GROWTH AND STRUCTURE OF SCHEDULED CASTE WORK FORCE IN UTTAR PRADESH SINCE 1961 — A REGIONAL ANALYSIS

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(Noorul Islam)
**INTRODUCTION**

Population geography is one of the important fields of study in geography. The recent increase in the number of articles written by geographers on human population and associated problems is related to the growing awareness by members of the profession of the importance of population geography. Perhaps most important in elevating population geography to more prominent position among many branches of the discipline has been the influence of Trewartha, his presidential address delivered before the Association of American Geographers in 1953, is one of the most explicit statements on the subject yet to appear.

The collection analysis, and presentation of data relating to spatial distributions and attendant regional patterns become meaningful in population geography only when carried forward a step to include inquiry into the processes which influence indeed create, particular spatial distribution.

The published literature on population geography is mostly related to distribution, density and growth of population, whereas the geographic study of population composition particularly work force and the related problems are relatively few. Work force of population is in no way less significant
than that of growth, distribution in its bearing or the socio-political and economic programmes and problems of a nation. Therefore, the study of work force may be regarded as an important aspect in population geography. The work force is generally conceived of as that portion of population which furnishes labour supply for the production of economic goods and services. Economically active population is the technical term of the general working force of partial section of the total population. The definition of economically active in any particular society must be regarded in terms of the organization of work characteristic of the culture. In primitive societies the working force is hardly distinguishable from the total population. The low level of technology requires the participation of virtually the entire population in the common task of producing goods and services necessary for subsistence with the growth of a market economy in the course of economic development. The working force may thus be said to be a function of the socio-economic structure of society. Spatio-temporal variations in the size and structure of the work force tend to make its involvement in conditioning socio-economic trends and patterns in a country. The magnitude of work force in any area depends upon a variety of economic, demographic and social factors. Economically, type of economy, availability of employment opportunities and levels
of income are important. Demographically, the birth rate and consequent age structure, age at death or longevity of life, migration and average size of family are significant. Socially, levels of literacy and education, status of women in the society, age at marriage and general health standards are vital. There are two methods for obtaining these data: (a) Static methods for ascertaining distribution and structure (census, sample surveys, population commission and enquiries) and (b) dynamic methods for measuring population movement (vital registration of births, marriages and deaths as well as migration records) and change in the population structure (records of change in occupation, employment etc).

The present dissertation which is concerned mainly with the preparatory work proposed to the doctoral research on 'Growth and Structure of Scheduled Caste Work Force in Uttar Pradesh since 1961 - A Regional Analysis', is discussed under five chapters. Chapter first deals with the conceptual framework of work force. Growth and Structure of work force are described in second chapter. Third chapter discusses in details the source and comparability of data. Fourth chapter has the paragraphs of the review
of the available literature. The last chapter i.e. the fifth highlights the methodology and gives a detailed tentative plan for doctoral research.
CHAPTER-I

CONCEPTUAL FRAME WORK OF WORK FORCE

Work force provides information about the human resources and the nature and extent of their utilization. It involves many complications, because the human resource is the most versatile, complicated, subject to change in vertical and horizontal dimensions and unlike 'inanimate resource' is capable of renewing itself. It is obviously very necessary to lay down some rational standard for judging as to what activities should constitute, 'productive work and what degree of performance should be required to qualify a person as worker'. The total population is divided into two groups. One those who are economically active and others who are economically inactive. Actually this distinction is hard to make in the primitive societies or in grossly under developed areas. Those persons, in the population, who fail or do not desire to offer their services in the labour market hereby automatically exclude themselves from the work force. However in its most generalized form the work force is conceived of as that portion of population which furnishes labour supply for the production of economic goods and services.

The basis of classifying persons into work force or otherwise is the respondent's evaluation of his status rather than any objective criterion to be applied by the enumerator. Thus whether or not an occupation is reported from many persons reflects to a considerable extent each individual's evolution of the importance of such an activity in his life. For instance, two students may both work after school hours for pay or profit. They may work the same number of hours per week and may perhaps earn the same amount. However, if one student considers such work of an occupational character and not really important in his scheme of values; he can report himself as without a gainful occupation. If the second, on the other hand, places much greater importance on the work in which he is engaged. He can report an occupation to the enumerator and thus be classified as gainfully occupied.

The term labour force, working population, gainful workers, economically active population, manpower labour supply etc. are closely associated with work force. Manpower is a broader term than working force, it not only includes the latter but generally also includes the potential or maximum available working

2. Ibid, p. 36.
force which might come into being in accordance with economic, social or political considerations. Those who are already engaged in economically productive work and those who can be engaged in productive activities, all those able bodies are called active population.

The principle of classifying persons in the work force on the basis of each individual's activity during a specified reference period is labour force approach. According to this approach the person does not decide whether or not he is a labour force but simply reports to the enumerator the nature of his activities within reference period. The enumerator places him in the labour force, if his activity contributes or intend to contribute to the national product. The individual may work for specified wages or salaries; he may be engaged in entrepreneurial activities or types of self-employment from which he hopes to drive entrepreneurial income, he may contribute to family activities which are designed to yield pecuniary income, or he may be unemployed and seeking work. Though based on a market-oriented concept, the labour force is not a population counter part of national income. It is not an 'input' concept and does not necessarily measure the amount of labour expended in producing the observed national income, since the labour force includes in addition to those who actually work, the unemployed who are seeking gainful employment, and persons with a job but in
some industries not at work or otherwise not actually successful in contributing to the national product.

The use of work force approach involves classification of persons into labour force on the basis of their activity conducted during the specified reference period regardless of their usual activities. This specification of an arbitrary reference period implies the concept of charge and fluidity that is, 'charge over time'\(^3\).

The 'labour force' thus consists of persons employed for pay or profit during the specified week, plus persons who sought during the specified week, plus persons who sought work during that week, the employed. All others aged 14 and over are categorized as not in the labour force.

According to 1981 census the work is defined as participation in any economically productive activity. Such participation may be physical and mental in nature. Work involves not only actual work but also effective supervision and direction of work. The reference period for eliciting the usual work status of a person was one year preceding the data of enumeration. However, certain types of work such as agriculture, household industry, etc. are carried on either throughout the year or only during certain seasons.

\(^3\) Ibid, p. 44.
or parts of the year depending on local circumstances. In such cases the broad time span of the agricultural season was into consideration as the reference period.

Workers are mainly considered on the basis of work as main workers and marginal workers. Main workers are those who have worked for the major part of the year preceding the data of enumeration and those main activity was either in cultivation or as an agricultural labourer or in household industry or in other work. Marginal workers are those who have not worked for the major part of the preceding year concerned but nevertheless have done some work during any time in the reference period. In other words, such workers while not being capable of being classified as main workers, nevertheless perform some work.

The united states census considers that the labour force is made up of all the people 14 years of age and over, who, at particular moment, are either employed or unemployed but looking for work. The labour force includes farm labourers, physician, people who work for themselves as well as those who work for others; people who work for wages, for salaries, and for fees. The labour force includes

members of the armed force except when the term civilian labour force is used. Not considered in the labour force are all people under 14 years of age and all those 14 years of age and over who are doing only incidental unpaid family work (less than 15 hours during the particular week to which the data relate) the later group being mostly student, house-wives, retired workers, seasonal workers enumerated in an 'off' season who were not looking for work inmates of institutions or persons who can not work because of long term physical or mental illness or disability of these groups not in the labour force only inmates of institutions are shown separately.\(^5\)

United Nations recommends the following nine fold industrial classification. These are:

I. Agriculture, forestry, hunting and fishing
II. Extractive industries
III. Manufacturing industries
IV. Construction
V. Electricity, gas and water
VI. Commerce - wholesale and retail, including hotels and restaurants

VII. Transport, warehousing and communication

VIII. Banks, insurance, real estate and business services

IX. Community services, social and personal service

Though the United Nations to classify various economic activities into industrial categories may appear to be the most reasonable one, yet some modification become inescapable keeping in view the local conditions prevalent in different countries. There is great deal of similarity in the industrial classification adopted by a number of developing and developed countries.

Census of India has adopted the following industrial classification for its working population.

I. Cultivators

II. Agricultural labourers

III. Live stock, forestry, fishing, hunting, plantation, orchards and allied activities

IV. Mining and quarrying

V. Manufacturing, processing, servicing & repairs
   (a) Household industries
   (b) Other than household industries

VI. Construction

VII. Trade and commerce
VIII. Transport, storage & communication

IX. Other services.

The classification followed by the Indian census is fairly comparable with the classification of the United Nations. Similarly, in the Peninsula of Malaysia the United Nations industrial classification has been adopted with the only exception that the first category of 'Agriculture forestry, hunting and fishing' has been subdivided into two parts: (a) Agricultural products requiring substantial processing. It is but obvious that the international comparison of even nine categories of industrial classification adopted by the United Nations. There are following three groups.

(i) Primary activities (agriculture, forestry, hunting, fishing, livestock, mining, quarrying etc.)

(ii) Secondary activities (manufacturing construction, power generation etc.)

(iii) Tertiary activities (Commerce storage, transport, miscellaneous services etc.)

Recently, a fourth category of quaternary service (mainly research and administration) has also been recognized by some authors. However, we shall confine
overselves to the traditional three-fold divisions. Though this three fold division of industrial categories is crude because it suffers from over-simplification and overlapping. Yet it provides a better perspective of broad large scale generalization of the world livelihood patterns. About two centuries ago, almost the entire world was predominantly engaged in primary activities and the large scale of secondary and tertiary activities emerged on the world scene at a very late stage. Even today, a very large number of less developed countries has primary activities as the mainstay of their economy, by contrast, the proportion of secondary and tertiary activity workers is very high in developed countries. An increasingly relatively high proportion of workers engaged in secondary activities, which is characteristic of modern world, is a symbol of economic metamorphosis in which there is an increasing use of machine and mechanical power. Similarly, while the growth of secondary sector represents mainly a strengthening to the economic potential of country, a large increment in tertiary activities leading to a well balanced tertiary group, points to a high degree of national sophistication and a flowering of national prosperity.

The International Labour Office has developed a standard classification of industries with which to categorize the responses to this question. This classification has three levels: a 'general', an 'intermediate' and a 'detailed' set of categories. Few Nations of the World for which data are available using the general categories of I.L.O. We could accept as a simple rule that the degree of economic development that a Nation exhibits in inversely proportional to the percentage of its working force employed in an agricultural industry. If we were to use this definition, we could classify the following nations as being the most industrialized in the world. They are Belgium, Netherlands, United Kingdom, East Germany, West Germany, United States, Australia, New Zealand, Hong Kong and Singapore.

The proportion for males is higher than for females. Thus as economic development proceeds and females are able to obtain employment, they tend to do so in the fields of business and service rather than in agriculture. It also does not fully control international differences in definition when a female is in the labour force and when she is simply engaged in normal household work.  

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Female employment tends to be heavily concentrated in the service industry, to a lesser extent, in manufacturing industries and least in agriculture. Outside of the less developed countries, Finland, Austria, Czechoslovakia, Greece, Germany and Poland have substantial share of the female population in agriculture.
CHAPTER-II

GROWTH AND STRUCTURE OF WORK FORCE

In population Geography, the term growth and structure of work force is used in its broadest connotation to cover change in work force during a specific period of time, irrespective of the fact whether the change is positive or negative. Many changes have come in the work force due to age, sex and occupational structure. The number of persons engaged in production of economic goods and services at any given point of time, depends on a variety of demographic, social, economic and cultural factors; the most important of which being those which are associated with the size and age sex composition of the total population. Among the demographic factors fertility, morality and migration are vital factor for changing the work force with respect to age - sex composition and put the limits to the maximum population, who can participate in the economic activity. However, the net change in work force over time and space will depend on the interactions between the trends in specific work participation rates and the age structure of the population.

There are two sets of factors determining the size of the work force, can be noted under the following two heads:

(i) Manpower (that is, population of working ages).
(ii) Specific work participation rates (that is, participation in the work force by age and sex).

**MANPOWER**: Persons in the age range of 20 to 64 or 15 to 59 are classed under this group. Members of this group represent the theoretical strength of the work force of a nation. However, female participation in work is generally much less. According to criterion adopted by the Government of India the number of all males in the age group of 15 to 59 and half of the number of females of this group constitute work force of the country at any time. Vary few children under 15 years of age are economically active in general. Worker population rations in the age group of 0-14 are virtually negligible in industrialised societies, but show a wide range in the less developed countries, where agriculture, livestock and household industries can absorb children for jobs. As, children are engaged in work relatively at a

younger age and on the otherhand customary retirement age in many occupations in developing countries as well as in India is lower than that in western countries and well below 65 years of age, age group population structure often varies considerably among different nations and also among different sections of Nation. Such variations are result of the operation of the host of the factors. The chief among the demographic differentials which play a profound role in shaping the structure of population are fertility, mortality and migration. Besides, social, cultural, economic and political factors also differentiate population structure sometimes directly and sometimes indirectly. We mean the condition of the individual in his occupation. Classifications are often simple and usually the following five categories are adopted: employers, workers, salaried employees, wages earners and unpaid family workers. Industrial status is therefore distinct from social status. Industrial comparability of Industrial status is low due to varying categories and connotations, moreover, because in Great Britain and several other countries.

The term 'structure' usually marks a turning point from the gross and general to the refined and scientific. It refers to the distribution within a population of one
or more individually carried traits and attributes.

The characteristic groupings which make up the peculiar structure of a population at any particular time or its changing structure over period are known as its composition. The characteristic by which population is classified includes such basic demographic variables as age and sex, and such elementary indicators of social organization as nationality, race, colour, language, religion, education and such economic traits as labour force status, occupation and industry.

The population of the working ages is crucial for the determination of the size of labour force. Fertility, mortality and migration have an effect on manpower. Age structure is a primary source of manpower.

AGE STRUCTURE AND DEMOGRAPHIC VARIABLES:

One of the consequences of high birth rate that India has an age structure which is typical of the under developed countries, having a very broad base and a tapering top.


Nearly 39.2 percent of India's population is below the age of 15, and approximately 27.8 percent above the age 59. Thus around 70.2 per cent of population depends upon 33.0 per cent of population in the productive age between 15-59. It indicates that the dependency ratio is high in our country while it is only around 33.5 per cent in developed countries.

A large per-cent-age of dependent population tends to reduce savings and investment and inhibits the rate of economic and social development as a large proportion of the scarce resources are diverted towards consumption also increasingly large number of persons continue to enter the working ages swelling the ranks of the unemployed.

Before the beginning of the first five year plan estimated 3.5 million persons were unemployed in India. At the end of seventh five year plan, their numbers increased to 13.10 million\(^5\).

Fertility and mortality are regarded as more important in this respect, as the external migration in

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the majority of countries is not of significant magnitude. An increase in the fertility produces a "Young Population", one with a large number of persons under 15 years of age. The age curve will be steeper. A population with a diminishing annual number of births, tends to bring about a high percentage of adults and eventually aged persons in the population. The age curve of such a population will be flatter. This is so, because high fertility means a higher birth rate which consequently creates a "bottom heavy" age structure with excessive number of children in proportion to adults. On the other hand, a low fertility means a reduced supply of children, an erosion of the base of the age - pyramid and a shrinkage in the proportion of younger peoples in the total population.

Mortality also affects the sex structure of population. High mortality amongst children may lead to low sex ratio. We know that majority of developed countries, having low mortality rates, are characterized by a relative as well as absolute male dependency. But this is not necessarily negate the theoretical postulation stated above. If mortality rates in Juvenile group are lower than fertility rates, the transfersances from young age group to work force slab will be large and this slab will consequently tend to
grow in size. A similar effect may be expected in the case when the mortality among work force is low. The work force appears to have grown faster in countries in low mortality rates as the case in the European Countries.

Age structure of a population of a region may get appreciably altered by migration even without any substantial change in the numerical magnitude of the population. It is not unlikely that within a specific period a certain number of persons of an age group may leave an area or region while about the same number of persons of different age enter in the area, therefore, no change in the numbers but the age structure of the local population get changed. If the medium age of the emigrants is lower than the medium age of the whole population, the migration will produce instantaneous ageing especially if migration rate is high, and mortality and fertility remain constant. But in case of the country of immigration the results are reverse. The structure of population by economic status and occupation also gets modified by migrations. In recipient areas migration, being strongly adult male

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selective, tends to swell the work force and change the existing occupational structure.

At places where industrial development is in progress the immigration has a favourable impact as it provides cheap labour which, when absorbed in the industry, tends to change the occupational structure of the area in favour of industry and in the long run also helps diversity in the economic activities. In area of labour saturation, and on the other-hand, in-migrants have an impact in favour of services, etc. On the contrary, out migration from an area creates scarcity of labour supply with the consequence that marginal workers, i.e. numbers of female work force, and Juveniles and Senite dependents tend to join the rank of workers.

WORK PARTICIPATION RATES:

In most societies, men are the principal bread winners. As soon as they complete their schooling and/or become physically strong enough to perform some gainful task, boys and young men are expected to join the ranks of the economically active people. It is evidenced by the fact that within specific age-sex groups the ratios of economically active population to the total number of
persons in those groups change with time and vary among different countries and different regions of the same country. This magnitude of being economically active is termed as work force participation. The U.N. and I.L.O. use the terms 'activity rate' for this concept. For a meaningful analysis of factors associated with the specific participation rates, it seems appropriate to study them under the major heads of male and female participation rates with reference to age and residence.

1. MALE PARTICIPATION RATE:

The percentage of population in the senile age group indicates a process of ageing which is the measure of demographic maturity. Physically they are strong enough to perform some gainful pursuits, boys and youngmen are expected to join the ranks of economically active population. They remain in this status untill retirement or ill health or death. Since, there is little irregularity in male participation rates and the relationship between the size of male population and labour supply is much more direct, many researchers have dealt only with males in their analysis.

of economically active population. The details of age specific male work participation is given below

1. CHILDREN - (0-14) :

A lower age limit of work participation has been fixed. In developed countries it start from 19 years of age but in developing countries like India it is 14 or even older depending on the extent to which a significant number of children engaged in gainful work. Since it is customary in farm communities for children to being work at an early age. Children, in rural and traditional type of society, customary work on the family farm or in household industries even during the years when they are attending institutions and they may often put the substantial amounts of work during the peak of season. An inverse relationship between children's participation in work and modernization of society is seen not only on the international but also on the regional level.

In urban areas part-time or seasonal work for children of school age is generally difficult to find and their employment for wages is generally restricted by law.

Their economic activities are, therefore, likely to be narrowly limited until they reach the age of puberty when it is customary and legal for them to become full time member of the labour force.

(ii) **YOUNG ADULT (15-24)**:

Persons of either under twenty or under twenty five and above 15 years of age are consider. to constitute this age group. The activity rates of this age group depend largely on the trends of educational facilities and conditions of employment opportunity. Economic pressure in a subsistence set up which forces several children to do what little they can do to add to family income, would complete nearly universal participation of males in economic activity by the time they are 15 and above even though at a sharply declining levels of productivity. This may delay entry into the work force participation rates in the age group 15-19 and also marginally in the group of 20-24 In the study of the implications of age structures in the economic activities and efficiencies much broader groups which have a direct

relation with the economically productive and dependent segments of population are adopted.  

(iii) MATURE AGE – 15-59:

Persons in the age range of 20 to 64 or 15 to 59 are classed under this group. Members of this age group represent the theoretical strength of the work force of a nation. According to criterion adopted by the Government of India, the number of all males in the age group of 15-59 and half of the number of females of this group constitute the work force of the country of any time.

(iv) AGED WORKER ABOVE 60:

This is the second dependent age group, in which the persons of above sixty or sixty five years of age are included. In Indian census the persons of sixty years and over are considered to be in this group. The persons of the group are not considered fit to do work because of old age and weak physique.

In rural areas a large number of old men are engaged in agricultural pursuits than urban workers. So there are inverse relationship between urbanization and industrialization. In agriculture, the handicrafts and the keeping


of small shops the process of retiring can be gradual and adjusted to the weakening faculties of individuals. It becomes difficult to find a place for the persons who fail to keep with general place. The decline of agriculture is a field of employment in rural areas due to saturation of labour input and increased productivity and contraction of self employment opportunities in urban areas due to emergence of highly organised ways of mass production and distribution of continuing work when they grow old.¹²

2. **FEMALE PARTICIPATION RATES**:  

Here by economic status also gets differentiated by fertility rates in many ways. Concomitant to high fertility is a fact growing work force slab are large and keep on increasing with the steady increase in the number of children incumbent upon the high fertility rate.¹³ The relationship between female participation in the labour force and level of fertility has long been a subject of academic as well as practical interest. The higher incident of female participation in economic activities.

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other things remaining the same, has a negative effect upon the birth rate. The working women who find themselves over burdened with domestic jobs and professional activities do not wish to add to their family.

Kingslay Davis observes that in India where Hindus and Muslims are living together the Muslim have high birth rates than the Hindus. Infact all over the world the Muslims have been observed to have high birth rate. In rural and traditional economies there is a good deal of light and intermittent work in farming, household industries and other family enterprises which women can easily combine with their duties as mothers. In most of agricultural societies of South Asia and Africa, therefore, some highest female participation rates are found. In contrast in urban and industrialized countries jobs are generally arduous and disciplined demanding whole time attachment. It is deduced that the association of relatively low fertility with high labour force participation of women is wide spread in the large urban and persuade more modernized sector of economy.

The relationship between fertility and female participation in economic and female participation in economic activities mostly exists for scanty and inconsistent for developing world. Therefore, the relationship between fertility and work force status of women can be ascertained only unreliably. However, some relationship in limited areas of the developing world are carried out, A.Z. Zarate in Monlerry (Mexico), J.M. Stykos in Lima (Peru) and Turkey and R.H. Waller in Puerto Rico found that fertility of women employed in cottage industries or small scale industries was the same as that of non-working women but that women employed outside the home in modern industry have a relatively low fertility\(^{15}\).

Sovani and Dandekar found no evidence that occupation of the wife was associated with fertility in the rural and urban areas of Nasik and Kolaba in India. The united Nation's Mysore study brings out negative relationship but Drivers' study of fertility in Central India showed that women employees were

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more fertile than those not working for pay.

The second economic factor closely associated with the first is the diet, the influence of which upon the fertility is a matter of great controversy. The recent experiments on animals reveal that high protein intake induces sterility signifying an inverse correlation between birth rate and protein intake. That is why, high fertility is characteristic of poor people and labour classes worker who are most under nourished. There are other factors for changing the fertility.

1. **MARITAL STATUS**: India is one of the countries where age at marriage is still low. This is largely because of the prevalence of child marriages. The percentage of single woman engaged in work force is higher than married woman. All castes in India do not impose restrictions on widow remarriages. According to some studies carried out in rural India, it is found that about one fourth of those who get widowed are remarried. They may be employed in any job. In most nations the participation rates for females tend to reach a peak in the last ten or early twenties, just before marriage or the onset of child bearing. After 25 years of age the participation rate tends to decline as the necessity for house-hold work and
caring, for children make participation less and impossible. In the post marital ages after 40 when their children are mature enough to be in schools, women tend to re-enter the labour force. The percentage of urban females to work force is higher than rural females.

(ii) **EDUCATION**: The standard of education in India is very low in comparison to developed countries and female's rate of education is 24.8 percent. Infact the participation in economic activities is positively correlated with the educational level. Sinha observes that literacy seems to depress female participation in economic activity to an even greater extent. But females with matriculation or higher levels of education show higher participation rate compared with the literate below matriculation in all over India. There may be some reasons why females with education below matriculation level show lower participation rate than those with higher education. Less educated have fewer opportunities for employment and take job with low pay.

The level of female participation in professional course is very low. The other fact is that they should not face a lot of circumstances in their education or service period. Some sectors of economy as social services, public administration, banking, insurance, real estate and certain branches of trade, is a necessary condition of an effective increase in participation amongst educated females.

iii. PER CAPITA INCOME OF FAMILY:

The dominant effect of per capita income on labour force participation rate of females is, therefore, likely to remain uncertain. Expenditure depends upon the income.

In words of Leela Gulati "on an individual level, the going down of female participation would mean that as family income rises and job opportunities for men improve, women may prefer to withdraw from labour market. The argument would be that they prefer their working at home to higher earnings from working outside of their

homes. It is a fact that women tend to withdraw from the labour market when income levels improve. This would support the hypothesis about the backward sloping curve of labour.\(^\text{17}\)

iv. **ECONOMIC DEVELOPMENT** :

Owing to change in economy, the labour force is increased rapidly. Apart from the relative decline of agriculture and the steady advance of the tertiary sector, very significant quantitative changes have occurred in the composition of industry and services. Women's participation in trade is increased in the developed countries and in the developing countries.

In agricultural and industrial economy, in which industry is in its infancy, a carefully conducted inventory may very well show that some of the highest female participation rates are found because in such societies, females are generally expected to do extensive work in the field, intending farm animals and in household industries\(^\text{18}\).

This situation changes with the pace of industrialization and modernization. This development requires redistribution of the labour force among fields of employment to meet needs of changing technology, organization of participation and composition of demand for products. It is difficult to say to what extent women are prevented from taking advantage of the greater opportunities to work in these new fields due to distribution against female labour and to the role assigned to women by the society. In any case this stage is marked by low level of female participation in urban activities, whilst most female workers may be occupied in the domestic service and other personal services calling for few skills and consequently poorly paid.

v. SOCIAL STRUCTURE:

Female labour force, in fact, does not respond uniformly to the same level of economic development unless the social organization is the same. But in some societies the social and cultural system is so different from what it is in others that in the initial stages of

economic development there may be great differences in the response of marginal labour force. It is most strikingly felt when female participation rates of Latin American and middle eastern countries are compared. Although both the groups of countries are characterised by equal developmental levels, yet female participation is at variance.

In different societies different opinions are held in this regard. Some-where female participation in work is honoured, while in other societies non-participation of females is the mark of social status. The opinions are expressed as social taboos of volitional response of women to certain public activities and sanctioned prohibitions and limitations imposed males. This cultural syndrome is reflected strongly in the social structure through institutional mechanism operating to keep women away from participating in the public activities which presume contact with the opposite sex. In countries where the degree of seclusion and exclusion is low, women can participate in economic activities, if suitable job opportunities are provided to them.
PATTERNS OF OCCUPATIONAL STRUCTURE OF POPULATION:

Occupation of working force is closely tied with the existing socio-economic patterns of societies. Change in these patterns affects the occupational structure from all directions. In the course of socio-economic evolution, the high rates of population growth, urbanization and technological development have been associated with marked shifts in the share of variations in industries, in output as well as labour force. General direction of change in the morphology of occupation is traced as a progressive redistribution of the work force amongst economic activities which is characterised by a shift of labour force from primary to secondary and then from both to tertiary sector. This redistribution of workers is a result of technological development in production and changes in the social organization of production and in the composition of demand for products.


For the empirical evidence available, three broad conclusions may be drawn as regards economic growth and occupational structure. In the first stage of economic growth the proportion of the total working force engaged in agricultural and allied occupations declined appreciably but the absolute numbers engaged in these occupations continued to rise\textsuperscript{22}. It is only in the second stage of economic development when an economy is very well advanced that there is a decline in the absolute numbers engaged in agriculture. During the process of economic growth the increase in the tertiary sector is more than that in secondary sector but the difference between the increase in the two sectors may not be very wide.

**PRIMARY OCCUPATIONS:**

The primary occupations are almost exclusively composed of cultivation and agricultural labour which barring a few exceptions, have almost equal shares. Forestry, livestock, etc. and mining and quarrying are negligibly in significant. It is a result of primacy of man's need for food and to the limited extent to which

\textsuperscript{22} Planning Commission, Papers, Relating to the Formulation of the Second Five Year Plan, p. 268.
secondary wants can be satisfied in a pre-industrial stage of society. As the socio-economic development proceeds, the agrarian character of the economy is progressively modified and gradually preponderance of the agriculture is reduced through diversification of economy. Diversification of economy relates to the emergence of new modes of production as an outcome of changing demand patterns toward new types of products, increasing real per capita income and high rates of productivity in all sectors of production.

Low income elasticity of demand for agricultural goods is well known. It may be explained in terms of Engels' Law which states that demand pattern of essential commodities does not change with the fluctuation in real income per capita, i.e., demand for necessities remains constant. It neither increases with the rise in real income per capita, nor decreases with the decline in it, because consumption of such commodities is limited to a certain quantum. Therefore, as real income per head of consumers rises with the economic progress, proportion which they expend on primary products, will certainly fall, though absolute amount which they expend will rise. Under these circumstances with at calling in any other
explanation, a fall in the proportion of work force devoted to primary production may be explained\textsuperscript{23}.

In 1961, 87.68 per cent workers were engaged in primary occupation in rural areas. It is slightly fall in 1981 that is 0.93 per cent in Uttar Pradesh.

**SECONDARY OCCUPATIONS** :

Secondary occupation includes mining and manufacturing industries that demand for the products of primary sector. The proportion of secondary workers in the rural areas in 1971 is 4.98 per cent it is increased 1.07 per cent in 1981. It is 6.03 per cent in 1981. The supply of secondary products requires greater capital and labour investment. On the other hand, the process of economic development which beings by raising the productivity of agricultural workers is, sooner or latter, likely to reach the stage where the demand situation is such that further increase in an average productivity can at best be secured by transfer of labour to other employment\textsuperscript{24}.

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Mining, quarrying and manufacturing in Uttar Pradesh accounted for 10.16 per cent of male work force in 1951. There was an absolute slight increase in numbers in 1961. The number engaged in these industries stood around 65 thousand of the male work force. During 1951-61, manufacturing employment showed a marginal increase from 9.7 per cent in 1951, to 10.11 per cent in 1961. The proportion of secondary workers in the rural areas in 1971 was 4.98 per cent it is increased 1.07 per cent in 1981. It is 6.03 per cent in 1981. Despite the great investment in the secondary occupation, during the span of two plans, a relatively slow growth of manufacturing employment is not so striking as it may seem. For, in development plans priority was given to key industries like basic metal, cement, chemical and heavy engineering. To considerable degree, these involved large scale capital intensive operations with a relatively limited employment potential as compared with traditional industries.

**TERTIARY OCCUPATIONS**

Tertiary occupations of population forms the heterogeneous division including a variety of service activities such as commerce, transportation, construction and a large number of public, professional personnel and domestic
services which differ both in status and skills of persons employed and the type of consumer demand to which they cater. Therefore, majority of economists did not find any consistent pattern in the tertiary employment over time and space. The argument is that the income elasticity of demand for tertiary production is higher than that for the products of primary and secondary sectors, because tertiary products are assumed as "luxuries", and that therefore, services increases more rapidly with economic progress\textsuperscript{25}.

CHAPTER-III

SOURCE AND COMPARABILITY OF DATA

It is now universally recognized that a precise definition of concepts must come before any attempt is made to count. Nothing can be taken for granted. The meanings that have been given to even the most basic terms, such as family or live birth, have varied a good bit from one time or place to another, and the problem of delineating more complex concepts, like the cause of death or internal migration, can become highly technical. Age can be defined in grosser units than single years. If in years, it can be measured to the last birth day or to the nearest one or most precisely, the date of birth can be asked for. Practice varies considerably from one country to another, and in any country from one type of demographic data to another.

In recapitulations of the early population growth of the united states, the breakdown by age and sex is often estimated. Free writes\(^1\) that is 1790 males divided into two age group only, under 16 years, and 16 years and over.

females not classified by age. In 1800-1820 males and females each classified as under 10 years, 10-16, 16-26, 26-45, 45 and over. In 1830-1840 males and females each classified as under 5 years, 5-10, 10-15, 15-20, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80, 80-90, 90-100, 100 and over. In 1790-1810 population was enumerated into slave and free. They were not classified by sex or age. In 1820 population was enumerated into slave and free and by sex and each subgroup classified by age as under 14, 14-26, 26-45, 45 and over. During 1830-1840 population was divided into slave and free and by sex and each subgroup classified by age as under 10 years, 10-24, 24-36, 36-55, 55-100, 100 and over. In the beginning of 1850 enumerators were instructed to ask for the exact age. Since that date it has been defined as that on the last birth day except 1890, when called for age at the nearest birthday. In other population data age is still often undefined. The standard birth certificate form recommended by the public Health Service, for example merely calls for the age of the parents 'at time of this birth' and this inspite of fact that the precise age of the mother in particular is a useful datum in demographic analysis.

The problem of dividing a continuum into classes can be exemplified, again, in terms of age, women are physiologically able to reproduce between puberty and messopause or roughly, between the age of 15 and 45. The general fertility
rate, defined as the number of births per 1000 women in child bearing age group, varies widely according to where the age limits of fecundity are put. In another example, the author of well known work on ageing decided to set 60 years as the lower limit of future research, in spite of the fact that 65 years in the usual dividing point is retirement, social security benefits and similar institutional frameworks or, as a correlative example in 1940 the census Bureau revised the concept of the working population, which from that date on was understood to be part of the age group 14 years and over, rather than 10 years and over.

Once it is decided precisely how to define each demographic category that is to be measured and classified, a count is made. Population data are available primarily in three sources: The census which corresponds in business practice to a periodic inventory of stock; vital statistics, which are like a record of domestic purchases and sales; and international migration statistics, which are comparable to a list of imports and exports. Broadly speaking, students of population studies are interested in two main aspects:
(a) The state of the population at any given time, including its geographic distribution and its structure or composition; and (b) the movement of population in time and space, i.e. its growth or decline by the actions of vital processes and migration.
There are two groups of methods of obtaining data: (a) Static methods for ascertaining distribution and its structure (census, sample surveys, population commissions and enquiries) and (b) dynamic methods for measuring population movement (vital registration of births, marriages and deaths, as well as migration records) and changes of population structure (records of change in occupation, employment, etc.). The former methods have been compared with a photograph an instantaneous record, the latter like a film, are continuous records.

The enumerations of population were carried out in ancient time, the earliest modern censuses of countries took place in Scandinavia and some States of Germany and Italy during the eighteenth century. The first census of Iceland was in 1703, Hesse-Darmstadt in 1742, Hebe-Cassel in 1745, Sweden in 1748, Saxony and Hanover in 1755, Norway in 1760, Denmark in 1769, Spain in 1787, the two Sicilies in 1788, Savoy and Nice in 1789. The first and very important general census of the United States occurred in 1790, although there had been earlier state censuses. In 1801 Britain and France held their first censuses, and subsequently throughout the nineteenth century all European countries initiated periodic population censuses. A census has been defined as "the total process of collecting, compiling and publishing demographic
data pertaining, at a particular time to all persons in a defined territory\textsuperscript{2}.

Periodicity is an important characteristic of census. So also is universality, the need to include every individual in a given area. But the concept of censuses differs. By the de facto approach, used in Great Britain, each individual is recorded at the place where he was found at the time of the census. Pay the de Jure approach, used in United States, people are recorded according to their usual residence. Population mobility, the multiple residences of some and the homelessness of others makes the de Jure approach less satisfactory than the de facto method.

A census is made by the Government. No other Institution can provide the legitimate authority, and thus the presumption of objectivity, or the elaborate and expensive organization required to make a full and accurate enumeration.

The census enumeration is universal. The enumeration of the entire population should be simultaneous, made on a single day. In small nations of the western world this approach is adopted but in so large a country like the United States the census ordinarily take three or four weeks.

Censuses furnish not only information about the population at a given time but, in combination no less significant data about its development over a period. Censuses are more useful if a regular interval is maintained between them. There is a wide variety in the types and quantity of data covered by the different national censuses. One country includes only 12 types of data; some include only 24 types. Most censuses include geographic location, age, sex, marital status, citizenship, place of birth, relationship between the head of the household, religion, educational characteristics and economic characteristics of occupation, industry and status. Much less common are census data of fertility, nuptiability, secondary occupation, income, language, ethnic characteristics, native customs, disabilities and migration.

The United Nations recommend that the census should determine (a) total population (b) sex, age and marital status (c) place of birth, citizenship or nationality (d) mother tongue, literacy and educational qualifications (e) economic status (f) urban or rural domicile (g) household or family structure and (h) fertility. It is a tall order, which in some countries can only be satisfactorily fulfilled by sampling techniques.
VITAL STATISTICS:

The second type of population data — vital statistics, consists of a compilation of local records made of each person, birth changes in Civil status throughout his life time, and his death. In almost every culture there is a religious ritual, to mark births, marriages, deaths and so on. In the western world the registration of these vital events was for centuries the responsibility of the church. Apart from the Inca Empire in Peru, the first secular authority to collect vital statistics was a new England colony in the seventeenth century. Massachusetts became the first state in the Christian world to record the actual events and the dates thereof, rather than the occurrence and date of the subsequent ecclesiastical ceremonies, and the first to place this registration function under the civil authorities rather than under the clergy.

The vital statistics are still collected by local, though secular authorities, so that their completeness and reliability have varied greatly from one region to another.

In the census of 1850 to 1900 attempts were made to find a substitute for National vital statistics by asking how many births or deaths had taken place during a designated period before the enumeration date. The responses were quite inadequate, however, in the census reports themselves it is stated from the 1870 enumeration, and as many as half the deaths from 1900 count.

On the whole, vital registration data tend to be more precise than those of census, except information about census of death and age of women. But again the amount and type of information varies greatly between countries. In some countries over 50 different items of information may occur on the statistical report forms of births, deaths, marriages and divorces, in other as few as 4. In the former case analytical possibilities are almost unlimited whereas in the later there are great blanks in knowledge. In birth statistics, for example, we often have no record of the religion of the parents, or their relationship, occupation, industry, race, literacy and language.

SAMPLE SURVEYS:

The value of sampling in the collection of population data is well known. Costs can be greatly recorded without substantial reductions in accuracy. Sample surveys are
increasingly used in national enumerations, particularly in the former French possessions in Africa. A 10 percent random sample was used in the Royal Commission on Population Family Census of 1946, when one married women in ten was circularized. Samples are now commonly employed in British censuses to obtain more detailed information. In the United States a continuous representative sampling technique is operated. The country is divided into 68 fairly homogeneous regions termed "Strata", which are then subdivided into fairly heterogeneous "primary sampling units" of which one is chosen from each stratum. Then typical areas are selected from each unit according to needs, and in these areas a complete list of dwellings is compiled and a quasi-random sample is obtained.

MIGRATION RECORDS:

The quality of data on migration is usually much poorer than the composition and growth of population. The records are varied. Migrations occur in multiple forms, they are not easily defined or classified. Classifications based on the duration of migration, distance covered or organization (e.g., spontaneous, forced or State organized) are only arbitrary. Migration data cannot be obtained easily especially where they donot cross any significant administra-
In the past much of the information on internal migrants has been obtained from comparison of successive census enumeration after allowance had been made for natural increase. Now some censuses collect information on change of residence and place of birth which facilitates migration analysis. Comparison of data of usual residence and work-place available for the 1921 and 1951 censuses England and Wales enables study of journey to work. In 1961 census of England and Wales a new question was included to obtain information about the volume, frequency, direction and characteristics of internal migrations.

Statistics of internal migrations are available for only a small minority of countries. Moreover, they are notoriously unreliable and have low comparability. Each country collects only the data which it needs for its own administrative purposes. Data are drawn from a variety of sources, frontier control, part statistics, passport statistics of certain categories of travellers, local population registers, work permits for aliens, etc.  

OTHER SOURCE OF DATA:

Only the primary sources of population data have been mentioned. In Britain a number of sources for information and recording data have been established. Among those

the important resources are the Registrar-General's Quarterly Returns, the report of the Ministry of Health, the Ministry of Labour's, Register of Disabled persons, the census of production, the census of Distribution, the Monthly Digest of Statistics, Friendly Society Records, and mainly other sources. Other countries are not so fortunate in this respect. The United Nations Statistical Office, the World Health Organization and International Labour Office, act as Central Agencies for much national data and assist in increasing its comparability.

The comprehensive reliable and convenient source of information on the "work-force" in India is the decennial population census. But doubts are cast on its vertical comparability. The information on economic activities of individuals was collected right from 1872 census, but the definition of economic activities as noted earlier, has not been constant all through. From 1872 to 1951, the approach adopted has more or less been that of 'gainful workers' whereas in 1961 and 1971 censuses the economic data are based on the 'labour force' concept. In 1981 censuses workers are classified as main workers, marginal workers and non-workers. 

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It is deduced that owing to changes in concepts and definitions the data collected at the different censuses are not properly comparable. It is evident that censuses prior to that of 1961 included such persons in the economically active population. Following definitions of 1961, 1971 and 1981 censuses are clearly elaborated. (I) Persons deriving their income from unproductive source of livelihood and (II) those who were unemployed in the fortnight or a week prior to the date of enumerations but conceived themselves to be ordinarily employed. However, those who are regularly working and earning would be enumerated as economically active regardless of conceptual differences from census to census. Nevertheless, treatment of (a) unpaid family workers (b) Persons not engaged in gainful work but earning income from non productive sources (c) Persons with job which they have not joined, and (d) Persons employed before but now out of employment, may create some difficulty in making data of different censuses comparable.

1. Unpaid family workers create great difficulty in the way of comparability of workforce data from census to census. In 1931 the category of working dependents is identical so that of unpaid family helpers. In 1951 there is some ambiguity in the primary instruction, but supplementary instructions clearly enumerated them as non-earning
depends. In the census of 1961 there is clear instruction for their inclusion in the labour force. But 1971 census clearly excludes them from the work-force, however they are recorded under the caption of 'secondary work'. They may be included to make census figures comparable. In 1981 census they are included as non worker.

2. Persons not engaged in gainful work but earning income from unproductive sources are recorded as workers in the census prior to that of 1961, but are excluded from 1961 and 1971. Very likely some of them have reported their occupation when they were economically active and this will inflate the work-force of earlier censuses. But the bias, if any, would not be too significant to inflate the economically active population in earlier censuses relative to that of 1961 and 1971 because persons continue working in traditional economy until removed either by ill-health or death.

3. Persons with jobs which they have not joined may state an occupation in the usual status approach but are not returned as workers under the labour-force approach. But as regarded the census enumeration of 1951, 'income' is equally a criterion with that of occupation for participation in the work-force. It is likely that such persons would

have not enumerated as workers.

4. Persons employed before but now out of employment have had a job attachment and may report themselves as having an occupation under the usual status method. Such persons are under a doubtful category. But the census of 1961, 1971 enumerates them separately, and place them in the category of non-workers in 1981.

The census of India 1961 is the first to draw a sharp distinction between 'industry' and 'occupation'. It provides two separate schemes of classification for industries and occupations, system of industrial classification deviates slightly from the ISIC at the major group level but there will be no difficulty in providing totals or the ISIC major groups by a suitable combination of the appropriate major groups of the Indian scheme. However, 1961 census puts industries into 9 divisions, 45 major groups and 343 minor groups. In 1971 the census adopted two fold way of collecting data on the industrial distribution of the workers. First, persons are classified as workers by their main activity (if it is a productive pursuit). Secondly, if non-workers (by main activity) have any secondary productive activity they are recorded separately. This scheme of classification with some reshuffling at the level of division provides for the same number of
divisions, groups, etc. as in the 1971 census. In 1981 census, the data with particular reference to participation rates, it would be important to recall these in 1981 census definition of main workers, marginal workers and non-workers.

This scheme of redistribution in the 1961 workers in accordance with the industrial categories of 1961 census can be adjusted with the classification scheme of 1971 and doing their works, total population is divided into three categories (main workers, marginal workers, non-workers).

<table>
<thead>
<tr>
<th>Distribution</th>
<th>1961</th>
<th>1971</th>
<th>1981</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cultivators</td>
<td>Industrial Category-I</td>
<td>Industrial Category-I</td>
<td>Industrial Category-I</td>
</tr>
<tr>
<td>2. Agricultural Labourers</td>
<td>Industrial Category-I</td>
<td>Industrial Category-II</td>
<td>Industrial Category-II</td>
</tr>
<tr>
<td>3. Livestock, Forestry, Fishing, Hunting, Plantations, Orchards and A hed Activities</td>
<td>Industrial Category-I</td>
<td>Industrial Category-III</td>
<td>Division (O) of Industrial Category-III</td>
</tr>
<tr>
<td>4. Mining and quarrying</td>
<td>Industrial Category-I</td>
<td>Industrial Category-IV</td>
<td>Division (I) of Industrial Category IV</td>
</tr>
<tr>
<td>5. Manufacturing processing etc. including Household Industry</td>
<td>Industrial Category-I</td>
<td>Industrial Category-V (a+b)</td>
<td>Industrial Categories (Va &amp; Vb)</td>
</tr>
<tr>
<td>6. Construction</td>
<td>Industrial Category-II</td>
<td>Industrial Category-VII</td>
<td>Industrial Category-IV</td>
</tr>
</tbody>
</table>
It must be mentioned that the term 'work participation' as used in this analysis and in other census documents refers to the proportion of workers to the total population and not to the proportion of the labour force to total population. The later is often the conventional use. This distinction must be noted in using these figures for comparative purpose with data drawn from other services.

At the 1961 census there was no attempt to collect information regarding secondary work. At the 1971 census, a specific enquiry was made regarding secondary work and this statement presents the information regarding workers and also those non-workers with secondary work. At the 1981 census, the information relates to main workers and marginal workers and mentioned earlier, these categories are exclusive.

The total work participation rate and the work participation rate in the rural areas have increased slightly over the 1971 level. In the urban areas, this rate has
registered. In the case of males, however, there is a slight fall in the work participation rate between 1971 and 1981 in all areas and in the rural and urban areas separately, as against slight fall in the male work participation rate. In the case of females, the work participation rate has increased from 12.13 percent in 1971 to 14.44 percent in 1981.

If the combined work participation rates, taking into consideration both main workers and marginal workers are considered, it will be noticed that the combined work participation rates are in the case of both males and females higher than that recorded at the 1971 census. The combined work participation rate as recorded at the 1981 census is 37.55 percent which is higher than recorded at the 1971 census. The work participation rate in both rural and urban areas has increased. The male work participation rates in all areas and in rural and urban areas separately are higher than those recorded at the 1971 census. Significant increases may be noticed in the case of female work participation rates. As the female work participation rate in 1971 was recorded to be 14.22 percent which rose to 20.85 percent in 1981. In the rural areas, this rate has increased from 15.92 percent in 1971 to 23.89 percent in 1981. There has been an increase in urban areas also (from 7.18 percent in 1971 to 10.64 percent in 1981).
A comparison of work participation rates whether of main workers of the combined rates of 1981 with the participation rates of 1961, would show that the 1961 rates are higher than the 1981 rates. At this stage it would be difficult to analyse the reasons for this in greater detail because the expectation was that these combined rates at least would be closer to the 1961 work participation rates.

If one were to compare the numbers rather than the rates as such, it will be noticed that the number of main workers and marginal workers together in 1981 has increased considerably over the number of workers in 1961. The increase is of order of 35 percent between 1961 and 1981 or in other words from 182.54 million in 1961, main workers and marginal workers together in 1981 are 247.15 million. In particular the increase in the urban areas between these two census years is sharp and more so in the case of females.

Data regarding non-workers with secondary work as recorded in 1971, and on marginal workers collected in 1981 census reveal an important fact that as the number of non-workers with secondary workers in 1971 was 5.75 million but the number of marginal workers in 1981 was 27.07 million. In this duration both males and females marginal workers recorded in 1981 census are much higher than that recorded at the
1971 census of non-workers with secondary work. This comparative analysis would require further refinement but at this stage it may be said that to a large extent the specific ordering of questions of the 1981 census appears to have yielded dividends in as much as marginal workers have been recorded in large numbers.

The proportion of workers in the population at the 1971 and the 1981 censuses are comparable while the proportion recorded at the 1961 census is higher. While one would have to await more detailed data before one could elaborate on these differences, it would see that the impression that the ordering of the questions in the 1961 census tended to increase work participation is supported partly by this presentation. Between 1971 and 1981 there has been a fall in the proportion of cultivators and of agricultural labourers in the population which is offset to a considerable degree by increase in the population of other workers. This is so in the case of male workers also. In the case of female workers the proportions of cultivators and agricultural workers have increased between 1971 and 1981 and there has been an increase among female workers classified as other workers.

The number of workers by sex in the country and in each of the States and Union Territories as recorded at the
1981 census and for purpose of comparison the participation rates of 1971 are also indicated. The general work participation rate is slightly higher than that recorded at the 1971 census. However, there has been a fall in certain States and Union Territories of the general work participation rate from that it was in 1971. Among the bigger States like Uttar Pradesh fall in the work participation rate is noticed (30.94 to 29.13 percent). At the all India level the male work participation rate of 51.23 percent recorded at the 1981 census is lower than that of 52.62 percent at 1971 census. The male work participation rate has, in fact, generally fallen in all States and Union Territories, except in Gujarat, Haryana, Madharashtra, Manipur, West Bengal and Chandigarh. Female work participation rate at the all India level, in 1981 census has risen by more than two points over what it was in 1971. The female work participation rate has increased over what it was in 1971 in the case of Andhra Pradesh (from 24.16 percent in 1971 to 27.87 percent in 1981), Bihar (8.88 percent to 9.16 percent) Gujarat (10.26 percent to 11.85 percent), Haryana 2.41 to 9.16 percent), Karnataka (14.20 to 19.23 percent), Madhya Pradesh (18.65 to 22.63 percent), Maharashtra (19.70 to 24.39 percent), Orissa (6.81 to 10.88 percent), Punjab (1.18 to 3.09 percent), Tamil Nadu (15.09 to 22.57 percent).
and West Bengal (4.43 to 5.97 percent). The rate has registered a fall between these two census Years in Kerala (13.49 to 12.79 percent) and Uttar Pradesh (6.71 to 6.02 percent).
Manpower (work force) is the basic resource of an employment. How well a country employees its human resources is important in deciding how much it will develop economically. The use of human skill, or the level and structure of workers' participation is a function of the supply of manpower and the demand for it.

The supply of labour force is mainly affected by the population growth and changes in its composition. The demand side includes factors such as the structure and the level of industrialization, which in general determine the level of economic development.

The recommendation of UNO and ILO paid attention to the work force studies is not commensurate with the importance of the problems of development and utilization of human resources to which studies and relevant. So far as regional (spatial) aspect of the subject is concerned, it is the least studied. Relevant literature is however,

found in the chapters dealing with the work force characteristics in the book of regional economics and demography. However, relevant articles in demographic and economic Journals, Governmental reports and other periodicals and proceedings are not numerous. A number of articles related to regional study of work force have been published with reference to India and the other countries of the world.

WORK DONE IN OTHER COUNTRIES

Labour force is a term used specifically to refer to data collection procedures developed in the United States during the late 1930s and currently being used in that and a few countries. A more general term, and one more suited to the scope of this article would be working force. This is more or less equivalent to that United Nations, Labour Statisticians call the economically active population.

In order to analyse the structural changes in the economy of the USA and to identify the forces behind these changes, used and industrial structure of the labour force as the respective of the structure of the economy. By the application of 'shift and share' analysis, they succeeded in measuring intensity and direction of shift in the
industrial structure of different regions. The basic theoretical assumption in the application of the technique is that the deviation of regions' industrial structure from the national norm can at best be attributed to the two factors of structural effects (proportionality shift) and regional effects (differential shift).

'Shift and share' analysis primarily a descriptive method, is very much helpful in the organization of regional data of labour force into a simple analytical form. Despite its limitations, this method has been instrumental for the last three decades in examining the change in the industrial structure of the workers.

An important study of the occupational structure of the workforce is due to R.J. Solomon. This work on the Australian workforce is remarkable for the novelty of technique of analysis employed there in. The methods of which relative strength are calculated called as 'location coefficient method' is of special interest. The method is based on the hypothesis that an ideal distribution of the occupations in a region's workforce should bear the same ratio with the natural distribution of these occupations.

as does the region's work force with the national work force. If a region consists of 10 per cent of the total national work force then the distribution of various occupation in this region should also be the 10 per cent of workers in an occupation, say agricultural, it may then be reckoned as a strong hold of agricultural occupation as compared with the nation.

J.S. Wabe has given a typical study which analyses the spatial variations in labour participation in a large urban centre of London. The relative intensity of the causative factors found operating during the decade 1951-61 has also been determined. A multiple regression analysis is performed to measure the contribution of selected factors. The proportion of active males and females to the total male and female population in age groups of 15 to 64 and 15 to 59 have been introduced by the author to make the proportion analysis more comprehensive and precise. The article is based on a multifactorial analysis of work force participation in the metropolitan region. The average journey time from the Borough to the centre of London, average fare of the journey, the number of jobs in the Borough filled by its male population age 15 and

over, number of jobs in the Borough filled by its female population age 15 and over, social character of the Borough in terms of socio-economic groups of the census number of inmates of institutions, and the number of children in age group of 0 to 4 are taken as the main factors for determining the spatial pattern of the participation rates in the Metropolitan Regions in London.

H.G. Roepke and D.A. Freudenberg[^4] analysed that the employment structure of non-metropolitan, urban centered countries in the 1960s provided the base for their rapid growth in the 1970s. Economic base analyses, using the minimum requirements technique, shows the importance of these countries. Marked regional differences are illustrated at the census division level. One may conclude that non-metropolitan, urban centered countries experienced significant economic growth and change during the 1960s and that the minimum requirements technique is usually way of exploring their economic base structure.

Shizue Tomoda[^5] has attempted to show here that official statistics on female labour force participation


rates are often deficient owing to imprecise definitions of the labour force and to sex biases in United Nations system of National accounts or in data collection procedures. He suggests that a time allocation approach might be a useful method for properly evaluating male and female productive activities. By minimizing the sex bias and conceptual ambiguities found in traditional questionnaires, this approach should make it possible to include in the count at least some of the female activities that have normally been regarded as non labour force.

F.A. Faradzhev has focused attention to solve the problems in a labour surplus region of the USSR. There is a great need to focus attention on planning and investment on the establishment of labour intensive industries. For objective reasons these regions are being embarked, so to speak, for the priority development of relatively labour intensive modern manufactures for which the economy feels a constant need. National interests dictate the necessity of speeding up the development, in particular, of labour intensive branches of engineering, light, coal and other industries in areas where there is.

no scarcity of manpower, moreover as experience has shown, there development has a powerful social impact, above all because it increases employment in sectors that play a key role in scientific and technological personnel, a corresponding increase in remuneration, improved work organization etc. in a world, socio-economic progress is made more dynamic.

A.T.M. Amin Nurul has pointed out that the female participation in the informal sector labour force appears to be very low in Dhaka. The major informal sector occupation in which women participate, is construction where they account for about 20 per cent of the labour force. But in the total sample of 337 location specific enterprises, only three were headed by women.

WORK DONE IN INDIA

Some works have been done on the regional study of work force in India. It was not earlier than 1958 that the first worth while work on regional analysis of

the occupational structure of India's rural population by G.S. Gosal appeared. In this article the occupational structure of the Indian rural population is analysed in a qualitative style. The basic theme of the study appears to examine the diversification in the rural economy of India rather than a study of occupational structure in its demographic, socio-economic and culture connotations. Using the 1951 census data, proportions of non-agricultural population to the total rural population are calculated and presented cartographically. The percentage of non-agricultural rural population vary considerably amongst districts of India. The spatial variability of non-farm population is summarised into four regions. On a close examination of the spatial patterns of non-farm population, author finds out that there exists a positive correlation between non-farm population and specialization in commercial crops, urbanization and industrialization. Certain other factors are also mentioned which have regional significance in the determination of non-farm population.

in rural areas. He also tries to explain the nature of association between the non-farm population and the factors mentioned above.

The most outstanding and comprehensive study of occupational structure of the Indian work force was presented by J.E., Schwartzberg. The general and overall analysis of the occupational structure of male workers is based on 1951 census data but the intensive and differential analysis is mainly based on the statistics obtained from the field work. The objective of this work, as stated by the author, is to investigate the regional patterns of occupations and levels of economic development and find out relationship, if any, between the two.

Richard Anker, M.E. Khan and R.B. Gupta show that there are four non-behavioural factors (questionnaire design, respondents, interviews, labour force definition) to which the relative invisibility of the female labour force in censuses and labour force surveys


is sometimes attributed. Approximately, 90 per cent of adult women were found to engage in labour force or activities.

The time they spent on labour force activities tended to be fragmented, as they usually engaged in several different activities, each for a relatively short time. These results strongly suggest that if the full extent of female labour activity is to be measured, information must be collected on several activities and not on one or even two main activities.

The article published by Mukerji$^{11}$ is based on 1961 census data and the main objectives of the study are identification, description and interpretation of female participation in agricultural labour in U.P. The spatial patterns of the percentage distribution of female participation in agricultural labour reveal considerable variations ranging from less than 15 percent in parts of central U.P. to 95 percent in the Himalayan region. The author has recorded three broad regions of high, moderate and low participation rates. This variation is attributed

mainly to the labour employment potentiality of crops, the erst-while and existing system of land tenure and ownership, the civil conditions, the cultural background of the people and value system of the people.

The article 'female participation in economic activity: A Geographical perspective with special reference to rural areas in India' by O.P. Nayak and Aijazuddin Ahmad deals with the analysis of the spatial variations in female work participation in economic activity in rural areas of the states of Punjab, Haryana, West Bengal, Andhra Pradesh and Maharashtra. Using the data from the census of India, 1971, the authors find out that the Southern states in general show a higher rate of female participation than the States in the northern region. Female participation in economic activities is remarkably low in the rural areas of Punjab and Haryana in comparison to other States. Female workers are generally engaged in primary sector. In the end the authors point out that in the balance sheet of factors determining female participation in work, the non-economic factors emerge as the most

dominant ones. However, in the States with low agricultural productivity (such as Andhra Pradesh and Maharashtra) show a relatively greater impact of economic variables on female participation.

M.M. Wadis' article on variations in labour force participation: An Interregional analysis, is remarkable for its novel method of analysis. This paper is originally contributed to the census centenary seminar, selected papers which are published. The paper attempts to examine the source of interstate (city) differentials in work force participation rates. The inter-state variations in the rates are explained in terms of work force tendencies and age sex composition of the population. The study reveals that the labour participation both for overall population and for different age groups is negatively related with the levels of economic development.

The relationship has been positive in the case of urban labour participation and urban level of economic development. As development takes place, the population tends to move from rural to urban areas and this affects the labour participation in two areas differently. The inter-state (city) work force participation rates vary
from as high as 39.37 per cent in Assam to as low as 28.35 per cent in Rajasthan according to 1961 data. The variations are attributed to work force tendencies reflected in socio-economic factors and age and sex composition of the population. Dadi using the direct standardization methods attempts to demonstrate the relative importance of two types of factors in explaining the variations in labour participation rates. The main point of interest however, lies in method which Dadi has used for the separation of factors associated with the variations in the labour force. The result obtained leads to the condition that variations in age-sex distribution are the most significant in explaining the participation rates. However, an analysis of males and females separately would have been more useful.

A paper remarkable for its in depth analysis was contributed by Bhardwaj, S.M. and Harvey on comparative study of occupational structure of scheduled caste and general population of Punjab as in 1961. Multivariate

analysis was applied to district-wise data. Rural and urban components of the working force were examined separately. It was found that in both rural and urban areas, the two population groups behaved as two fairly distinct components of population with limited overlap on each other's domain. Inter-group differences were small in occupational categories influenced by modern development, such as industries, transport and construction and were large in traditional sources of employment, such as agriculture, landless labour and household industries. Thus an eventual improvement in the economic status of scheduled caste would come not through distribution of land but through their accelerated employment in occupations other than agriculture labour and caste bound manual services in rural environment. Employment in manufacturing, transport and secular services would provide greater hope for the convergence of presently divergent social strata.

S. Mitra and S. Roy\(^{14}\) deal with the changing occupational structure in the hill division of Darjeeling.

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district over a period of 20 years (from 1961 to 1981). The trends of change which emerged have been outlined. The analysis of changes in occupational patterns are based upon grouping of workers in three categories:

(1) Cultivators and agricultural labours (2) workers in house-hold industry and (3) all other workers in non house-hold industry, forest, construction, commerce, transport etc.

At State level Krishan and Chandna\textsuperscript{15} made a detailed study of Haryana's working force and its occupational structure. Haryana had the lowest proportion of workers in the country due mainly to a very high proportion of children in pre-productive age group and extremely low participation of female in work with two-third of its working force dependent directly on agriculture, Haryana remained primarily agricultural despite considerable development in the field of industry and services. One-fourth of the States' rural workers were non-agricultural while one-tenth of its urban workers were agricultural. Two zones around Delhi and Chandigarh were marked by relatively high proportion of agricultural workers. Some shift from agricultural to non-agricultural was observed in the densely populated and more urbanized parts of the State.

CHAPTER V

METHODOLOGY AND PROPOSED PH.D. PLAN

Work force is one of the most important factors of the population of a nation. Economic production and planning depend upon work force. Regional and temporal variations in the size and structure of work force tend to make its involvement in conditioning socio-economic trends and patterns in a country all the more intensive and far reaching. India, being a country of great economic and demographic diversities, presents a good and fertile case for the study of the growth and composition of the work force particularly scheduled caste work force. It is therefore, proposed to undertake A Regional Analysis of the growth and structure of the scheduled caste work force in Uttar Pradesh. Proposed investigation will comprise categorically.

(i) A detailed study of spatio-temporal variation in scheduled caste work force and occupational structure of the scheduled caste work force, (ii) A correlation analysis of the scheduled caste work force components and an explanatory assessment of the determinants and of their specific patterns and (iii) a comprehensive scheme of division of Uttar Pradesh into scheduled caste work force
regions of various orders supplemented with explanatory discussions.

Due to some problems of investigating into the regional pattern and behaviour of the scheduled caste work force involves statistical processing and analysis of huge amount of a variety of data. They call for the formulation of an appropriate theoretical framework and application of the techniques of correlation and significance tests and multivariate analysis. The survey of the literature has revealed that there exists no well developed and established approach to the regional analysis of the scheduled caste work force. For the pursuance of the proposed research it is intended to adopt a geographic approach based on the principles of numerical taxonomy. The numerical taxonomic approach involves three distinct elements.

(a) Systematic - The scientific study of the kinds and diversity of objects and of all relationships among them.

(b) Classification - The ordering of objects (both phenomena and places) into groups on the basis of their relationships, that is, of their association by contiguity, similarity or both.
(c) Taxonomy - The theoretical study of classification (regionalization) including its bases, approach to the present problem is evident. A comprehensive and detailed formulation of a geographic theory in accordance with the principles of numerical texonomy will give a regional theory of scheduled caste work force analysis.

The theory can only be made operational by the application of statistical techniques. In terms of statistics, it is economically a problem of multivariate nature. It will, therefore, be rational to employ such statistical techniques which could deal with multivariate data and could reduce them into few meaningful statistics from which inference could be made about the entire population. Generally, multiple regression and correlation analysis and models of factor analysis and canonical correlation are employed in multivariate problems. Multiple regression and correlation analysis are common place in geographical literature whereas , factor analysis and canonical correlation comparatively recent numerical innovations adopted in geographical studies.

FACTOR ANALYSIS :

Factor analysis has generally been used for the purpose of discovering as to how much of the total
variability exhibiting the primary variables can be accounted for by a few orthogonal variables. In reality factors are underlying dimensions of primary variables. The model involves are 'orthogonal' transformation of set of variables \( X (X_1, X_2 \ldots \ldots X_n) \) into a new set of variables \( Y (Y_1, Y_2 \ldots \ldots Y_n) \) being uncorrelated with one another, notwithstanding the fact that original variables, \( X (X_1, X_2 \ldots \ldots X_n) \), may have been highly correlated. The problem is to find a matrix \( F \) such that

\[
R = FF^T + \Delta
\]

Where, \( R \) is the correlation matrix of \( X \) and \( \Delta = \text{diag} \left( S_1^2, S_2^2 \ldots \ldots S_n^2 \right) \) and 

\[ 1 - S_i^2 = r_{ii} \]

is called communality.

The matrix \( R^* = R - \Delta \) is called reduced correlation matrix. The fundamental equation of factor analysis is thus

\[
R^* = FF^T.
\]

The essence of cononical correlation technique is to transform two mutually dependent sets of variables \( X (X_1, X_2 \ldots \ldots X_p) \) and \( Y (Y_1, Y_2 \ldots \ldots Y_q) \) into a new orthogonal pairs of cononical variates \( U \) and \( V \) so as to maximize the correlation between certain variables \( X \) and \( Y \) sets while others of these correlations are reduced
to zero. Hettling suggested that a linear of $X$, say $X^* = U^1_x$ and another of $Y$, say $Y^* = V^1_y$ and co-efficient $U$ and $V$ are determined, such that the maximum correlation between $X^*$ and $Y^*$ is maximum, the maximum value of correlation called maximum canonical correlation. It can be shown that $\rho^2$ is the dominant latest root of matrix $\begin{vmatrix} \sum_{pp}^{-1} & \sum_{pq}^{-1} & \sum_{qq}^{-1} \\ \sum_{pp} & \sum_{pq}^{-2} & \sum_{qq}^{-2} \end{vmatrix}$ or equivalently, the maximum root of the determinatal equation. 

$$\sum_{pp} \sum_{pq}^{-1} \sum_{qq}^{-1} \sum_{pp}^{-2} = 0$$

Where, $\sum_{pp}, \sum_{pq}, \sum_{qq}$ and $\sum_{qq}$ are within and between group co-variance matrices of $X$ and $Y$.

The statistical methods outlined above are of great value in an investigation which has to go through a lot of data processing and computation. The factor analysis can be used to reduce a large number of variables on the characteristics of scheduled caste work force into few underlying dimensions which without a significant loss of information, can depict well the trends in those characteristics. Factor analysis is also of great assistance in mapping the spatial distribution of variables, phenomena. Instead of mapping a large number of variables, few underlying dimensions can be mapped representing spatial variability of all the variables. The canonical
correlation technique is generally used in the situation where the investigator wants a prior ascertainment of correlation between two mutually dependent sets of variables before going into details of relationship. In the present context before going into details of nature and intensity of relationship between the components of scheduled caste work force and its socio-economic and demographic covariates, it can be ascertained whether there exists any significant association between the two sets or not.

Despite their all validity, none of these methods is helpful in driving multifactor uniform regions. Since, the problem of regionalization in geography is analogous to the classification problem in all behavioural sciences, geography is greatly benfited by the developments in these sciences, particularly be the developments in biometrics and anthropometrics. No standard method of regionalization is developed so far. Many a classificatory algorithms are being used for this purpose, especially those developed by Sokal and Michener, Edwards and Caralli, Sforza and Fisher. All these algorithms start with the computation of a matrix of
'similarity' coefficients which are not more than straight line distances between points given by the formula:  

\[ d_{ij} = \left[ \sum (p_i, r - p_j, r)^2 \right]^{\frac{1}{2}} \]  

Then they try either to minimise the sum of squared distances within groups or to maximise the sum of squared distances between groups. Large samples can not be vigorously and precisely divided into groups by these methods. Besides, factor of memory and time requirements by the computers is involved when these techniques are applied to large samples. On this ground they have proved a total failure. However, it is possible to develop a method of regionalization which can overcome these limitations.

This brief and broad outline of the methodology summarizes the statistical procedure that will be adopted for the doctoral research work which will be organized on the following plan.

**PART-I THEORY:**

**CHAPTERS.**

I  Conceptual Frame work of Scheduled Caste work force.

II  Determinants and Implications of Scheduled Caste work force Analysis.
III Reliability and comparability of data.
IV Techniques and Methods of Analysis.

PART-II - EXPERIMENT:
V The Study Area
VI Scheduled Caste work force Analysis
1. Regional Pattern of Scheduled Caste work participation rate.
2. Change in Scheduled Caste work participation rate since 1961.
3. Scheduled Caste work force regions.
4. Relationship Between Scheduled Caste workers and other variables
VII Scheduled caste male work force.
1. Regional Pattern of Scheduled Caste male work participation rate.
2. Change in Scheduled Caste Male work participation since 1961.
3. Scheduled Caste Male work force regions.
4. Relationship between male Scheduled Caste workers and other variables.
VIII Scheduled Caste Female work force.
1. Regional Pattern of female work participation rate
2. Change in Scheduled Caste Female work participation rate.
3. Scheduled Caste Female work force regions.
4. Relationship Between female Scheduled Caste workers and other variables.

IX

Occupational Structure of Scheduled Caste population.
1. Regional Pattern of occupational structure of Scheduled Caste Population.
3. Occupational Regions.
4. Relationship Between Occupations and other variables.

X

Occupational structure of Scheduled Caste male population.
1. Regional Pattern of occupational structure.
2. Change in occupational structure since 1961.
3. Occupation Regions
4. Relationship Between occupations and other variables.
XI Occupational Structure of scheduled caste female population.

1. Regional Pattern of occupational structure.
2. Change in occupational structure since 1961.
3. Occupation Regions
4. Relationship Between Occupations and other variables.

XII Scheduled caste work force and level of Regional development.

PART-III - CONCLUSION.
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