	1911	215984	13449	60.9%	4.7%	61.9%	9.9%	50.7%	90.8%	61.7%	34.4%	4.5%	9.8%	33.8%	55.8%			
		1921	192888	12230	57.6%	4.4%	68.4%	37.4%	39.7%	65.0%	66.7%	56.8%	7.0%	2.7%	26.3%	40.5%			
Nai	barber	1911	119315	17843	62.1%	11.3%	76.1%	69.1%	38.1%	33.7%	62.1%	23.4%	5.5%	10.8%	32.5%	65.8%			
		1921	113483	12933	58.0%	8.0%	76.4%	68.2%	34.5%	34.8%	58.4%	6.5%	2.0%	35.1%	69.6%				
Sunar	goldsmith	1911	51602	2630	60.3%	3.6%	87.4%	13.1%	20.1%	87.6%	40.7%	16.0%	5.1%	1.0%	54.2%	83.0%			
		1921	33128	2000	57.5%	4.1%	87.4%	57.4%	17.9%	44.0%	41.8%	43.2%	4.5%	1.3%	53.7%	55.5%			

Source: Census of India 1911 Vol. 14. Punjab. Part 2. Tables and Census of India 1921 Vol.15 Punjab and Delhi. Part 2. Tables.

Table-13 Result of Regression of the Proportion of Hereditary Occupation Workers of Kumhar

Dependent variable		Male potters/ Males of Kumhar		
Independent variables		coefficient	t- value	
X <sub>1</sub>	Constant	0.4965	5.1599	***
	Well irrigated area / potter	0.0029	2.8607	***
X <sub>2</sub>	Kumhar share in population %	- 9.8627	- 4.4499	***
X <sub>3</sub>	GSWPR	- 0.1858	- 0.9199	
Yd21		- 0.0573	- 2.4184	**
Adjusted R <sup>2</sup>		0.3672		
F value		9.2677		
No. of samples		58		

Note The significance level is as follows; \*\*\* 1% \*\* 5% \* 10%