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## CONTENTS

REGIONAL VARIATIONS IN THE FEMALE AGE AT MARRIAGE IN INDIA: AN ANALYSIS BY AGRO-CLIMATIC ZONES	1 - 26
Vinod Mishra and Vinod Singh	
DEMOGRAPHIC PROCESSES OF URBANIZATION IN DELHI	27 - 36
Ashok Diwakar and M.H. Qureshi	
HOUSING AND HEALTH IN VARANASI URBAN AGGLOMERATION	37 - 44
Seema Rai	
SPATIAL PATTERN OF MIGRATION OF PLANTATION LABOUR AND ITS DYNAMICS	45 - 52
B.N. Shivalingappa and P.D. Mahadev	
INCOME DISTRIBUTION IN RURAL SAGAR	53 - 56
Ramakant Bohare and D.S. Shrivatava	

# REGIONAL VARIATIONS IN THE FEMALE AGE AT MARRIAGE IN INDIA : AN ANALYSIS BY AGRO - CLIMATIC ZONES

VINOD MISHRA AND VINOD SINGH  
HONOLULU, U.S.A. LUCKNOW, INDIA

The effect of agro-climatic factors on female age at marriage is studied by carrying out areal analysis of the 1981 Census data. The study found a close association between agricultural and climatic conditions in an area and corresponding female age at marriage. In general, women in Himalayan regions and coastal areas have higher age at marriage than most hinterland regions. Rainfall, altitude, forest area, land availability and productivity are observed to be associated with female age at marriage. In addition, female age at marriage in rural areas is found to be more sensitive to the agro-climatic conditions. It is hypothesized that with socio-economic and technological development, the agricultural and climatic factors are loosing their grip on female age at marriage in India.

## Introduction

The female age at marriage occupies an important position in the recent demographic literature. It is one of the proximate determinants of fertility and it plays a very significant role in the overall family building process. In most populations, the regular cohabitation starts with marriage and pre- and extra marital sexual unions are not accepted in general. Therefore, the ages at which females marry determine their family size and the pace of future population growth. During past two decades or so, the increase in age at marriage and a shift in proportion of ever married are said to have played a considerable role in reducing fertility in many developing countries of the world - Sri Lanka (Fernando, 1975; Mishra, 1992), Malaysia, Republic of Korea, Taiwan (Cho and Retherford, 1973), China, Hong Kong,

Philippines, Indonesia and Singapore (Smith, 1983) etc.

Several scholars (Sinha, 1951; Kapadia, 1958; Das, 1965 & 69; Agarwala, 1966; Busfield, 1972; Malaker, 1972 & 75; Talwar, et al., 1974; D' Souza, 1979; McDonald et al., 1980; etc.) have attempted to establish some relationship between age at marriage and fertility and many others (Bumpass, 1969; Kale, 1969; Dixon, 1971; Fawett, 1973; Balakrishna, 1976; Reddy et al., 1980; Caldwell et al., 1983; Srivastava, 1983, 84 & 86; Audinarayana, 1985; Neclambar, 1985; Bhagat, 1988; Goyal, 1988; etc.) have tried to determine the factors responsible for changes in the level of age at marriage. But the relationship between age at marriage and fertility is still not clear and the mechanism of change in the level of

age at marriage not yet completely known. Most of these studies have been centered around social and economic factors in search of some concrete framework for marriage age and its determinants. These scholars have mainly focussed on differentials in age at marriage with respect to some important socio-economic variables like education, family income, occupation, urbanization, religion etc.

The authors feel that the relationship between age at marriage and these variables is not unidirectional and straight forward, e.g. age at marriage and education are highly positively associated but it does not necessarily mean that always education determines the age at marriage. In some regions of the developing world, the reverse equation also holds true to a certain degree. A similar argument can also be made about occupation and some other important socio-economic variables. At the individual level, many other forces like beauty, behaviour, dowry, decision making power, etc. determine the age at marriage. These factors are difficult to quantify and relative in nature. They generally cut across the above mentioned important socio-economic variables. Also there are many other variables which do not seem to have very direct impact on age at marriage but certainly guide the behaviour of people. These variables include availability of infrastructure, availability and productivity of land and other resources, topographical and climatic conditions etc.

It is, therefore, argued in this paper that age at marriage needs to be studied in a much broader context in order to better understand the dynamics of this important social variable. This study is a step in that direction and tries to discuss the differentials in the age at marriage of Indian women with respect to agricultural and climatic conditions.

In India, marriage is considered as a socially controlled and directed phenomenon and it is assumed that any change in the level of age at marriage takes place only through a broad social change. Early age at marriage and universalism are prominent parts of the culture of the

traditional Indian society. In India, the level of female age at marriage has been rising during the past one hundred years except for a dip in 1921-31 when, anticipating the passing of Sharda Act, which prohibited female marriages below the age of 14 years, there was a heavy rush for marriages. But the pace of change in the level of female marriage age has been very slow and the cases of very early and pre-puberty marriages are still common in some parts of the country. The latest amendment to the Child Marriage Restraint Act (Govt. of India, 1978) has prescribed the minimum ages at marriage at 18 and 21 years for females and males respectively. Although any violations of these limits are punishable under law, yet they are not practised in general.

India has very diverse topography. It varies from the high Himalayan mountain ranges in the north to huge coastal areas surrounded by the Arabian Sea, the Indian Ocean and the Bay of Bengal in the southern half of the country; from highly fertile Ganga-Yamuna plains at one side to the deserts of Rajasthan on the other etc. The Indian society is agrarian in nature. More than 70 per cent of India's population lives in rural areas and depends on agriculture and other natural resources for its subsistence. These topographical and agricultural factors are very important in the decision making process of families and affect the way of life of the masses in India. There is, therefore, a need to examine these variables in depth and analyse their relationship with social factors like age at marriage and fertility behaviour of the people.

The Planning Commission, Government of India, has divided the nation into 15 regions, delineated on the basis of a commonality of agricultural and climatic factors like soil type, rainfall, water resources, temperature, etc. The basic objective of this regionalization was to utilize the available resources, both natural and man made, in a more scientific manner. The district was taken as the lowest unit of reckoning in the delineation of these agro-climatic zones. These zones cut across the administrative boundaries of various states and union territories

of India and have further been divided into sub-zones on the same grounds. The 15 major zones are :

1. Western Himalayan Region
2. Eastern Himalayan Region
3. Lower Gangetic Plains Region
4. Middle Gangetic Plains Region
5. Upper Gangetic Plains Region
6. Trans-Gangetic Plains Region
7. Eastern Plateau and Hills Region
8. Central Plateau and Hills Region
9. Western Plateau and Hills Region
10. Southern Plateau and Hills Region
11. East Coast Plains and Hills Region
12. West Coast Plains and Ghats Region
13. Gujarat Plains and Hills Region
14. Western Dry Region
15. The Islands Region

The classification of districts (as per the 1981 census administrative boundaries) according to these zones is given in the Appendix-I and a summary of the zonal characteristics is given in the Appendix-II (A & B). These zones have been used to study the regional variations in the age at marriage of females in India.

## Objectives

In this study, an attempt has been made to discuss and analyze the variations in the level of female age at marriage and to explore its relationship with agricultural and climatic factors. The specific objectives are the following :

- i. to discuss the recent levels, trend and socio-economic differentials in the female age at marriage;
- ii. to check the sensitivity of agro-climatic regions with respect to female marriage age and analyze the inter-regional variations in it;
- iii. to discuss and analyze the intra-regional variations in the female age at marriage ;

and

- iv. to discuss the relationship between age at marriage and some important socio-economic variables in the context of agro- climatic conditions.

## Data and Methodology

In India, the Civil Registration System (CRS) which collects direct data on marriages is grossly under-enumerated. The marriages are performed under varied traditions and customs and majority of such marriages go unregistered. The Sample Registration System (SRS) which was started as a stop-gap arrangement to the CRS, to provide the much needed vital statistics on an annual basis, also takes note of marriages taking place in the sampled units. But this useful information is neither compiled nor published. Moreover, SRS does not provide data at the district level, which is considered to be the basic unit for any decentralized micro-level planning in India. However, sample surveys provide some scanty information on this aspect, but this information is not exhaustive and cannot be generalized for any country level planning.

The decennial population census is yet another source of data on marriages in this country. Data on the marital status of individuals have been collected in all Indian censuses. This information has mainly been used to estimate the singulate mean age at marriage and has helped a great deal in understanding the marriage pattern and behavior of the people at various levels. From 1971 census onwards, a direct question on age at marriage has been introduced. In the 1981 census, this question was asked to all ever married women in a 20 per cent sample of enumeration blocks of the major states with more than 10 million population, and in all blocks of the remaining smaller states and union territories. Using these data, the mean age at marriage has been estimated for all currently married females at the district level (Registrar General, India, 1988). These district level data on female mean age at marriage have formed the bases for this study. The data on the characteristics of agro-

climatic zones have been derived from the Planning Commission (1989), the Center for Monitoring Indian Economy (CMIE, 1987) and various census publications.

To study the regional variations in female age at marriage, the district level statistics were first classified according to the 15 major agro-climatic zones for total, rural and urban areas separately. The data for Assam, where the census was not held in 1981, were derived indirectly by projecting the 1971 district level estimates. Subsequently, the mean age at marriage was estimated for each region and area by linearly averaging the district level data. Thereafter, to study inter- and intra-regional variations, a number of statistical indicators were estimated. In discussion, an attempt has been made to find some causal mechanism to explain the regional variations in female marriage age by correlating it with various characteristics of agro-climatic regions.

### Limitations

The estimates of mean age at marriage are for all currently married women, irrespective of the year in which they got married. In other words, these estimates do not refer to any particular time point. These estimates do not indicate the level of age at marriage in the recent past which is expected to be much higher than the previous decades, as indicated by the increasing proportions of never married women in 15-19 and 20-24 age groups. Another important point, which must be kept in mind, is that the duration between age at marriage and age at effective marriage has been diminishing over time and with varied pace in different regions of the country. Therefore, an increase in the level of age at marriage may not always reflect the corresponding change in the age at effective marriage or age at consummation.

Due to the conceptual difference regarding the reference date, the estimates used in this study may not be comparable with those obtained from

data on marital status. Also the female immigration is very much marriage selective in India and this could have affected the estimates of mean age at marriage obtained from marital status data. The estimates for agro-climatic zones have been derived by linearly averaging the district level data, this could also have led to some bias in the estimates. It is, therefore, recommended that the results from this study should simply be regarded as broad guiding patterns.

### Female Age at Marriage : Recent Levels, Trends and Differentials

The mean age at marriage of currently married females in India is estimated to be around 16.7 years in 1981. The corresponding figures for rural and urban areas are 16.5 years and 17.6 years respectively. It is observed that the mean age at marriage for females increased by about one year, from 15.7 years to 16.7 years, during 1971 and 1981. This increase was more in case of rural areas in comparison to urban areas. In rural areas it increased by about 1.1 years, from 15.4 years in 1971 to 16.5 years in 1981, whereas in urban areas it increased only by about 0.8 years, from 16.8 years to 17.6 years, during the corresponding period. At present the minimum age at marriage prescribed under law is 18 years for females, but according to the 1981 census more than 2/3rd of the currently married women got married before attaining this statutory minimum. This proportion has fallen by about 10 percentage points from 1971 to 1981, which indicates the rising trend in the female age at marriage. It is, however, important to mention here that most of these women must have got married before the 1978 Amendment to the Child Marriage Restraint Act came into force.

The level of female age at marriage varies widely across different socio-cultural and economic settings in the country. Table- 1 gives a summary of the mean age at marriage of currently married females according to some important socio-economic variables.

**TABLE-1**  
**Mean Age at Marriage of Females by Religion, Caste,**  
**Education and Occupation in India, 1981**

Sl. No.	Category	Mean Age at Marriage	
		Rural	Urban
<b>1.</b>	<b>Religion</b>		
	All Religions	16.5	17.6
	Hindus	16.4	17.5
	Muslims	16.5	17.4
	Christians	19.2	19.9
	Sikhs	18.9	19.1
	Buddhists	16.5	16.7
	Jains	16.9	18.6
<b>2.</b>	<b>Caste</b>		
	Scheduled Castes	16.1	16.5
	Scheduled Tribes	17.1	17.2
<b>3.</b>	<b>Education</b>		
	All Educational Level	16.5	17.6
	Illiterate	16.3	16.7
	Literate but below Middle	17.1	17.4
	Middle but below Matric	17.8	18.1
	Matric but below Graduate	19.3	19.8
	Graduate and above	21.6	21.9
<b>4.</b>	<b>Worker Category</b>		
	<b>a. Main Workers</b>	16.5	18.2
	Cultivators	16.4	--
	Agricultural Labourers	16.3	--
	Manual Workers	16.8	16.8
	Non-manual Workers	19.1	20.8
	<b>b. Marginal Workers</b>	16.4	16.8
	Cultivators	16.3	--
	Agricultural Laborers	16.5	--
	Manual Workers	16.7	16.7
	Non-manual Workers	16.7	17.6
	<b>c. Non-workers</b>	16.5	17.6

**Note :** 1. Figures are excluding Assam where the census was not held in 1981  
2. In urban areas manual workers include cultivators and agricultural laborers.

**Source:** Registrar General, India, 1988.

The above table shows that among the six major religions, the mean age at marriage for females in rural areas is the highest for Christians being 19.2 years. Christians are followed by Sikhs with mean age at marriage of 18.9 years. Hindus, Muslims and Jains have significantly low level of female age at marriage (around 16.5 years), in comparison to Christians and Sikhs. In urban areas also Christians and Sikhs have the highest (19.9 years) and the second highest (19.1 years) levels respectively. They are followed by Jains (18.6 years), Hindus (17.5 years), Muslims (17.4 years) and Budhists (16.7 years) in that order. Within religion, rural urban variations are also evident from this table.

It is observed from the above table that the mean age at marriage for Scheduled Caste women is comparatively lower than that for Scheduled Tribe women in both rural and urban areas. In case of Scheduled Castes, its level is considerably lower than the country average. Another point worth noting is that the rural urban differentials are very narrow for both Scheduled Castes and Scheduled Tribes.

The level of female education is considered to be one of the most important determinants of their marriage age. This table indicates a very clear relationship between age at marriage of currently married females and their completed level of education. In rural areas, the mean age at marriage of illiterate women is 16.3 years and there is a gradual increase in its level with increase in the level of education. It is the highest (21.6 years) in case of graduate and more qualified women. In urban areas also a similar increasing trend, corresponding to increasing level of education, is observed. The matric level seems to be the threshold point, beyond which there is a sudden jump in the level of female mean age at marriage.

Women participation in the work force is another important factor which affects their entry into marriage union. More important is the

worker category to which they belong. From the preceding table, it is observed that in rural areas its level is almost same for main workers, marginal workers and non-workers. While in urban areas, it is significantly higher for main workers (18.2 years) in comparison with marginal workers (16.8 years) and non-workers (17.6 years). The cultivators and agricultural labourers have lower levels than other workers. Those engaged in non-manual activities have significantly higher age at marriage. Among non-manual workers, those women who are main workers have a considerably higher mean age at marriage than those who are marginal workers.

### Inter - District Variations

In India, district is the lowest administrative unit identified for micro level decentralized planning. District level variations are, therefore, important to study for any meaningful policy oriented research. As mentioned before, the level of female age at marriage is still very low in many parts of the country. According to the 1981 census, in 300 out of total 412 districts of India, the mean age at marriage of currently married females is estimated to be below the minimum level prescribed under law, i.e. 18 years. Of these for around 40 per cent districts its level is below 16 years.

Table 2 shows that the overall district level variability in the female mean age at marriage is much more in rural areas in comparison to urban areas. For individual districts, it varies from a low level of 14 years in Tonk district of the Central Plateau and Hills Region to a high of 21 years in Mokokchung district of the Eastern Himalayan Region. The corresponding figures for rural areas are 13.7 years in Tonk district and 21.2 years in Mokokchung district respectively, and those for urban areas are 15.1 years in Tikamgarh district of the Central Plateau and Hills Region and 20.6 years in both Aizwal and Lunglei districts of the Eastern Plateau and Hills Region, in that order.

**TABLE- 2**  
**Inter-District Variations in the Female Age at**  
**Marriage, India, 1981- All Areas**

India	Age at Marriage	Maximum	Minimum	s.d.	C.V.
Total	16.7	21.0	14.0	1.50	8.81
Rural	16.5	21.2	13.7	1.57	9.31
Urban	17.6	20.6	15.1	1.17	6.70

**Note:** *s.d. Standard Deviation; C.V. - Coefficient of Variation.*

### Inter- Regional Variations

The average female age at marriage varies widely across the agro-climatic zones. In Table- 3, the agro-climatic zones have been classified into four categories viz., Very Low, Low, Moderate, and High, on the basis of their age at marriage of all currently married females.

This distribution of zones brings out a very clear regional pattern in the female age at marriage in India. The women living in the Himalayas and coastal regions of the country, fall in moderate or high age at marriage categories. While the hinterland women typically fall in low or very low categories and obviously marry at much younger ages than those who live in boundary regions of the country. The Trans-Gangetic Plains Region which is associated with very high agricultural productivity, is the only exception to the above general pattern.

Within Himalayan Regions, the Eastern Himalayan Region which has a much higher rainfall, lower temperatures and more humid tropical or sub-tropical climate, with tropical rain forests as the dominant vegetation, in comparison to the Western Himalayan Region, has higher age at marriage of females. Between the coastal regions, West Coast areas have higher age at marriage than

East Coast areas. Within the hinterland, regions comprising the peninsular plateaus and hills in the southern half, have relatively higher marriage age than the northern plain regions. In Figure-I all the major agro-climatic zones and districts contained in each zone have been demarcated. Further, two broad categories of regions, viz., those with female mean age at marriage below 17 years and others with above 17 years, are also shown. The observations from the map confirm that the regionalization of the nation according to agricultural and climatic factors is sensitive to the level of female age at marriage. In the following, these inter-regional differentials are discussed in detail.

Table 4 shows that the Eastern Himalayan Region has the highest female age at marriage (18.80 years), closely followed by the West Coast Plains and Ghats Region (18.71 years). The other two regions with reasonably high levels of female age at marriage are the Gujarat Plains and Hills Region and the Islands Region with 18.34 years and 18.07 years female mean age at marriage, respectively. The Central Plateau and Hills Region has the lowest level (15.33 years). The Middle Gangetic Plains Region and the Western Dry Region, are other regions which have very low female age at marriage viz. 15.80 years and 15.94 years respectively.



## Female Age at Marriage by Agro-Climatic Zones

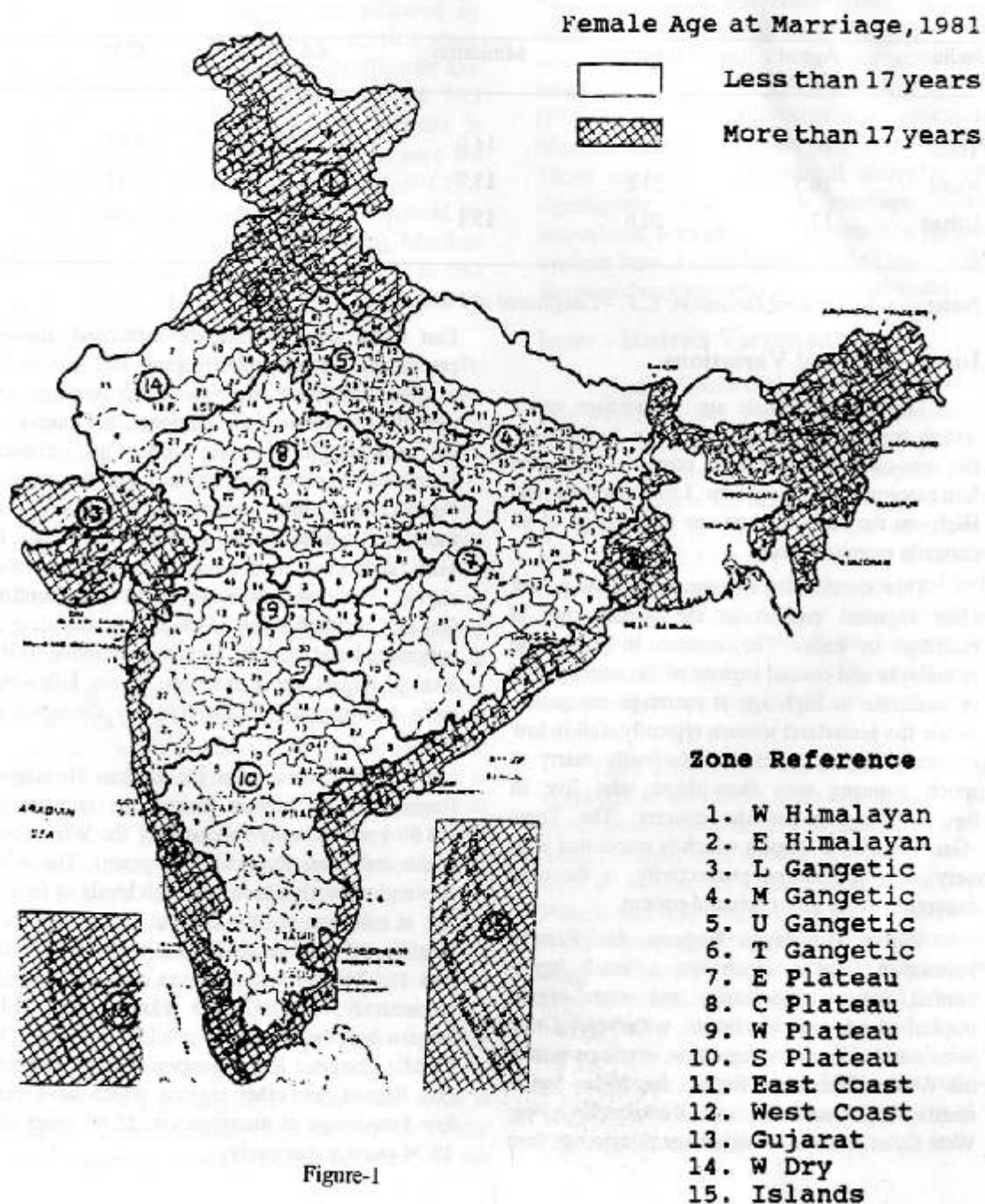


Figure-1

TABLE-3

### Classification of the Agro-Climatic Zones according to the Mean Age at Marriage of Females, 1981

Age at Marriage Category	Agro-Climatic Regions
Very Low (below 16 years)	1. Middle Gangetic Plains Region
	2. Central Plateau and Hills Region
	3. Western Dry Region
Low (16-17)	1. Lower Gangetic Plains Region
	2. Upper Gangetic Plains Region
	3. Eastern Plateau and Hills Region
	4. Western Plateau and Hills Region
	5. Southern Plateau and Hill Region
Moderate (17-18)	1. Western Dry Region
	2. Trans Gangetic Plains Region
	3. East Coast Plains and Hills Region
High (above 18 years)	1. Eastern Himalayan Region
	2. West Coast Plains and Ghats Region
	3. Gujarat Plains and Hills Region
	4. Islands Region

TABLE-4

### Inter-Regional Variations in the Level of Female Age at Marriage 1981 - All Areas

Sl. No.	Agro-Climatic Region	Mean Age at Marriage Females		
		Total	Rural	Urban
1.	Western Himalayan	17.36	17.29	18.06
2.	Eastern Himalayan	18.80	18.78	18.82
3.	Lower Gangetic Plains	16.33	16.13	17.03
4.	Middle Gangetic Plains	15.80	15.73	16.58
5.	Upper Gangetic Plains	16.58	16.38	17.47
6.	Trans Gangetic Plains	17.79	17.57	18.23
7.	Eastern Plateau and Hills	16.45	16.36	16.90
8.	Central Plateau and Hills	15.33	15.10	16.20
9.	Western Plateau and Hills	16.03	15.69	16.85
10.	Southern Plateau and Hills	16.53	16.38	16.99
11.	East Coast Plains and Hills	17.35	17.30	17.44
12.	West Coast Plains and Ghats	18.71	18.63	18.96
13.	Gujarat Plains and Hills	18.34	18.21	18.45
14.	Western Dry	15.94	15.91	16.01
15.	The Islands	18.07	17.83	18.47
<b>INDIA</b>		<b>16.70</b>	<b>16.50</b>	<b>17.60</b>
	Minimum	15.33	18.78	18.96
	Maximum	18.80	18.78	18.96
	s.d.	1.08	1.11	0.92
	C.V. (in percentage)	6.46	6.71	5.21

The rural areas of these regions where the agro-climatic factors are expected to have much more influence, also have an almost parallel pattern of female age at marriage. In rural areas, it varies from 18.78 years in the Eastern Himalayan Region to 15.10 years in the Central Plateau and Hills Region, exactly in the same order of regions as it did in the total case. In urban areas, however, there is some discrepancy across the agro-climatic regions, from the pattern observed in rural areas. In case of urban areas, the West Coast Plains and Ghats Region has the highest age at marriage (18.96 years). This West Coast region is followed by the Eastern Himalayan Region (18.82 years), the Islands Region (18.47 years), the Gujarat Plains and Hills Region (18.45 years) and the Trans Gangetic Plains Region (18.23 years), in that order. On the other extreme, the Western Dry Region and the Central Plateau and Hills Region have the lowest (16.01 years) and the second lowest (16.20 years) levels respectively. The overall inter-regional variability is slightly more in rural areas in comparison to urban areas.

### Intra - Regional Variations

Although the 15 major agro-climatic regions have been delineated on the basis of commonality of various agricultural and climatic factors, there are sizeable, within region, variations in these factors. Accordingly, each region has been further divided into 4 or 5 more homogeneous sub-regions. These sub-regions are not discussed in detail within the scope of this paper but they are referred by the author while analyzing intra-regional variations (for details see Planning Commission, 1989). The female age at marriage also varies significantly from one sub-region to other, within each region.

Table- 5 presents the distribution of districts according to the female mean age at marriage for all major agro-climatic zones. This classification

shows that for 13 out of 15 regions, the distribution of districts is either left skewed or right skewed. A left skewed distribution indicates that the majority of districts are concentrated in higher age at marriage categories, whereas a right skewed distribution indicates the reverse that the majority of districts are in lower age at marriage categories. The regions 7 and 10, i.e. the Eastern Plateau and Hills Region and the Southern Plateau and Hills Region, have a bi-modal distribution. The Trans -Gangetic Plains Region also has a small second heap in the left tail of the distribution. Another important point which emerges out from this classification of districts, is that the regions with lepto-kurtic curve are, in general, more homogeneous with respect to agricultural and climatic conditions. That means, the higher peak or the higher concentration of districts in one category of marriage age, is associated with higher degree of homogeneity of agro-climatic factors in that region.

The above analysis indicates that the intra-regional inter-district variability in the female age at marriage, is positively associated with the corresponding variability in the agricultural and climatic conditions. For further analysis of this intra-regional variability tables 6, 7 and 8 have been prepared and are being discussed below.

Table- 6 shows that the Southern Plateau and Hills Region observed the highest intra-regional variability, followed by the Eastern Himalayan Region and the Islands Region in that order. On the other extreme, the Gujarat Plains and Hills Region, perhaps the most homogeneous region of the country, observed the least within region variability in the female age at marriage.

The other two regions namely the Lower Gangetic Plains Region and the Middle Gangetic Plains Region, with very low intra-regional variability, are also amongst the most homogeneous regions of the country.

TABLE -5

**Distribution of Districts According to Mean Age at Marriage of Females, 1981 - India & Agro-Climatic Zones**

Sl. No.	India/ A-C Zones	No. of Districts	Female Age at Marriage			
			< 16	16-17	17-18	18+
1.	W Himalaya	34	1	11	15	7
2.	E Himalaya	50	1	3	9	37
3.	L Gangetic	12	5	6	0	1
4.	M Gangetic	36	23	12	1	0
5.	U Gangetic	31	5	18	8	0
6.	T Gangetic	27	1	7	5	14
7.	E Plateau	28	12	4	10	2
8.	C Plateau	45	35	9	1	0
9.	W Plateau	32	12	16	4	0
10.	S Plateau	34	12	7	11	4
11.	E Coast	25	2	6	9	8
12.	W Coast	27	0	0	5	22
13.	Gujarat	19	0	0	3	16
14.	W Dry	9	5	3	1	0
15.	Islands	3	0	0	2	1

TABLE -6

**Intra-Regional District Level Variations in the Female Age at Marriage, (Females) 1981 - Total**

Sl. No.	Agro-Climatic Regions	No. of Districts	Age at Females Marriage	Max.	Min.	C.V.
1.	W Himalaya	34	17.36	20.3	16.1	6.13
2.	E Himalaya	50	18.80	21.0	15.7	6.62
3.	L Gangetic	12	16.33	18.2	15.8	3.87
4.	M Gangetic	36	15.80	17.0	14.7	3.29
5.	U Gangetic	31	16.58	17.9	14.8	4.02
6.	T Gangetic	27	17.79	19.2	15.7	6.18
7.	E Plateau	28	16.45	18.0	14.8	5.72
8.	C Plateau	45	15.33	17.1	14.0	5.10
9.	W Plateau	32	16.03	17.9	14.2	5.34
10.	S Plateau	34	16.53	19.0	14.3	8.06
11.	E Coast	25	17.35	19.5	15.8	6.13
12.	W Coast	27	18.71	20.3	17.3	4.52
13.	Gujarat	19	18.34	19.2	17.5	2.52
14.	W Dry	9	15.94	17.3	15.1	4.85
15.	Islands	3	18.07	19.7	17.0	6.49

**TABLE - 7**  
**Intra-Regional District Level Variations in**  
**the Female Age at Marriage, 1981 - Rural**

Sl No.	Agro-Climatic Regions	No. of Dist-riicts	Age at Marriage Females	Max.	Min.	C.V.
1.	W Himalaya	34	17.29	20.3	15.8	6.30
2.	E Himalaya	50	18.78	21.2	15.6	7.04
3.	L Gangetic	12	16.13	16.4	15.6	4.14
4.	M Gangetic	36	15.73	17.0	14.6	3.54
5.	U Gangetic	31	16.38	17.8	14.8	3.72
6.	T Gangetic	27	17.57	19.2	15.5	6.88
7.	E Plateau	28	16.36	18.2	14.6	6.49
8.	C Plateau	45	15.10	17.1	13.7	5.32
9.	W Plateau	32	15.69	17.9	13.9	6.05
10.	S Plateau	34	16.38	19.2	14.2	8.41
11.	E Coast	25	17.30	19.6	15.7	6.14
12.	W Coast	27	18.63	20.3	17.2	4.85
13.	Gujarat	19	18.27	19.3	17.1	3.12
14.	W Dry	9	15.91	17.3	15.0	5.16
15.	Islands	3	17.83	19.7	16.7	7.46

For each of the 15 regions, the within region variability in female marriage age is significantly higher in rural areas in comparison to urban areas (Tables 7 and 8). This result is in confirmation with the similar result at the all India level. It indicates that urban areas tend to narrow down the gap in the level of female age at marriage, irrespective of their location. The location, however, determines the degree of this tendency.

Another important point to note here is that though the extent of variability in urban areas is much lower than the corresponding variability in

the rural areas, the order of regions with respect to the degree of variability, remains the same in both cases. This shows that although the within region diversities have their impact on both rural and urban areas, the force of this impact is stronger in rural areas.

While trying to correlate the above discussed intra-regional variations in the female marriage age with sub-regional agro-climatic characteristics, a number of interesting observations have been made. These observations are briefly summarized here. In both Himalayan Regions, the higher altitude, higher

**TABLE - 8**  
**Intra-Regional District Level Variations in the Female**  
**Age at Marriage, 1981 - Urban**

Sl No. Regions	Agro- Climatic	No. of Districts	Age at Marriage (Females)	Max.	Min.	C.V.
1.	W Himalaya	34	18.06	19.7	16.9	4.31
2.	E Himalaya	50	18.78	20.6	16.7	5.22
3.	L Gangetic	12	17.03	18.2	16.5	2.67
4.	M Gangetic	36	16.58	17.2	15.9	2.15
5.	U Gangetic	31	17.47	18.5	16.4	3.16
6.	T Gangetic	27	18.23	19.4	16.7	4.12
7.	E Plateau	28	16.90	18.1	15.6	2.97
8.	C Plateau	45	16.20	17.4	15.1	3.72
9.	W Plateau	32	16.85	17.8	15.8	3.20
10.	S Plateau	34	16.99	18.7	15.2	5.75
11.	E Coast	25	17.44	19.3	16.1	5.74
12.	W Coast	27	18.96	20.2	17.6	4.09
13.	Gujarat	19	18.45	19.0	17.0	2.50
14.	W Dry	9	16.01	16.9	15.4	3.25
15.	Islands	3	18.47	19.7	17.5	4.97

rainfall and lower temperature areas have comparatively higher female age at marriage. Sub-regions with higher agricultural productivity, are in general found to be associated with higher age at marriage of females. The pockets with high proportion of forest area, have relatively higher age at marriage. The coastal areas, in general, have higher age at marriage than the interland areas within each of the East Coast Plains and Hills Region, the West Coast Plains and Ghats Region and the Gujarat Plains and Hills Region.

These observations, however, do not specifically tell that what level of agricultural productivity or which climatic factor(s) or what combination of these agro-climatic conditions is associated with a particular level of female age at

marriage in that region. In order to answer these questions, a much more rigorous analysis needs to be carried out.

#### **Female Age at Marriage, Socio-Economic Variables and Agro-Climatic Conditions**

The previous analysis has indicated that female age at marriage has a very clear regional pattern according to the agro-climatic conditions. In order to further verify this pattern and study the relationship between female age at marriage and some important socio-economic variables through agro-climatic factors, the following correlation matrix (Table- 9) has been generated.

**TABLE - 9**  
**Correlation Matrix**

	FA	CL	LP	RF	POV	UE	FL	URB	AAM
FA	1.00								
CL	-.30	1.00							
LP	.38	-.73	1.00						
RF	.81	-.45	.54	1.00					
POV	-.26	.02	-.33	-.24	1.00				
UE	-.08	-.33	.53	.40	-.37	1.00			
FL	.37	-.45	.67	.63	-.59	.76	1.00		
URB	.05	-.02	.39	.16	-.30	.50	.69	1.00	
AAM	.47	-.36	.55	.62	-.74	.48	.75	.29	1.00

Where :

FA = Per cent Forest Area,

CL = Per Capita Cultivable Land Availability,

LP = Per Hectare Land Productivity,

RF = Average Annual Rainfall,

POV = Per cent Population Below Poverty Line,

UE = Per cent Unemployment to the Labor Force,

FL = Female Literacy,

URB = Per cent Urban Area, and

AAM = Female Mean Age at marriage

The correlation matrix reconfirms that the female age at marriage is closely associated with the agro-climatic factors. Three out of four agro-climatic factors considered here, have a significant correlation. Rainfall has the highest positive correlation with the female age at marriage followed by land productivity and forest area. This means that higher rainfall, higher land productivity and higher percentage of forest area, are associated with higher levels of female age at marriage. These findings are consistent with the patterns observed above. It is interesting to note that land availability has an inverse relationship with female age at marriage. This could be due to

at least two reasons: (i) that higher per capita land availability is associated with lower productivity of land, as indicated by the strong negative correlation between land availability (CL) and land productivity (LP) and (ii) that the regions with lower per capita cultivable land are expected to have more non-agricultural activities.

As documented by most other studies, this analysis also shows that female literacy has the highest positive correlation with female age at marriage. Poverty level also seems to have an almost equally strong relationship. The relationship between unemployment and female age at marriage is relatively less significant. Surprisingly, urbanization does not show any

significant association with female age at marriage. What is more important to note here is that not only female age at marriage but some other socio-economic variables also have close association with the agro-climatic variables. For example, female literacy has a significant correlation with all the agro-climatic factors except forest area, level of unemployment shows a high correlation with land productivity etc.

Further, in trying to explain the variability in the level of female age at marriage across the agro-climatic regions, a series of multiple regression analyses was carried out. Before briefly reporting the results from these multivariate analyses, we would like to caution that the validity of these results is limited by the fact that they are based on the aggregate level areal data and that they are based on only 15 units. These results must, therefore, simply be treated as indicators of possible relationships which might be verified in future studies with better data sources.

In the first set, four agro-climatic variables viz., Forest Area, Land Availability, Land Productivity and Rainfall, were taken as predictor variables. These four variables, in combination, explained around 46 per cent variation in the level of female age at marriage. In the second set, important socio-economic variables viz., poverty, Unemployment, Female Literacy and Urbanization, were used as predictors. They explained a much higher proportion of variability (around 77 per cent). Both socio-economic and agro-climatic variables combined together in the third set, explained around 81 per cent variability in the female age at marriage.

It is obvious that agricultural and climatic conditions are the basic resources for any population and they affect both social and economic behavior of the people. But the actual mechanism is probably much more complex. With increasing education levels, occupational opportunities, income levels, and changing technology and infrastructure, the natural factors seem to be losing their grip on female age at marriage. For example, the rainfall may not be an

important factor for people of an area which has good ground water management or land availability may not make much sense unless considered along with productivity of land. It is, therefore, important to see the relationship between age at marriage and agro-climatic conditions in the light of technological infrastructural, and other socio-economic development of a region or sub-region because these developmental aspects seem to reduce the effects of agro-climatic factors on age at marriage and other social factors.

### **Concluding Remarks and Areas of Future Research**

The importance of female age at marriage is now well recognized, particularly in the field of health and family welfare. In the recent past it has claimed to have played a considerable role in reducing fertility and thereby the pace of population growth in many developing countries. A number of attempts have so far been made to understand the dynamics of this important social variable. In this study, an attempt has been made to discuss the differentials in the female age at marriage with respect to agricultural and climatic conditions in India. The district level data on female mean age at marriage from the 1981 census and the 15 major agro-climatic resource regions delineated by the Planning Commission, Government of India, have formed the basis for this study.

The study shows that there is a very clear regional pattern in the level of female age at marriage, with respect to agricultural and climatic conditions in India. The female age at marriage varies widely across the agro-climatic zones. The Himalayan regions and the coastal areas typically have higher age at marriage than most of the hinterland regions. Amongst the important agro-climatic factors, rainfall, altitude, temperature, forest area, land availability and land productivity are found to be associated with mean age at marriage of females, in general. As there are significant intra-regional variations in the



agro-climatic conditions, the female age at marriage also varies significantly within each region. This intra-regional variability in female marriage age is observed to be negatively associated with the homogeneity of regions with respect to agricultural and climatic conditions. This means that the regions with higher sub-regional agro-climatic diversities, have higher intra-regional variability in the female marriage age.

The rural areas are found to be more sensitive to the agro-climatic conditions in comparison to urban areas. It is true that urban areas have much higher female age at marriage than rural areas but this regional pattern according to agro-climatic conditions does not seem to be due to the urban bias. At least in the case of coastal regions, one may be inclined to believe that higher age at marriage is due to more urban concentration (mainly port cities), but even for rural areas in these regions the pattern remains the same. The study also indicates that urban areas tend to reduce this regional variability in the female age at marriage.

Other socio-economic variables also indicate a very significant association with the female age at marriage, but at the same time they are closely associated with agro-climatic conditions of the region. It is hypothesized that with changing socio-economic, technological and infrastructural conditions, the effect of historically more important agricultural and climatic variables on female age at marriage is declining. This hypothesis could not be empirically tested in this paper due to the lack of needed information. However, the study provides a strong indication for this hypothesis to be true.

Agro-climatic factors are primary forces affecting female age at marriage through several intermediate socio-economic variables. A more appropriate way of analyzing the effects of agro-climatic factors on female age at marriage would be to carry out path analysis over a period of time in history.

Before concluding the discussion, the following points which are important, both for this study and for future research, must be taken into consideration. (i) The above analysis of agro-climatic factors, is in no way exhaustive and complete and the results discussed hold true in general only. Contradictions and exceptions to any or all the stated results may be found in some pockets of the country; (ii) It would be interesting to study the relationship between age at marriage and agro-climatic factors in history. And to test the hypothesis of changing relationship, as stated above, between age at marriage and agro-climatic factors over time, due to socio-economic, technological and infrastructural development; (iii) Another important hypothesis regarding the directionality of relationship between female age at marriage and some important socio-economic variables like education, occupation, etc. needs to be tested; (iv) More micro-level forces like beauty, behaviour, dowry, etc. need to be considered for any meaningful explanation of female marriage pattern and behaviour; (v) In addition to the above, the role of some important factors like media, law, etc.; in affecting the female age at marriage, needs to be incorporated in the future research. This paper, therefore, leaves many questions to be answered and many hypotheses to be tested by future studies. And concludes with a note that female age at marriage needs to be studied in a much broader perspective.

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**APPENDIX - I****Classification of Districts According to Major Agro-Climatic Zones as per 1981 Census Boundaries**

Agro-Climatic Region/State	Districts
<b>I. Western Himalayan Region</b>	
Uttar Pradesh :	Uttar Kashi, Chamoli, Tehri Garhwal, Dehradun, Garhwal, Pithoragarh, Almorad, Nainital
Himachal Pradesh :	Chamba, Kangra, Hamirpur, Una, Bilaspur, Mandi, Kulu, Lahaul & Spiti, Shimla, Solan, Sirmaur, Kinnaur
Jammu & Kashmir :	Anantnag, Pulwama, Srinagar, Badgam, Baramula, Kupwara, Kargil, Leh, Doda, Udhampur, Kathua, Jammu, Rajouri, Punch
<b>II. Eastern Himalayan Region</b>	
Assam :	Golpara, Kamrup, Darang, Nowgang, Sibsagar, Lakhimpur, Mikir Hills, North Cachar Hills, Cachar, Dibrugarh
Manipur :	Manipur North, Manipur South, Manipur East, Manipur West, Manipur Central, Tengenoupal
Meghalaya :	Jaintia Hills, East Khasi Hills, West Khasi Hills, East Garo Hills, West Garo Hills
Arunachal Pradesh :	East Kameng, West Kameng, Lower Subansiri, Upper Subansiri, East Siang, West Siang, Dibang Valley, Lohit, Tirap
Nagaland :	Kohima, Phok, Wokha, Zunheboto, Mokokchung, Tuensang, Mon
Tripura :	West Tripura, North Tripura, South Tripura
West Bengal :	Koch Bihar, Jalpaiguri, Darjiling
Mizoram :	Aizwal, Lunglei, Chhimituipui
Sikkim :	East Sikkim, West Sikkim, North Sikkim, South Sikkim
<b>III. Lower Gangetic Plains Region</b>	
West Bengal :	West Dinajpur, Maldah, Murshidabad, Nadia, 24-Parganas, Calcutta, Howrah, Hugli, Medinipur, Bankura, Bardhaman, Birbhum
<b>IV. Middle Gangetic Plains Region</b>	
Bihar :	Patna, Nalanda, Nawada, Gaya, Aurangabad, Rohtas, Bhojpur, Saran, Siwan, Gopalganj, Paschim Champaran, Purab Champaran, Sitamarhi, Mujaffarpur, Vaishali, Begusarai, Samastipur, Darbhanga, Madhubani, Saharsa, Purnia, Katihar, Munger, Bhagalpur,
Uttar Pradesh :	Bahraich, Gonda, Faizabad, Basti, Gorakhpur, Deoria, Azamgarh, Jaunpur, Ballia, Ghazipur, Varanasi, Mirzapur
<b>V. Upper Gangetic Plains Region</b>	
Uttar Pradesh :	Saharanpur, Muzaffarnagar, Bijnor, Meerut, Ghaziabad, Bulandshahar, Muradabad, Rampur, Badaun, Bareilly, Pilibhit, Shahjahanpur, Aligarh, Mathura, Agra, Etah, Mainpuri, Farrukhabad, Etawah, Kanpur, Fatehpur, Allahabad, Kheri, Sitapur, Hardoi, Unnao, Lucknow, Rae Bareli, Barabanki, Sultanpur, Pratapgarh

**VI Trans Gangetic Plains Region**

Delhi :	Delhi
Punjab :	Gurdaspur, Amritsar, Firozpur, Ludhiana, Jalandhar, Kapurthala, Hoshiarpur, Rupnagar, Patiala, Sangrur, Bhatinda, Faridkot
Haryana :	Ambala, Kurukshetra, Karnal, Jind, Sonapat, Rohtak, Faridabad, Gurgaon, Mahendragarh, Bhiwani, Hisar, Sirsa
Chandigarh :	Chandigarh
Rajasthan :	Ganganagar

**VII. Eastern Plateau and Hills Region**

Bihar :	Santhal Pargana, Dhanbad, Giridih, Hazaribag, Palamu, Ranchi, Singhbhum
Madhya Pradesh :	Sehdol, Balaghat, Surguja, Bilaspur, Raigarh, Rajnandgaon, Durg, Raipur, Bastar
Maharashtra :	Bhandara, Chandrapur
Orissa :	Balangir, Dhenkanal, Kendujhar, Kalahandi, Koraput, Mayurbhanj, Phulbani, Sambalpur, Sundargarh
West Bengal :	Purulia

**VIII. Central Plateau and Hills Region**

Uttar Pradesh :	Jalaun, Jhansi, Lalitpur, Hamirpur, Banda
Madhya Pradesh :	Murena, Bhind, Gwalior, Datia, Shivpuri, Guna, Tikamgarh, Chhatarpur, Panna, Sagar, Damoh, Satna, Rewa, Sidhi, Vidisha, Bhopal, Sehore, Raisen, Betul, Hoshangabad, Jabalpur, Narsimhpur, Mandla, Chhindwara, Seoni
Rajasthan :	Alwar, Ajmer, Bharatpur, Bhilwara, Banswara, Bundi, Chittorgarh, Dungarpur, Jaipur, Kota, Pali, Sawai, Madhopur, Sirohi, Tonk, Udaipur

**IX. Western plateau and Hills Region**

Maharashtra :	Nasik, Dhule, Jalgaon, Ahmadnagar, Pune, Satara, Sangli, Solapur, Kolhapur, Aurangabad, Parbhani, Bid, Nanded, Osmanabad, Bhuldana, Akola, Amaravati, Yavatmal, Wardha, Nagpur
Madhya Pradesh :	Mandsaur, Ratlam, Ujjain, Shajapur, Dewas, Jhabua, Dhar, Indore, West Nimar, East Nimar, Rajgarh
Rajasthan :	Jhalawar

**X. Southern Plateau and Hills Region**

Andhra Pradesh :	Chittoor, Cuddapah, Anantpur, Kurnool, Mahbubnagar, Rangareddi, Hyderabad, Medak, Nizamabad, Adilabad, Karimnagar, Warangal, Khammam, Nalgonda
Tamil Nadu :	Dharamपुरi, Salem, Periyar, Coimbatore, Madurai, Tiruchchirapalli
Karnataka :	Bangalore, Belgaum, Bellary, Bidar, Bijapur, Chitradurga, Dharwad, Gulbarga, Hassan, Kolar, Mandya, Mysore, Raichur, Tumkur

**XI. East Coast Plains and Hills Region**

Orissa :	Baleshwar, Cuttack, Ganjam, Puri
Andhra Pradesh :	Srikakulam, Vijaynagaram, Vishakapatnam, East Godavari, West Godavari, Krishna, Guntur, Prakasam, Nellore,
Tamil Nadu :	Madras, Chengalpattu, North Arcot, South Arcot, Thanjavur, Pudukottai, Ramnathpuram, Tirumelveli
Pondicherry :	Pondicherry, Karaikal, Mahe, Yanam

**XII. West Coast Plains and Ghats Region**

Tamil Nadu :	Nilgiri Kanyakumari
Kerala :	Cannanore, Waynad, Kozhikod, Malappuram, Palghat, Trichur, Ernakulam, Idukki, Kottayam, Alleppey, Quilon, Trivandram
Karnataka :	Chikmanglore, Dakshin, Kannad, Kodagu, Shimoga, Uttar Kannad
Maharashtra :	Greater Bombay, Thane, Raigarh, Ratnagiri
Goa, Daman & Diu :	Goa, Daman, Diu
Dadra & Nagar haveli :	Dadra & Nagar Haveli

**XIII. Gujarat Plains and Hills Region**

Gujarat :	Jamnagar, Rajkot, Surendranagar, Bhavnagar, Amreli, Junagarh, Kuchch, Banaskantha, Sabarkantha, Mahesana, Gandhinagar, Ahmadabad, Kheda, Panch, Mahals, Vadodara, Bharuch, Surat, Valsad, The Dangs
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**XIV. Western Dry Region**

Rajasthan :	Bikaner, Barmer, Churu, Jhunjhunun, Jaisalmer, Jodhpur, Jalore, Nagaur, Sikar
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**XV. Islands Region**

Andaman & Nikobar Is.:	Andmans, Nikobars
Lakshdweep	Lakshdweep

**APPENDIX-II (A)**  
**Typological Characteristics of Agro-Climatic Regions**

S.N. Region(s)	Characteristics
1. The Himalayan Regions (1&2)	Less favorable land and water resources, low land productivity, low pressure on land and fragile eco-system
2. Lower and middle Gangetic Plains (3 & 4)	Rich water and soil resource, low productivity level, high population pressure on land, increasing proportion of problem soils.
3. Upper Gangetic Plains (5)	Rich soil and water resources, medium productivity level and moderate population pressure on land, deteriorating environment with respect to land quality
4. Trans Gangetic Plains (6)	Rich water and soil resources, high land productivity moderate population pressure on land
5. Eastern and Central Plateau and Hills (7 & 8)	Large volumes of land and water resources, very low productivity of land with pre-dominance of subsistence agriculture, low population pressure, high proportion of problem soils
6. Western and Southern Plateau and Hills (8 & 9)	Less favorable soil and water resources, low land productivity, low to medium population pressure, deteriorating environment in respect to soil erosion and water quality
7. East Coast and West Coast Plains & Hills and Islands (11 & 12 & 15)	Rich water resources but relatively poor land, medium land productivity, medium to high population pressure fragile eco-system
8. Gujarat Plains and Hills (13)	Semi-arid to arid conditions, moderately good land quality and land productivity, moderate population pressure on land
9. Western Dry Region* (14)	Arid conditions, large but less fertile soil resources, very low land productivity, low population pressure, fragile eco-system

*Source* : Planning Commission, Government of India, 1989.

**APPENDIX-II (B)**  
**Some Important Characteristics of Agro-climatic Regions**

Sl. No.	Agro-Climatic Regions	Popn. Density (/sqkm)	Forest Area (%)	Cult. Land (P)	Land Prod. (/Ha)	Rain Fall (mm)
1.	W Himalaya	62	45.3	.195	3516	1198
2.	E Himalaya	118	42.8	.189	3411	2574
3.	L Gangetic	692	11.0	.098	4743	1486
4.	M Gangetic	526	8.7	.141	3043	1134
5.	U Gangetic	466	4.5	.172	5125	900
6.	T Gangetic	331	3.2	.268	4672	604
7.	E Plateau	136	35.2	.323	2528	1342
8.	C Plateau	137	14.2	.446	2089	856
9.	W Plateau	170	11.8	.396	2202	876
10.	S Plateau	200	17.1	.319	3388	813
11.	E Coast	321	18.7	.181	5480	1057
12.	W Coast	441	29.0	.123	5453	2664
13.	Gujarat	175	10.9	.363	3010	836
14.	W Dry	58	1.2	1.314	659	395
15.	Island	29	88.1	.210	5892	3086



Sl. No	Agro-Climatic Regions	Poverty (%)	Unempl. (%)	Literacy % Female	Urban (%)
1.	W Himalaya	20.4	0.96	23.1	16.36
2.	E Himalaya	30.1	2.36	27.2	12.34
3.	L Gangetic	39.0	4.06	31.8	28.43
4.	M Gangetic	49.0	1.10	12.2	9.73
5.	U Gangetic	41.4	1.10	15.1	21.64
6.	T Gangetic	17.8	2.50	32.1	21.65
7.	E Plateau	49.8	0.67	15.6	16.23
8.	C Plateau	45.5	0.75	14.2	21.73
9.	W Plateau	41.3	1.12	27.4	25.74
10.	S Plateau	38.2	1.63	23.6	27.84
11.	E Coast	38.1	2.61	30.3	26.14
12.	W Coast	24.4	5.41	56.2	34.36
13.	Gujarat	27.9	1.56	32.7	31.10
14.	W Dry	32.8	1.20	9.6	21.92
15.	Islands	28.2	1.10	39.1	29.81

- Sources :*
1. Planning Commission, Government of India, 1989.
  2. Census of India, 1981.

## DEMOGRAPHIC PROCESSES OF URBANISATION IN DELHI

ASHOK DIWAKAR    AND    M.H. QURESHI  
GURGAON, INDIA                      DELHI, INDIA

Metropolitanisation has been observed by experts as one of the main characteristics of Indian Urbanisation. Rural to urban migration has been a major player in urban growth of metropolitan cities particularly Delhi. Not only Delhi but its hinterland is also urbanising fast as compared to the hinterlands of other major cities of India. There are several processes of urbanisation viz. historical, physical, demographic and economic. In this paper the role of demographic processes in urban expansion of Delhi has been encapsulated.

In the pre-British period, Delhi was important only as a political and cultural centre. There was little commercial or industrial development. The population of Delhi at that time consisted mostly of the courtiers, the nobles and the army of the King (Bopegamage, 1957). Francois Bernier, the noted French traveller who toured through the Mughal empire in the later half of the 17th century, commented thus on the condition of the city, "The whole population of Delhi is in fact collected in the camp, because deriving its employment and maintenance from the court and army, it has no alternative but to follow the Kings in their march" (Bernier).

There was no proper census of the population of the city taken before the British the period. The figures for those periods were worked out on the exaggerated descriptions given by different travellers, who visited Delhi time and again. The population figures of Delhi prior to 1881 given by different sources reflect discrepancy. For instance, Prabha Chopra (1975) mentions that the population of Delhi stood at 2

millions in Aurangzeb's time, 0.5 million after the attack of Nadirshah or even 0.1 million in the early years of 18th century. Von Orlich, a German traveller who visited Delhi in 1843 gives the population as 0.2 million, Hindus more than three times the number of Muslims (Chopra, 1975). According to Bopegamage (1957) when Delhi passed into British hands in 1803, its population at that time was estimated to be about 1,50,000. During the next 45 years there was a very slow growth in its population. In 1847 the population of the city along with its suburbs was 1,60,279 showing an increase of about 6.5 per cent. According to Hamilton (1971) the population of Delhi in 1820 A.D. was 1,50,000. It was in the later half of the 19th century when first census of 1881 provided the reliable figure of population of Delhi as 1,73,000. This population increased to 1,93,000 by 1891 (Rao and Desai, 1965). But these figures were not comparable for the Delhi territory for all the 10 censuses, because administrative changes have caused this unit to vary from census to census.

It will be seen from Table 1 that the population of Delhi has always witnessed an increase since the turn of the century. The decade ending 1911 indicates a slow growth which was to some extent due to the presence of hundreds of persons who had come from the provinces to make preparations for the Imperial Darbar. On the other hand, an epidemic of plague during this decade was responsible for many deaths. The year 1911 was an important land-mark in the history of Delhi, when it was made the capital of India with seat of power at Delhi. The urban population increased by 0.24 lakhs in this decade but in the next decade nearly 0.71 lakh persons were added to it. This was the result of improved industrial and commercial conditions. The pull exerted by the new city was very strong. In the subsequent decades of 1931 and 1941, considerable growth of population was recorded when nearly 3.91 lakh persons were added to urban population between 1921 and 1941. From 1921 onwards as the city regained its importance politically, commercially and industrially, more and more immigrants flooded in. During the decade ending in 1931, the population marked a gradual increase of 47 per cent, 48 per cent of the total population being immigrants.

The phenomenal growth of population took place only in the decade of 1941-51. The urban population of Delhi grew from 6.95 lakhs in 1941 to 14.37 lakhs in 1951 - a growth of 106 per cent. The reason for this increase was the influx of nearly 4.5 lakhs of Hindu and Sikh refugees from West Pakistan in 1947. However, about 3.29 lakh Muslims moved out of Delhi during the same period. So the net increase in refugee population was about 1.35 lakhs. Also, this was a period of improvement in sanitation and health conditions which brought down the mean decennial death rate in 1951 to less than half of what it was in 1931. During the same period rural-urban migration also continued at a considerable rate and total increase in the population of Delhi was nearly 7.41 lakhs during the decade ending in 1951. In the next two decades Delhi again experienced a sharp increase in its urban

population which increased from 23.59 lakhs in 1961 to 36.47 lakhs in 1971. The census of 1981 also indicates the sharp increase in urban population which rose from 36.47 lakhs in 1971 to 57.68 lakhs in 1981, an increase of 58.16 per cent.

### **Growth of Urban Population in Delhi**

The proportional share of Urban population in Delhi increased from 51.39 per cent in 1951 to 92.73 per cent in 1981. Despite the First Master Plan's (1961-81) overt policy to restrain the city's population growth, Delhi has maintained its lead in the rate of population growth among the four largest cities of India. The proportional increase in population of 58 per cent during 1971-81 where this growth rate was 38, 35 and 31 per cent for Greater Bombay, Madras UA and Calcutta respectively. If percentage growth of population in metropolitan cities is analysed over the years, Delhi convincingly shows its mammoth growth. (Table 2).

### **Variation in Urban and Rural Population During 80 Years**

Table 1 reveals impressive variations in population from census to census. During the first decade of 20th century the percentage variations in urban population were less impressive as the increase was nearly 11.6 per cent between 1901-11. During this period rural population declines by 8.2 per cent. This can be attributed to large number of deaths caused by epidemics. There was substantial increase in urban population during 1921-31 and 1931-41 decades, recording the decadal variations of nearly 47 per cent and 55 per cent respectively. The growth rate of rural population during 1931-41 was also very significant. This was due to shifting of capital to Delhi and development in trade and industry in the Union Territory. The decennial percentage variations in 1941-51 were high both in rural and urban population because of refugee migration in 1947. The net increase in the urban population continued even during the next two decades. The decrease in rural population during 1951-61 can

be attributed to the incorporation of 48 villages in the urban boundary. Moreover, the growth rate of population also remained low. The phenomenal increase in rural population in 1961-71 suggests the concentration of rural as well as urban population on the periphery of the city. In 1981 the urban population further increased by 58.1 per cent while the growth rate of rural population declined to 8 per cent only. During this decade 27 more villages were incorporated in the urban agglomeration (Table 3). In spite of the fact that the number of inhabited rural villages is decreasing in every decade, rural population is increasing. This suggests that periphery of the city pulls population from urban as well as remote rural areas.

In each decade number of villages are incorporated in urban Delhi. Upto 1981, 162 villages have been urbanised. A day is not far off when the whole of Delhi will be urbanised.

### Level of Urbanisation

Until 1911, Delhi was a regional town. The respective censuses of 1881, 1891 and 1901 reveal that the growth rate of urban and rural population in Delhi was almost equal.

The change of capital from Calcutta to Delhi in 1911 accelerated the growth of urban Delhi. During the last seven decades from 1911 to 1981, the increase in urban population and the decrease in rural population has been very marked i.e. the level of urbanization increasing from 51 per cent to 93 per cent and the rural population decreasing from 44 per cent to 7 per cent.

### Migration

Delhi, being an important centre of trade, industry, commerce and administration, has always attracted job seekers. Immigration has contributed a high percentage to the growth of city population. Out of the total population of 62.2 lakhs about 26 lakh were migrants in 1981 census as against 14.60 lakh migrants in 1971. Out of them 12.6 lakhs have come from rural areas and 13.5 lakhs have come from urban areas.

On the average 1.8 lakh people came to Delhi from other states of India.

Table 6 shows that the percentage of migrants to population had fallen during 1981 as compared to the previous decade. The rate of growth of migrants has become almost half of 1971. It has become less than the growth rate of population in Delhi in 1981. Delhi's population has increased slowly during 1961-81, yet it is almost double the all India population growth rate of 2.25 per cent. The higher rate of growth of population than the rate of growth of migration may be attributed to declaration of 27 villages as census towns in 1981. Another explanation may be the decline in death rate in Delhi\* because the average longevity in Delhi is higher than the all India average. But in absolute terms, the volume of migration has increased from 19 lakh to 26 lakh between 1971 and 1981.

### Migration From Other States

During 1971-81, 12.3 lakh persons entered Delhi as migrants from other states and Union Territories of India. Out of these migrants more than half (50.1 per cent) were from Uttar Pradesh. Table 7 shows that 83 per cent of the inmigrants who came to Delhi during the last decade were from four states of Uttar Pradesh, Punjab, Haryana and Rajasthan.

### Rural and Urban Migration

Of the total migrants from other states during 1971-81, 5.95 lakhs (57 per cent) had come into Delhi from the rural areas and 5.28 lakhs (43 per cent) had come from urban areas. The proportion of migrants with rural origin was higher in case of Uttar Pradesh, Haryana, Rajasthan and Bihar. The proportion of migrants of urban origin was much more in the case of Punjab, which can be explained in terms of their level of development.

### Migration from the neighbouring Districts

Due to developed means of transportation, districts around Delhi interact more with the city than the settlements away from them as is evident from Table 9.

**TABLE-1**  
**Growth of Total, Urban and Rural Population in Delhi**  
**(1901-1991)**

Year	Total		Men		Women		Urban		Rural		Decadal Variation		Urban Ratio	
	No.	%	No.	%	No.	%	Men	Women	Men	Women	Men	Women		Urban Ratio
1901	405819		217921		187898		114815	93760	208575		103106	94138	197244	1/1.1
1911	413851	+ 2.0	230865	+ 5.9	182986	+ 2.6	133864	98773	232837	+ 11.6	97001	84103	181014	1/1.3
1921	488452	+18.0	281777	+22.0	206675	+12.9	182054	122366	304420	+30.7	99723	84309	184032	1/1.7
1931	636246	+30.3	369497	+31.1	266749	+29.0	267979	179463	447442	+46.9	1 01518	87286	188804	1/2.4
1941	927939	+44.3	535236	+44.8	382703	+43.4	414821	280865	695686	+55.4	120415	101838	222253	1/3.1
1951	1744072	+90.0	986538	+84.3	757534	+97.9	817432	617702	1437134	+106.5	167106	139832	306938	1/4.7
1961	2658612	+52.4	1489378	+50.9	1169234	+54.3	1327386	1032022	2359408	+64.1	161992	137212	299204	1/7.8
1971	4065698	+52.9	2257515	+51.5	1808183	+54.6	2028091	1618932	3647023	+54.5	229424	189251	418675	1/8.7
1981	6220406	+53.0	3440081	+52.3	2780325	+53.7	3190248	2577952	5768200	+58.1	249833	202373	452206	1/12.7
1991	9370475	+50.6	5120733	+67.2	4249742	+65.4	-	-	-	-	-	-	-	-

Source : Census of India, 1981 & 1991.

Provisional.

**TABLE 2**  
**Population Growth in Metropolitan Cities/Urban Agglomerations : 1901-81**

Metropolitan City	% Growth of Population of 1981 over 1901	Rank
1. Calcutta	517.7	10
2. Greater Bombay	914.1	5
3. Delhi	2594.0	1
4. Madras	621.6	8
5. Bangalore	1737.0	2
6. Ahmedabad	1270.7	3
7. Hyderabad	467.7	11
8. Pune	927.4	4
9. Kanpur	708.2	6
10. Nagpur	681.4	7
11. Jaipur	533.8	9
12. Lucknow	293.2	12

Source : The Times of India, *Directory & Yearbook*, 1984, p. 265.

**TABLE 3**  
**Inhabited villages in Union Territory of Delhi : 1921 - 81**

Year	1921	1931	1941	1951	1961	1971	1981
No. of Inhabited Villages	314	307	305	304	276	243	214

Source : Census of India, 1961, 1971 & 1981.

**TABLE 4**  
**Growth Rate of Urban and Rural Population Before 1911**

Census Year	% of Urban Population	% of Rural Population	Annual Growth Rate of Urban Population
1881	49	51	1.1
1891	52	48	1.1
1901	51	49	0.8

Source : Census of India, quoted from *Gazetteer of Delhi, op.cit.*

**TABLE 5**  
**Rates of In migration in Delhi** (Figures in Lakh)

1961-66	1966-70	1970-71	1961-71	1971-76	1976-80	1971-81
0.61*	0.94	1.32	<b>0.81</b>	0.93	1.62	<b>1.29</b>

Source : Census of India, 1961, 1971 & 1981.

\* Figures indicate to annual average rate of inmigration

**TABLE 6**  
**Migrants to Delhi by Place of Last Residence**

Sl. No.	1951	1961	1971	1981
1. No. of Migrants	542,982	971,725	1908,732	2663,184
2. Total Population	1744,072	2658,612	4065,698	6220,406
3. %age of Migrants	31.13	36.55	46.94	42.81
4. Annual Growth Rate of Migration		5.99	6.98	3.38
5. Annual Growth Rate of Population		4.30	4.33	4.34

Source : Census of India, 1961, 1971 & 1981.

### Purpose of Migration

'Adverse economic conditions\* are the greatest single cause of migration to cities in India. The pitiable rural poverty characterised by low productivity, unemployment and under-employment, low income level, low levels of consumption may push people out to the cities and towns where there are better economic opportunities. Higher wages for labour and potentiality of employment are the major attractions which set the process of migration. The main causes of migration are unemployment and family movement.

Table 11 shows that maximum percentage of male migrants is for employment. The percentage of urban males and females is less than rural males and females coming for employment in Delhi. More than 81 per cent of female migrants from rural as well as urban areas have come to Delhi either due to marriage or family movement.

The analysis of their level of literacy reveals that roughly two thirds of males and three fourths of females who have come to Delhi for employment were illiterate or were below matric.

**TABLE 7**  
**Flow of Migrants into Delhi**

State	Before 1961 (%)	1961-71 (%)	1971-81 (%)	Period not Known to Migrants	Total %
Haryana	22.1	16.4	12.9	-	15.5
Madhya Pradesh	1.2	1.7	3.1	-	2.4
Punjab	16.8	11.3	6.4	-	9.8
Rajasthan	7.5	7.6	7.6	-	7.6
U.P.	41.7	49.6	50.1	-	48.2
Other Excluding Outside India	10.6	13.4	19.9	-	16.5
<b>Total</b>	<b>19.4</b>	<b>22.8</b>	<b>53.5</b>	<b>4.3</b>	<b>100.00</b>

Source : Census of India, 1961, 1971 & 1981.

\* In 1989 death rate in Delhi was : Combined 6.7. Rural 7.7 and Urban 6.6 whereas these figures for India were 10.2, 11.1 and 7.1 respectively.

\* This is the observation of sample Survey Report on nine Indian cities - Baroda, Hubli, Hyderabad, Secunderabad, Jam Shedpur, Kanpur, Poona, Gorakhpur, Lucknow and Surat.

**TABLE 8**  
**Share of Other States in Rural and Urban Migration to Delhi : 1981**

States	Share in Rural Migration (%)	Share in Urban Migration (%)
Uttar Pradesh	57.0	42.0
Haryana	14.0	11.5
Rajasthan	9.0	6.0
Bihar	7.0	4.0
Punjab	3.7	10.0
Other States	9.3	26.5
Total	100	100

Source : Census of India, 1981.

**TABLE 9**  
**Migrants Contributed by Neighbouring States : 1980-81**

State	Districts with % of Migrants to Delhi.
Haryana	Rohtak (3.74), Sonapat (2.16), Gurgaon (2.16), Karnal (1.13)
Punjab	Amritsar (2.29), Jalandhar (1.70), Ludhiana (1.45), Hoshiarpur (1.13)
Uttar Pradesh	Meerut (8.83), Bulandshahr (6.68), Aligarh (5.69), Agra (2.67) Ghaziabad (2.59), Garhwal (2.30), Muzaffar Nagar (1.70), Almora (1.70) Mathura (1.49), Muradabad (1.43), Kanpur (1.41), Etah (1.29) Saharanpur (1.29), Lucknow (1.25),
Rajasthan	Jaipur (2.08) Alwar (1.11)

Source : Socio-Economic Unit, PPW DDA (1990), New Delhi.

\*Figures in Parentheses indicate percentage.

### Pull Factors for Migration in Delhi

Living conditions and economic opportunities act as attractive forces for job seekers and comparatively less rewarded labourers. The pressure of population, which results in higher man-land ratio, has been hypothesised as one of the major causes of increased poverty and rural outmigration (Gosal and Krishan, 1975). It will be of interest if the contribution of various states to migrants in Delhi is analysed. It is generally maintained that poor states send more migrants to Delhi. Table below reveals that this generalisation is not true. Two Union Territories of Delhi and Goa, Daman & Diu and one state of Punjab fall in the high level

of per capita income group while in medium category are three states of Haryana, Maharashtra and Gujarat and one U.T. of Pondicherry. Rest of the states and U.T.s come in the lower group.

Per capita income of Uttar Pradesh is in lower category (Rs. 2146 for 1986-87) but 50 per cent of the total migrants in Delhi come from Uttar Pradesh. In this category there are other states with much less per capita income than Uttar Pradesh i.e. Bihar (Rs.1802), Orissa (Rs. 1957) and Madhya Pradesh (Rs. 2020) and which are distantly located. These distantly located and relatively poor states send fewer number of migrants comparatively. In medium category, Gujarat and Maharashtra together send only 5 per



**TABLE 10**  
**Migrants to Delhi from Different States on the Basis of Purpose : 1981**

State	Employment (Lakhs)	Family Movement (Lakhs)
Haryana	0.36	0.60
Madhya Pradesh	0.14	0.01
Punjab	0.16	0.36
Rajasthan	0.32	0.40
Uttar Pradesh	2.31	2.37

Source: Census of India, 1981.

cent of migrants whereas 14 per cent migrants come from Haryana which has second highest per capita income among states after Punjab. Punjab and Rajasthan stand third and fourth in percentage of migrants, whereas among states Punjab has first place in per capita income and Rajasthan is less than half of that of Punjab but the difference in their share in migrants is

negligible.

The analysis reveals that it is not always poverty of the state which induces migration, the factor of distance is also determining. Big cities create sphere of influence where gradients of migrants become less sharp with distance away from the centre successively.

**TABLE 11**  
**Delhi : Percentage of Migrants on the Basis of Purpose : 1971-81**

Purpose	Total		Rural		Urban	
	Males	Females	Males	Females	Males	Females
Employment	55.8	6.8	60.5	7.4	48.4	5.9
Family Movement	29.3	52.6	26.5	53.8	34.0	51.3
Marriage	-	28.6	-	27.4	-	30.1
Education	4.1	2.3	3.8	2.1	4.5	2.6
Others	10.8	9.7	9.2	9.3	13.1	10.1
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Census of India, 1981.

**TABLE 12**  
**Level of Literacy of Migrants Coming for Employment in Delhi : 1981**

	Total		Rural		Urban	
	Males	Females	Males	Females	Males	Females
Illiterates and Below Matric	6.0	76.0	70.0	90.0	24.0	40.0

Source: Census of India, 1981.

\* Figures are in percentage

**TABLE 13**  
**Share in Migration to Delhi and per Capita Income of States**

Per Capita Income (1986-87) Group (Rs.)	Level of Income	Number of** States / U.T.s	Percentage of Migrants to Delhi (1971-81)
Below 3000	Low	14	73.59
3001-4000	Medium	4	16.88
Above 4000	High	3	9.53

Source : Rural Gazetteer of Delhi, *op.cit.*

\* Delhi is also included among these.

\*\* Figures of income for Tripuram Meghalaya, Mizoram, Arunachal Pradesh, Sikkim, Nagaland are not available for 1986-87.

### Sex Ratio

The sex composition of a region generally affects the socio-economic and ethnic problems of a society to a greater or lesser degree. Delhi's sex ratio to its male population has had a number of fluctuations since 1901. There was a downward trend in the sex ratio during the decades of 1911-21, 1921-31 and 1931-41. Though Delhi could not reach the mark of 1901 till now, yet the sex ratio has been steadily increasing since 1941. The higher sex ratio in the rural areas may be explained by the fact that a large number of men flock to urban Delhi in search of employment, leaving their families in the villages.

### The Density of Population

The density of population of the Delhi territory claimed as one of the highest densities in the world, has been on the increase since 1911. The rural density had been steadily increasing throughout the period except for the decade ending 1911, when it fell due to an epidemic of plague. The urban density also rose steadily until 1911, showed a marked decline in 1921 but recovered gradually. The reason for this fluctuation is that during 1911-21, the city of New Delhi came into existence with a large area and sparse population. The same was true of the new cantonment. The impact of refugee migration is evident from the urban density figure of 1951. The decade 1951-61 witnessed a very small increase in the urban density. This was due to the fact that the urban area increased from 199 sq.kms. to 326 sq.kms. It may be pointed out that

in 1981, the density of population of urban Delhi was about 20 times more than that of rural Delhi.

### Conclusions

In the pre-British period Delhi was a small regional town where there was little commercial or industrial development, though it was an important political and cultural centre. Lack of proper census nurtured wide variety of estimates of population of Delhi. The year 1911 was an important landmark in the history of Delhi when it was made capital of India. From 1921 onwards as the city regained its importance politically, commercially and industrially more and more immigrants flooded in. Phenomenal growth of population took place only after 1947 when large influx of refugees from Pakistan changed the demographic scenario of Delhi. Immigration has contributed a high percentage to the growth of city's population. Due to developed means of transportation, districts around Delhi interact more with the city. 'Adverse economic conditions' are the greater single cause of migration. The purpose of maximum percentage of male migrants is employment. More than 81 per cent of the female migrants from rural as well as urban areas came to Delhi is due to either marriage or family movement. It is generally maintained that poor states send more migrants to Delhi but this generalisation is not true. It is not always poverty of the state which induces migration, the factor of distance also has its own role to play.

**Table 14**  
**Delhi : Change in Sex Ratio in Rural and Urban Areas 1901-91**

Year	1991	1981	1971	1961	1951	1941	1931	1921	1911	1901
Total	830	808	801	785	768	715	722	733	793	862
Rural	-	810	825	847	837	845	860	845	869	916
Urban	-	808	798	777	754	677	670	672	740	817

Source: Census of India, 1961, 1971, 1981 & 1991

**TABLE 15**  
**Density of Population in Delhi**

Year	1881	1891	1901	1911	1921	1931	1941	1951	1961	1971	1981	1991
Density /Km	192	191	271	245	326	429	613	1174	1791	2738	4194	6319

Source : Census of India, 1961, 1971, 1981 & 1991.

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# HOUSING AND HEALTH IN VARANASI URBAN AGGLOMERATION

SEEMA RAI  
VARANASI, INDIA

The three basic objectives of the study are (i) understanding the existing housing conditions in the city of Varanasi, (ii) analysing the health conditions of its populace, and (iii) correlating the health conditions with the quality of housing, accessibility to services, energy use and industrial pollution.

It has been established that the status of human health expressed in terms of quality of life is dependent upon environmental conditions, socio-cultural and economic set up of the area. Human resource development can be accelerated through improvement of housing conditions and public utility services. This paper examines the housing conditions and health status in Varanasi urban agglomeration.

## Introduction

Intimate relationship can be observed between the ingredients of good health of the population and the indicators of the level of socio-political and economic development of the countries on the global scale. As Mountjoy (1971) has said - "Perhaps more than anything else it is the human factor that is most under developed, and it is upon improvement in the quality and condition of the human factor that in the first instance other material development depends".

The conventional dichotomy between welfare programmes and productive investments lose its meaning in Third World Countries. Improving the living conditions of the poor, expanding their skills, raising their levels of educational attainment, improving their health and raising their income must be viewed as long range investments in human resource

development and capital formation, not as welfare programmes. Substantial evidence supports the argument that human resource development is the most effective means of alleviating poverty in developing countries and of increasing the production and income of the poor (Adelman, Morris and Robinson, 1976). Both direct and indirect investments are needed to strengthen the economics of urban centres and, in the long run, they seem to be mutually reinforcing (Singh and Singh, 1991):

The Third World Countries are faced with dual problem of population increase with built-in-demographic momentum and deterioration in the quality of the life and hence of human resource. Both the problems are inexorably interlinked. A rapidly increasing population makes the management of available resources quite difficult and simultaneously results in inequal access to and/or lack of productive resources. Ill health and

illiteracy do not allow any improvement plan to succeed. Thus poverty begets poverty. Ill health causes loss of daily wages and hence malnutrition. These increase the incidence of mortality and provide a basis to rationalise frequent births and high rate of fertility. In addition, the societies in the Third World are considerably complex and conservative, making the process of development and transformation still more difficult. There is urgent need to improve the quality of life while maintaining the environment too. Neither can be risked.

Housing is a highly visible dimension of poverty and an important indicator of environmental quality and human welfare. In terms of physical quality, service provision and household density, housing condition along with level of nutrition is an important determinant of human health. Access to clean and sufficient water, adequate sanitation and proper sewerage can go a long way in breaking the tight transmission cycle upon which a high prevalence of several diseases depends. Thus, housing seems to have a significant impact on health and hence on community development and the resultant socio-economic situation.

Poor housing may increase the incidence of diseases and may aggravate their severity. This may bring on poor general nutrition and may further hamper body's resistance to various disease agents.

Therefore, poor housing along with nutritional deficiency is one of the most important factors contributing to perpetual poverty and ultimately hinders the process of development. H.W. Singer describes these problems as "Vicious circles within vicious circles and of interlocking vicious circles." (Fig. 1)

The vicious circle of underdevelopment consisting of low productivity, low real income, low level of demand, low saving, low investment, capital deficiency, underdeveloped resources (including human), poor infrastructure, and small market has a tendency to perpetuate and become more entrenched in a developing economy. This downward spiral is likely to undermine all

development efforts (Nurkse, 1953). However, poverty does not cover all aspects of disadvantages. A cluster of five disadvantages namely - poverty, physical weakness, isolation, vulnerability and powerlessness interlock like a web to trap people in their deprivation. Poverty is a strong determinant of other clusters of disadvantages (Chambers, 1983).

The thesis that poor accept their poverty as inevitable owes much to the Lewis's concept of a 'culture of poverty'. The concept denotes a situation in which people are trapped in a social environment characterized by apathy, fatalism, lack of aspirations, exclusive concern with immediate gratifications and frequent endorsement of delinquent behaviour. There poverty and other disadvantages get manifest in the condition of housing size, structure, security and services in a community.

Like most of the Third World Countries, India is also facing the dual problem of population growth and poverty. The two together have made the quality of life, standards of living, nutrition and housing conditions deteriorate. Rapid population growth and continuously increasing influx of population, especially from rural areas into the cities, creates serious problems for the municipal bodies to cope with. Large number of people have to be fed, clothed and housed along with job provision and health care. This accommodation is actually a sort of adjustment on the finite resource-land. Multi-storey buildings, small rooms, common toilets, public taps, wells and hand pumps, *sulabh*-complexes are simply ways by which the municipal bodies are trying to solve part of their housing problems. But all this inevitably lowers the standard of living, creates environmental problems due to over-crowding, excessive construction, inadequate services and over-strained facilities. All this together affects the health of the people - young and old, alike.

World Health Organization (WHO) has defined health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 1978).

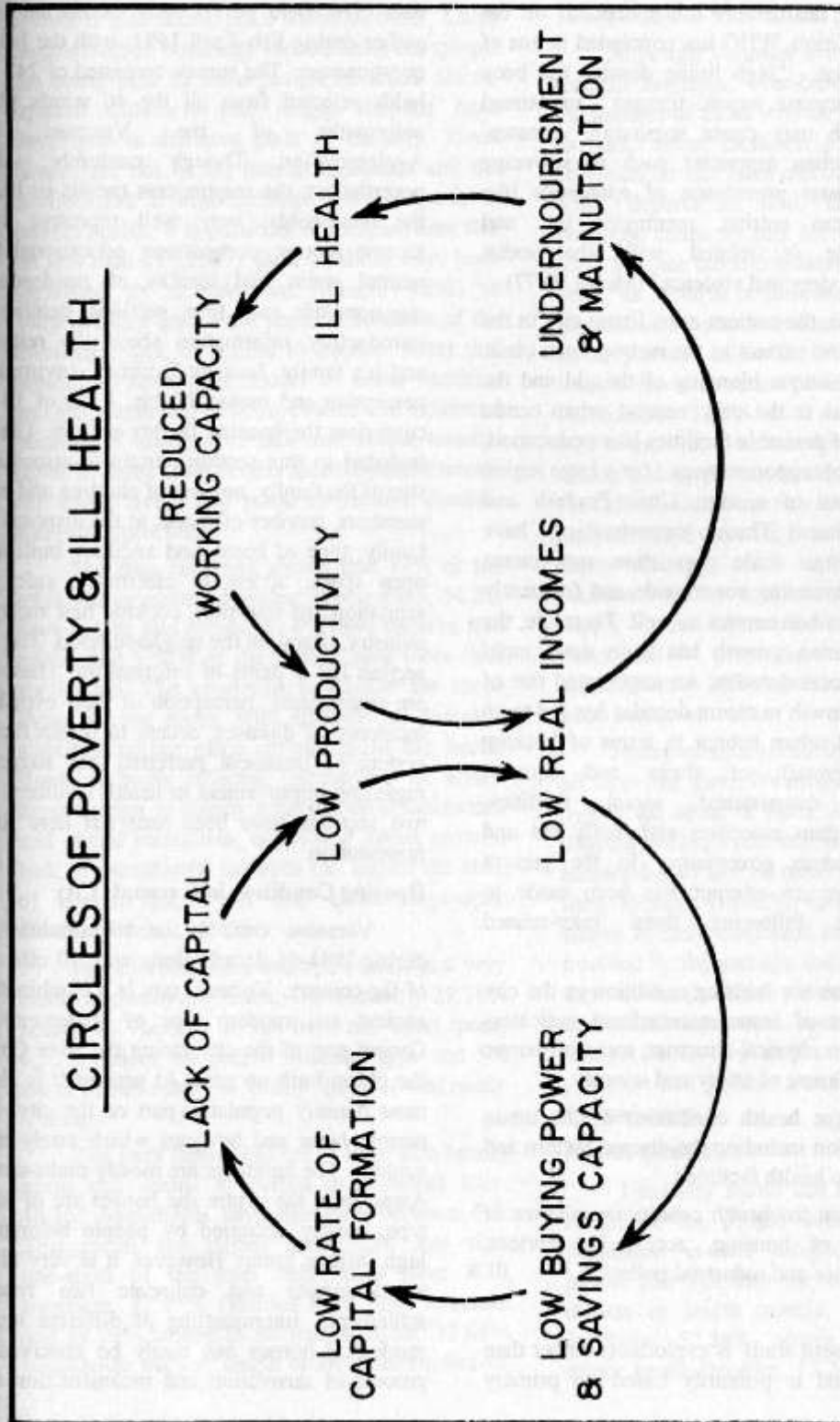


Figure-1

This state of health very much depends on the housing condition. WHO has concluded in one of its reports that - "high living density has been found to increase mental tension ; unplanned urban growth may cause respiratory diseases; inadequate urban amenities such as sewerage toilet etc. cause prevalence of epidemics like cholera, gastro enteritis, meningitis etc. and over-crowding is related with the social alienation, anxiety and violence" (Mehta, 1977).

Varanasi, the ancient most living city in the world, is a new entrant to the metropolitan class. It presents a unique blending of the old and the new. Varanasi is the only nearest urban centre with plenty of desirable facilities like - education, health care, job opportunity etc. for a large region covering parts of eastern Uttar Pradesh and western Bihar. These opportunities have stimulated large scale population movements from the surrounding countryside and frequently from smaller urban centres as well. Therefore, the urban population growth has been more rapid during the recent decades. An accelerated rate of population growth in recent decades has led to an impoverished urban habitat in terms of housing shortages, growth of slums and squatter settlements, overstrained social facilities, inadequate urban amenities and inefficient and ineffective urban governance. In the present research paper an attempt has been made to achieve the following three inter-related objectives :

- (a) to discuss the housing condition in the city in terms of some standardized indicators related to physical structure, socio-economic role, measure of safety and security.
- (b) to analyse health conditions of the urban population including the disease pattern and access to health facilities.
- (c) to explain the health conditions in terms of quality of housing, access to services, energy use and industrial pollution.

### **The Data**

The present study is exploratory rather than conclusive and is primarily based on primary

data. The field survey was conducted by the author during Feb-April 1991, with the help of a questionnaire. The survey consisted of 245 house holds selected from all the 40 wards plus 10 outgrowths of the Varanasi Urban Agglomeration. Though randomly selected, nevertheless, the respondents (adults or heads of the households) very well represent various income groups, occupations, educational levels, marital status and locality of residence. The questionnaire had four sections dealing with introductory information about the respondent and his family, housing facilities, environmental perception and human health. A set of 13 items comprises the housing facility section. The items included in this section pertain to structure and size of the family, number of children and earning members, number of rooms at the disposal of the family, type of house and ancillary built-up and open space, access to electricity, safe water, sanitation and sewerage, cooking fuel and type of industry, if any, in the neighbourhood. The health section has 8 items of information. These items are respondents' perception of their own health, incidence of diseases, access to health facilities, system of treatment preferred and suggestions regarding improvement in health facilities. These two sections have been analysed here for this presentation.

### **Housing Condition in Varanasi City**

Varanasi entered the metropolitan class during 1981-91 decade along with 10 other cities of the country. Varanasi city is a combination of ancient and modern type of settlements. The Central part of the city facing the river Ganga is the oldest built up area. At present it is also the most densely populated part of the city. It has narrow lanes and by-lanes which rarely receive sunrays. The buildings are mostly multi-storeyed. Away from the centre the houses are of modern type, mostly occupied by people belonging to high income group. However, it is very difficult to demarcate and delineate two types of settlements. Intermingling of different types of residential houses can easily be observed. The process of renovation and reconstruction of old

houses is also taking place simultaneously. Large multi-storeyed buildings and building complexes are being built in some peripheral areas. Slums, squatter settlements and 'Jhuggi- Jhoparis' have developed in different parts of the city. These houses are not fit for human habitation and the environment in these localities is not congenial to human health. It is pertinent to mention here that no less than 115(1987) slum localities have been identified by a researcher (Singh, 1990) in Varanasi City area. Poor physical structure of the dwellings, lack of access to potable water and sanitation, inadequate access to social facilities and a constant fear of being evicted and bulldozed because of absence of safe and secure tenurial rights in some cases render these localities unsafe for man's living and prone to various diseases and health problems.

The data collected shows that 17% of the total houses surveyed consist of one room, 54.2% have one to two rooms, 20.4% have three to five rooms and 6.53% of the houses have more than six rooms. The condition is terrible for those living in one room, with all sorts of domestic activities taking place in one room the health status is badly affected. According to WHO, hypertension is closely related with urbanization; and social vandalism, unplanned urban growth, lack of recreational facilities etc. impair the state of human health and may cause respiratory diseases (Mehta, 1977).

Proper ventilation and open space is a very essential part of any house. Unfortunately 29.38% houses in Varanasi do not have any open space. 6.12% houses are purely 'Kachha' type and 5% are of mixed nature i.e. partly 'Kachha' and partly 'Pucca'.

The joint family system or large size family norm still seems to persist in Varanasi City. 48.167 households have members between 5-7. This forms the largest group. No less than one-sixth of the total households have 8-10 members. 42.85% families have joint structure and 49.79% belong to nuclear structure. 12.65% households occupy single room accommodation,

34.69% have 2-3 rooms and 32% have 4-6 rooms.

Although Varanasi is a million city with all modern facilities, over-crowding has increased the number of those who do not have easy access to basic urban facilities. 6.53% of the houses surveyed do not have electricity. 45.30% households depend on coal, kerosene, wood and cowdung cakes as fuel for cooking their meals. Very few use electric heaters for this purpose. As many as 57.06% households cook their food on gas stoves. About three-fourth of the total houses have private toilet facility whereas 15.51% houses have common toilets shared by many households. 3.26% use sulabh-complexes and 5.30% are left with no option but to use open drains and open low lands around their locality for defecation. About two third of the total houses are connected to sewer lines, 28.81% houses have septic tanks. As much as 74.28% families have exclusive access to their own source of water supply - either tap, well or hand pump; but still a substantial proportion of population, approximately 25% depends on public water taps, hand pumps or wells.

Plenty of small scale industries are scattered all over the city. Weaving, assembling, bakery, dyeing are some of them. About one-fifth of the total respondents feel excess of noise around their houses due to one or more of these industries in their locality; 11.02% feel suffocation due to smoke in their residential locality, and 7.75% are troubled by the garbage and filth in the locality of their residence. Milch animals are kept within the residential areas and some times roam about freely. These are a source of environmental pollution and present a traffic hazard during the day and night.

#### **Health Condition**

The study shows that in general the state of health of the people according to their own perception is not satisfactory. Only 26.12% people feel that they are not suffering from any disease or health trouble, and are fit to work regularly; 52.24% people are suffering from minor health troubles, 12.24% require more rest



after little work and 8.57% cannot work due to ill health.

When asked whether they have suffered from any major disease during last five years, 57.14% responses were in affirmative. Regarding availability of health facilities 62.04% people find them adequate, 26% perceive them as inadequate, 9.38% find the facilities too expensive, and 6.12% find the health facilities adequate but expensive. More than three-fourth (77.55%) of the population prefers allopathic treatment. This may partly be attributed to the fact that most of the practitioners belong to this system of treatment and the quick relief helps them to perceive the beneficial effect.

Distance wise 52.24% people have hospital facilities in close proximity, 25.71% have dispensaries near their houses or places of residence, 12.24% are near to nursing homes. But 2.04% of the population does not have any of these within a convenient distance.

### Housing and Health

When the housing facilities were co-related

with the health status (Table -1), it was found that 80.3% of the population totally depending on public taps, wells or hand pumps for domestic water supply are suffering from one or the other disease. This percentage is considerably low among those who have private source(s) - it is 70.8%. Where 28% of the people having private source(s) feel that they have no health trouble, only 20% people depending for water supply on public source(s) can claim the same. Among those who have suffered from some major disease during the last five years, the percentage is higher of those who depend on public water source(s) - it is 65.5% against 54.3% for those who have private water source(s).

The response of those in the category of open space users for defecation needs a little detailed analysis. When the two categories - one who use toilets and the other who use open drains or open space, are compared. It is found that the percentage of population in no health trouble category is higher among the open space users, but in the category of those who cannot work due to ill health and who have suffered serious major diseases in the last five years the percentage of

**Table 1**

	Health Problem		Disease In Last 5 Yrs			
	No (%)	Yes (%)	Yes (%)	No (%)		
<b>Water Supply</b>						
Public	20	80.3	65.5	29.5		
Private	28	70.8	54.3	43.9		
<b>Fuel Used</b>						
Gas	26.9	71.5	53.0	43.6		
Others	25.2	74.7	61.2	36.0		
<b>Open Space</b>						
Yes	31.2	67.6	54.3	43.3		
No	13.8	86.1	63.8	31.9		
	No health problem	Minor problem	Can not work due to ill health	Little work more rest required	Disease in last 5 years	
					yes	no
<b>Toilet Facility</b>	25.6%	52.3%	8.22%	12.5%	56.7%	40.2%
<b>Open Space and Drains</b>	30.7%	46.1%	15.3%	7.69%	61.5%	38.4%

those using open space is high. To be more specific the figure is almost double than those who have the facility of proper toilets. These two contrasting facts prove their state of health and also people's perception regarding health and environment. Most of those in this category are illiterates living in slums.

A comparative study of the L.P. gas users and those using coal, wood, kerosene etc. as fuel for cooking purpose, shows that the percentage of population using gas stoves is more in the category of no health trouble. As much as 61.2% non-gas users have suffered from major diseases during the last five years. The corresponding percentage figure for gas users is 53.

No less than 30% houses in Varanasi city are deprived of any open space. A comparative analysis of the availability of open space and the health status of the occupants reveals that 31.1% of the population living in houses with open space feels no health problem whereas the corresponding figure is 13.8% for those who are living in houses without open space. In the category of those suffering from any major or minor health problem the percentage of those living in properly ventilated houses is low by 18.5%. Also among those who have suffered from any major disease during last five years the percentage of people living in houses with no open space is relatively much higher.

### **Concluding Remarks**

A consensus seems to emerge that the status of human health is the most important ingredient of the quality of life and the latter very much depends on the condition of the environment defined in terms of physico-biotic resources, culturo-natural processes and the socio-economic milieu. Home and work environment is the most important determinant of human health and housing is the most important of the former. Housing does not refer to the physical structure of the dwelling alone but it has a much wider connotation. It also refers to the household activities, energy use for domestic purposes and access to some very essential social facilities. The present analysis confirms the premise that the condition of housing and the status of human health are very

much interlinked. It is generally believed that 'housing' is the most visible expression of one's wealth and income level and it is very often, forgotten that poor or, for that matter 'bad' housing and lack of access to some essential community facilities may perpetuate poverty and may strengthen the trap of deprivation and process of marginalisation of the resident population.

There is need to emphasize human resource development through improvement in housing condition and public utility system. Proper housing, safe water and adequate sanitation may go a long way in improving the health of the population and the resultant distribution of human welfare. Preventive measures are rather more important than the curative measures in a Third World metropolitan environment. Site improvement, slum clearance and self help may play a major role in improving the condition of housing and in augmenting the urban facilities more so when municipal bodies lack resources to finance these development programmes. Land use controls and zoning regulations may be made more effectively in order to avoid public nuisance in residential areas and to foster a congenial environment for urban population.

According to provision population totals of 1991 census the total population of Varanasi urban area is 10,26,467 and it has increased by 28.47% during 1981-91 against a growth of 22.45% during 1971-81. The rate of population growth in Varanasi during the last decade has been almost equal to that of Kanpur (28.81) and less than half of that of Lucknow (62.97). If this trend continues, which is quite possible in the present circumstances, there is likely to be more pressure on existing housing stock and urban amenities. Again, if mass construction and haphazard urban growth continue in order to accommodate the increased number of people there are little chances of any improvement in the health condition of the people of Varanasi. Nevertheless, many diseases have been brought under control by special extra efforts, like mass immunization programme. However, long term success of such programmes very much depends on the rate of growth of population and level of living conditions.

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# SPATIAL PATTERN OF MIGRATION OF PLANTATION LABOUR AND ITS DYNAMICS

B.N. SHIVALINGAPPA AND P.D.MAHADEV

MYSORE, INDIA

This study examines the issue of migrational trends being witnessed by areas of plantation agriculture. The focus is on the linkages between structural changes in local economies, the overall development policy and peoples responses to plantation agriculture both as an economic activity and as a way of life. Based on field data, it is a case study of Hassan district, Karnataka.

## Introduction

One of the greatest problems in the development of plantation areas is the non-availability of local labour. This is true not of India alone but the world over. It gives rise to in-migration of labour to the plantation areas. However, the pattern, size and direction of the migration stream of the incoming labour keep changing through time for a number of reasons; the structural changes in the local economies of the areas from where the migration streams originate, the changing government policy of development, perception and attitude of the people towards plantation work, and the changes that take place in the plantation areas themselves. The paper attempts to bring out the pattern of migration of labour force and its changing characteristics in the western ghats.

## The Study Area

The area selected for the purpose is Manjarabad taluk in Hassan district of Karnataka. This taluk is dominated by plantation economy

and has been receiving migrants, both permanent and seasonal from the surrounding dry and backward areas since the introduction of plantation crops in the beginning of this century. However, the volume, pattern and direction of the migration streams has been undergoing radical changes and at present the migrations that are witnessed by the estates are mainly of a seasonal nature.

Manjarabad taluk has gradually transformed itself from a subsistence economy into a capitalistic economy with the introduction of plantation crops in the beginning of this century. It has started attracting labour force from outside to cope with the increased employment opportunities. Thus, the development of plantations acted as a pull factor creating a centripetal force in this area.

We have selected ten estates representing different geographical locations, sizes and different periods of establishment. Among these

estates, nine are coffee plantations and the remaining one is the tea estate.

Most of these estates were established by the British before Independence. However, most of the present owners are from Dakshina Kannada district of Karnataka and Tamil Nadu<sup>1</sup>. Six of these tea estates are smaller than five hundred acres each, three are bigger than 1000 acres each<sup>2</sup>.

The labour force in the estates could be classified into two categories : permanent workers and seasonal workers. Permanent and seasonal workers are mainly from outside whereas casual workers are normally from the villages adjoining the estates.

#### Permanent yet Mobile Workers

Permanent workers are those who usually reside in the quarters built by the estate owners and do all kinds of work in the estates through the year. In the nine coffee estates that we have surveyed there were a total of 215 permanent workers in 1989-90 (seven estates in fact for the other two estates are still in their early stages of development and do not have permanent workers in the true sense of the word). All these workers come from outside the Ghats, mainly from Dakshina Kannada and Kerala, a few from Tamil

Nadu (Fig- 1).

These in-migrants and in some cases their parents had moved to this area long time back (in some cases two or three generations ago) and have been working in various estates. In most cases, workers from Dakshina Kannada keep moving from one estate to the other estate (Fig- 2) after completing the stipulated period of time in order to qualify for the benefits enunciated by the Plantation Labour Act, particularly the provident fund, gratuity etc. Any worker having worked permanently for a period of at least five years in an estate can claim this fund. But if he claims it and then remains in the same estate, he will be considered as a monthly paid permanent worker being paid higher wages. Although some workers choose to stay back as permanent workers, yet most of them decide to encash the provident fund after five years or so. Once they do it, they prefer to leave and start work afresh in a new estate as a permanent, rather than stay back in the old one as casual workers.

This process, resulting from a need for ready cash explains as to why these "permanent" workers can appropriately - even if paradoxically be called as "mobile population".

By contrast, those permanent workers who

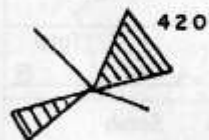
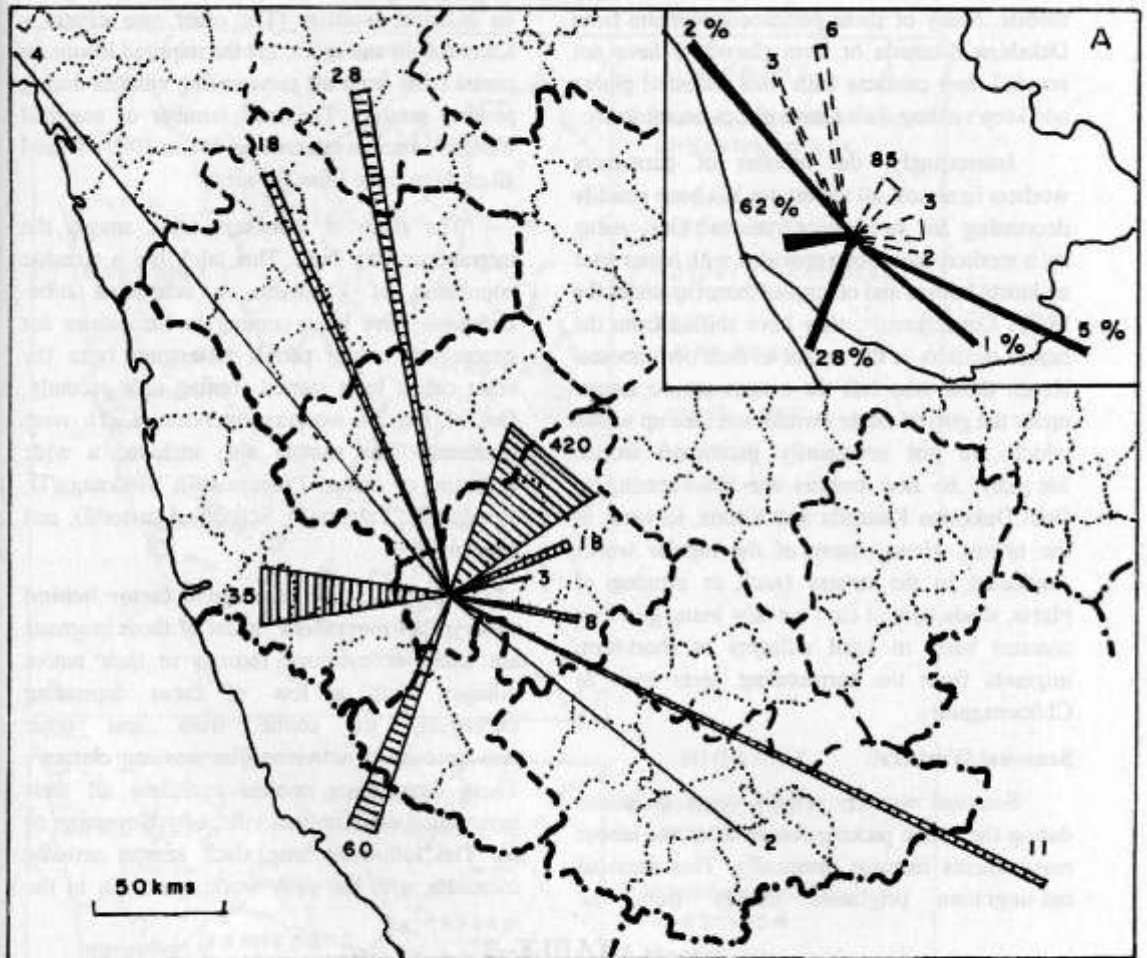
**TABLE- 1**  
**Origin of Permanent Workers in Nine Coffee Estates**

Place of origin	Dakshina Kannada	Kerala	Tamil Nadu	Hassan district and other parts of Karnataka	Total
Number of workers	135	60	11	9	215

Source : Field Survey, 1990.

1. Out of the 10 estates 2 were established between 1840 and 1865; 3 between 1870 and 1900; 2 (including the tea plantation) between 1900 and 1947, 1 between 1960-85 and 2 after 1985. On the whole, 7 have been established by the British and 3 by Indians, after Independence. Of the present owners of these estates 5 are from Dakshina Kannada, 3 from Tamil Nadu, 1 from Coorg, 1 from Chikamagalur and just 1 from Manjarabad taluk.
2. More than 1000 acres 3 estates; 500 to 1000 acres, 1, 100 to 500 acres, 5; less than 100 acres 1;

## ORIGIN AREAS OF PERMANENT AND SEASONAL WORKERS IN COFFEE ESTATES



Number and place of Origin of permanent and Seasonal migrants working in the plantation

Percentage of permanent migrants who have come from this area

Percentage of seasonal migrants coming from this area

Figure-1

came only one of two decades ago and who came from other parts of Karnataka, including other taluks of Hassan district itself are relatively less mobile. Many of these permanent workers from Dakshina Kannada or from elsewhere have not severed their contacts with their ancestral places and keep visiting their native places occasionally.

Interestingly, the number of permanent workers in almost all the estates has been steadily decreasing for two major reasons. One, many such workers have been provided with house sites or Janata houses and other such benefits under the IRDP. Consequently, they have shifted from the labour quarters of the estates to their own houses. Hence those who left the estates are no longer under the grip of estate owners and take up works which are not necessarily plantation works. Secondly, no new comers are now coming in from Dakshina Kannada and Kerala, to work in the estates. Hence many of the regular works conducted in the estates (such as pruning of plants, shade control etc.) are now being given on contract basis to local villagers or short-term migrants from the surrounding areas such as Chikamagalur.

### Seasonal Workers

Seasonal workers usually come to estates during the coffee picking season when the labour requirements increase drastically. This seasonal out-migration originates mainly from the

backward and dry regions which is a common experience all over the country (Patel, 1987). In the present case, out of nine estates, seven depend on seasonal workers (The other two estates - Kumbrahalli and Igoor, get the required labour on casual basis from the surrounding villages during picking season). The total number of seasonal workers in seven estates was 492 in 1989-90<sup>3</sup> and all of them came from dry areas.

The share of Arasikere taluk among the migrants is very high. This taluk has a sizeable population of Lambanis, a scheduled tribe. Lambanis have been coming to the estates for generations, while people belonging from the other castes have started coming only recently. Out of the 34 workers interviewed, 21 were Lambanis. The sample also included a wide spectrum of castes: Lingayats(6); Vokkaliga(1); Kurubas(2); Talvara(1); Scheduled castes(2); and Muslim(1).

**Poverty is the main push factor behind this 'type' of movement** : most of these migrants are small or marginal farmers in their native villages, with a few of them depending exclusively on coolie work and other non-agricultural activities like washing clothes<sup>4</sup>. These farmers or coolies complete all their agricultural work in their village by November or so. The following long slack season actually coincides with the peak working season in the

**TABLE- 2**  
**Place of Origin of Seasonal Workers**

District of Origin	District Hassan	Dharwad District	Shimoga District	Total		
Taluk of origin	Arasikere	Hasan	H.Narasipur	Byadgi	Sorab	
Number of workers	420	18	9	28	18	492

3. This figure, however, is not constant for the entire season as it keeps fluctuating.

4. Occupation of seasonal migrants at their native place, cultivation 10, cultivation and coolie work 14, coolie work 8, non-agricultural work 2.

**MOBILITY PATTERNS OF THE HOUSEHOLD OF PERMANENT WORKERS IN COFFEE ESTATES TWO EXAMPLES FROM AGALATTI ESTATE**

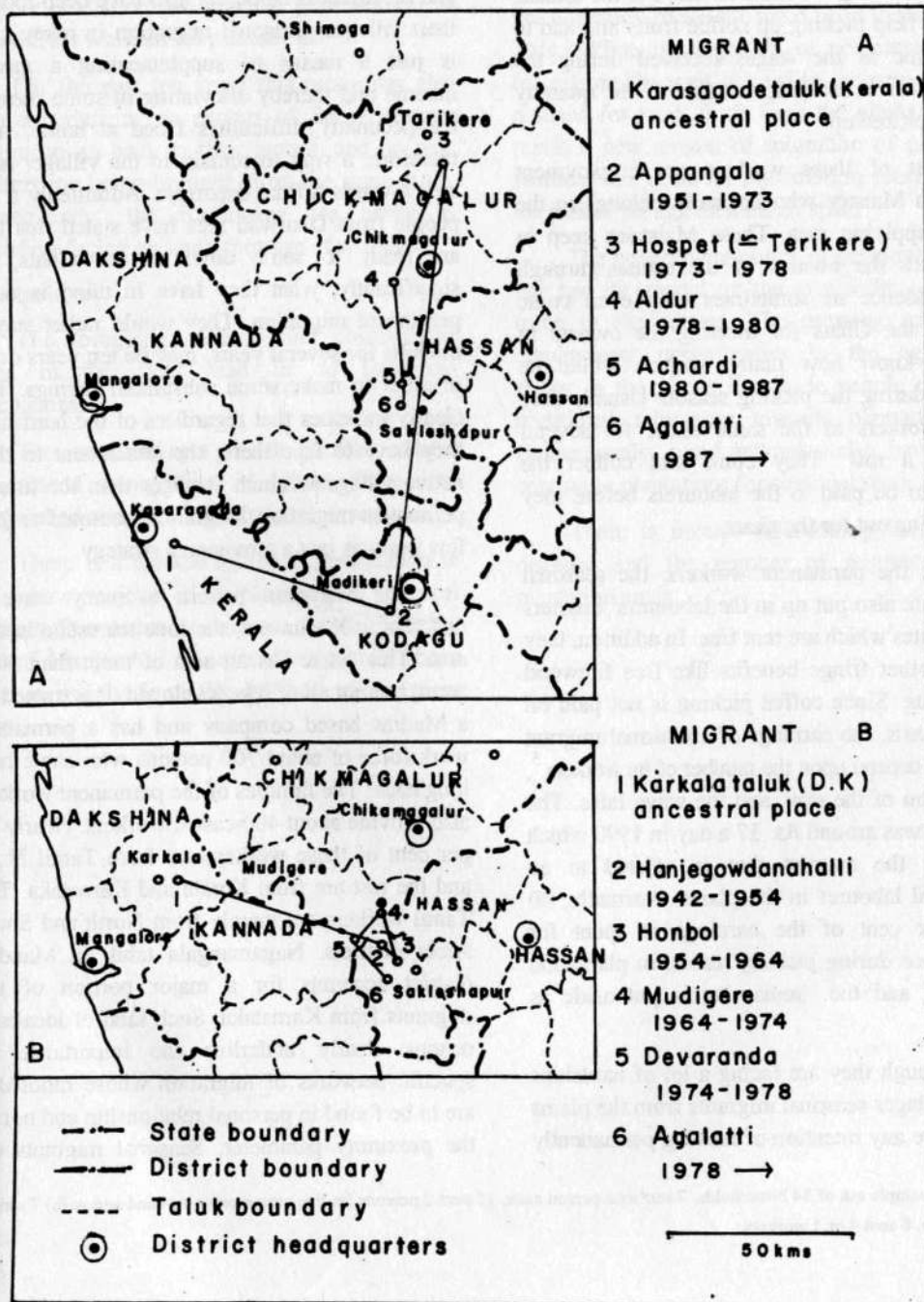


Figure-2



estates. In most cases, these seasonal workers leave their children and other dependents at home. But sometimes all the members of the family, including the children move to the estates. Children help picking up coffee fruits and add to the income as the wages received during the picking season are proportionate to the quantity of fruits picked up.

Most of these workers get employment through a Maistry who normally belongs to the labour supplying area. These Maistries keep in touch with the owners of the estates through correspondence or sometimes they even come down to the Ghats for meeting the owners in order to know how many workers would be required during the picking season. Usually they supply workers to the same estate for several years in a row. They come and collect the advance to be paid to the labourers before they start moving out for the ghats.

Like the permanent workers, the seasonal workers are also put up in the labourers' quarters in the estates which are rent free. In addition, they also get other fringe benefits like free firewood for cooking. Since coffee picking is not paid on contract basis, the earnings of a seasonal migrant household depend upon the number of its workers<sup>5</sup>, the duration of the stay, and the wage rates. The wage rate was around Rs. 17 a day in 1990 which is double the amount that is offered to an agricultural labourer in the plains. Normally, 40 to 60 per cent of the earnings is spent for maintenance during picking season in plantation area itself and the remaining is put aside as savings.

Although they are facing a lot of hardships in their villages seasonal migrants from the plains do not have any intention of moving permanently

to the plantation area for they have certain reservations. The small and marginal farmers with some land would, of course, hold on to it and the landless labourers also have deep roots in their villages. Seasonal migration in many cases is just a means of supplementing a meagre income and thereby alleviating in some measure the pecuniary difficulties faced at home. It is, therefore, a way to remain in the village, not a step towards a final departure. Admittedly a few people from Dharwad area have stated that they are ready to settle down in the Ghats, but significantly, what they have in mind is not a permanent migration. They would rather stay in the hills for several years, may be ten years or so, in order to make some substantial savings. This clearly indicates that regardless of the hardships, they have to face there, the attachment to their native village is much stronger than the lure of permanent migration. Migration, seasonal or for a few years, is just a provisional strategy.

The migration pattern in many ways is different at Kadumane, the lone tea estate in this area. This estate has an area of more than 5000 acres, but not all of it is developed. It is owned by a Madras based company and has a permanent work force of about 700 persons who came here long back. The families of the permanent workers also provide about 400 casual workers. Nearly 80 per cent of these workers are from Tamil Nadu and the rest are from Kerala and Karnataka. The Tamil workers are mainly from North and South Arcot districts. Nagamangala taluk in Mandya district accounts for a major portion of the migrants from Karnataka. Such kind of localised origins clearly underline the importance of specific networks of migration whose rationales are to be found in personal relationship and not in the proximity parameter. Seasonal migrants do

5. In our sample out of 34 households, 7 sent one person each, 15 sent 2 persons (in this case mostly husband and wife) 7 sent 3 persons, 6 sent 4 or 5 workers.

not come to this estate, since the processing of tea in the estate involves continuous work throughout the year. Unlike coffee picking, prior training is essential for work on tea plantations.

For the past ten years this estate has also been experiencing an exodus of Tamil workers longing to go back to their homes, and no new workers are being brought in on the same scale. Consequently, the Kadumana tea estate is nowadays facing an acute shortage of workers.

### Conclusions

The forgoing analysis and observations made in the field lead us to following conclusions:

The establishment of the coffee estates necessitated immigration of labour force into Manjarabad area from the surrounding regions.

There is a marked spatial differentiation in the source regions of permanent and seasonal workers. Permanent workers are mostly from the west of Manjarabad whereas the seasonal labour force is mainly from the dry belt of the plain areas.

The structural changes that have taken place in Dakshina Kanadda/Kerala areas have arrested the migration of labour force from these regions. This decline in migration of permanent labour force from the west has led to an increase in the demand for work force from the plains and as a result a new stream of migration of permanent workers has been set into motion recently from the plains, though on a minor scale.

The government policy of development also has had its impact on the availability of labour force in the estates. The growing scarcity of employment opportunities in the agricultural sector in the plains has made people overcome traditional reluctance towards plantation jobs. Consequently, non-Lambanics also have started coming to plantations for seasonal work.

There is inverse relationship between the distance and the number of migrants to the plantation areas.

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# INCOME DISTRIBUTION IN RURAL SAGAR

RAMAKANT BOHARE AND D.S. SHRIVASTAVA  
SAGAR, INDIA

The present study is based on socio-economic data obtained from eight villages of the district, representing different family-income levels. The factors which seem to influence family incomes include occupational structure, distance from nearby urban centers and general accessibility. While selecting sample villages their geographical location, facilities for education, agricultural innovations etc. were also considered.

The inter-village income dissimilarities have been observed in the district. The rural settlements under urban influence or with proper accessibility have a greater percentage of high-income families. The major source of income for over a third of the rural families of the district, is as agricultural labour, while the another third earns its living by other agricultural work and the rest are either petty businessmen or are engaged in services. The majority of the people have not been able to prosper, because they are not able to find year-round employment.

Income distribution in developing countries has distinct spatial perspective as it varies widely between rural and urban areas. Studies on rural income distribution invariably highlight incidence of poverty, in the rural areas. In India, the problem of poverty it appears, is concerned not merely with low level of income but also with a high degree of inequality in the income even at the lowest level (Reddappa, 1984, 40).

The study makes an attempt to identify the pattern of household income distribution in rural areas, based on the socio-economic surveys in Sagar district. The analysis is restricted to the data collected through personal interviews of the rural sample households distributed all over the district.

Sagar district with an area of 10,252 sq. kms. lies in the north-central part of Madhya Pradesh. According to the 1991 census, it had a

rural population of 11,65,105. The growth rate of rural population was recorded as 22.06 per cent which is higher than both the state average (22.11) and the national average (19.7.).

For the present study eight villages were selected keeping in view the geographical setting, accessibility, educational facilities, distance from urban places and roads, agricultural techniques etc. These villages provide good geographical representation of the socio-economic characteristics of the entire district.

## Size of the Family and Earning Members

The level of income is affected by the size of the family and also by the number of persons engaged in gainful occupations. The happiness of the family as a whole is largely dependent on the total number of persons employed and the number of dependents. It is generally believed that greater number of earning members in a

**TABLE - 1**  
**Sagar district : Average Size of Families and Their Earning Members**

Name of village	Per family	
	Members	Earning members
Patharia Jat	7.08	3.04
Hiranchhipa	7.45	2.75
Bandri Karoti	4.72	2.24
Mundra Jaruakhera	5.85	2.74
Semra Ramchandra	5.70	2.66
Navalpur	8.57	5.09
Kherana	5.76	2.26
Katangi	6.30	2.82
<b>AVERAGE</b>	<b>6.35</b>	<b>2.80</b>

*Source* : Based on sample surveys conducted in 1988-89.

family will be helpful in increasing the income, because they get paid for working but this concept, however, is not true, as is evident from Table 1, which shows that the number of earning members is more or less similar in large as well as in smaller families.

The average number of persons per family is the highest in Navalpur village because of the fact that the joint family system is still quite strong here. This average is considerably low at Bandri-Karoti village. A slight increase in this average is observed in families of Mundra Jaruakhera and Semra Ramchandra villages. The reason for smaller family size of Bandri-Karoti and Mundra Jaruakhera villages is that, these two villages are directly connected with communication links and the government employees and other educated persons come into contact with the natives. As a result, the families are planned. Similarly Semra Ramchandra village is also directly connected with Banda town and the people of this area are also aware of the modern amenities. The children of these villages, after completion of their education migrate to nearby urban places to seek employment. The same condition is also found at Kherana village where the average number of family members is 5.76 persons. Educated persons have migrated from this village also. Katangi village has remained underdeveloped and perhaps for this reason the average family size is 6.30, which at

Patharia Jat and Hiranchhipa villages is over seven persons. The main reason for larger families, in these villages perhaps is that the urban areas of Sagar are nearer to these villages and the villagers get employment or are engaged in business, thus their migration towards the towns is minimised, resulting in large families.

As far as the number of earning members in a family is concerned it is noticed that village Navalpur exhibits the maximum of over four which perhaps results from the large-sized families. Besides all the family members are engaged in their traditional occupations and thus all men and women work either at fields or at home.

The average number of earning members of a family at Pathoria Jat is 3.04. One factor of particular benefit for this village is its location near Sagar city because of which the people get better chances of employment and business very easily in comparison to other villages.

At Katangi village, the average number of earning members is quite low (2.8) which is largely due to lesser employment opportunities. In Hiranchhipa and Mundra Jaruakhera villages the average number of earning members is equally low, but this is due to different reasons. Hiranchhipa is nearer to Bina town and is influenced by it, whereas Mundra Jaruakhera is influenced by the Railway Station, schools and

government agencies. Thus almost all the children are engaged in studies while the womenfolk are housewives and therefore are not counted in the category of earning members. Due to this factor the average number of earning members of these villages is low. The average number of earning members per family in Semra Ramchandra, Kherana and Bandri-Karoti villages is 2.66, 2.66 and 2.20 respectively. It can thus be concluded that the average number of earning members per family at various villages is much less than that for Sagar district.

#### Household Income and its source

The maximum number of households of India have annual income below the poverty line. The problem of poverty in the country appears to be not merely of the low level of income but is related to a very high degree of inequality in the distribution of income even at the lowest level (Reddappa, 1984, p 40). The similar trend is noticed in Madhya Pradesh also.

In the rural areas of Sagar district the maximum percentage of the households has annual income between Rs. 2,400 and Rs. 3,600

(Table 2). The other category of the income group of Rs. 3601 to 4800 represents 20 per cent of the households. The minimum percentage (1.05%) percent of the households has earning of less than Rs. 2,400. It can thus be concluded that the households belonging to the middle income group is maximum. As the income group increases towards higher level, this percentage is found to be declining (Table 2). In the northern and western regions of the district the maximum number of households have low annual income. Bandri-Karoti, Mudra-Jaruakhera, Semra Ramchandra and Katangi villages are the examples of low income level.

Occupation is a significant component for measuring and identifying rural and urban poverty. An analysis of occupations of the poor people will reflect not only the source and amount of their income but also the incentives to work, working conditions, job-environment and hierarchy of the occupation (Gupta, 1987, p. 123). The main occupation of the household is the one from which is obtained a major share of income.

Why the people's income is low, can be

TABLE - 2

#### Sagar District : Per cent Distribution of Households in Different Income Groups

Name of Village	Income Groups (Rupees per annum)								
	0 to 2400	2401 to 3600	3601 to 4800	4801 to 6000	6001 to 7500	7501 to 10000	10001 to 15000	15001 to 20000	20001 and above
Patheria Jat	Nil	4.16	4.16	Nil	33.33	16.66	8.33	16.66	16.66
Hiranchhipa	Nil	20.00	10.0	20.00	5.00	20.00	15.00	5.00	5.00
Bandri-Karoti	4.00	36.03	24.0	12.00	4.00	16.00	Nil	Nil	4.00
Mudra	Nil	37.03	18.5	18.50	7.40	11.11	3.70	3.7	Nil
Jaruakhera									
Semra	Nil	29.16	33.33	8.33	25.00	Nil	4.16	Nil	Nil
Ramchandra									
Navalpur	Nil	33.33	14.28	9.52	4.76	19.53	4.76	14.16	Nil
Khertana	Nil	26.92	26.92	19.23	11.53	Nil	Nil	Nil	3.84
Katangi	4.34	39.13	26.08	4.34	13.04	4.34	4.34	Nil	4.34
AVERAGE	1.05	28.42	20.0	11.57	13.15	12.01	4.73	4.73	4.21

Source : Based on sample surveys conducted in 1988-89.

understood clearly if one looks at the sources of their income. In the rural areas of the district the four sources of income, in order of preference, are cultivation on small patches of land and agricultural wages (36.8%), non-agricultural wages (34.2%), services (17.4%) and petty business (11.6%).

### Conclusion

Most of the people are engaged in petty cultivation, some of them are also non-agricultural wage-earners, the percentage of petty businessmen, salary earners and self-employed people is much less than that of the cultivators. This is due to the fact that there is complete absence of small-scale and other industries. These are some of the factors that explain high percentage of people below poverty line in the region. The settlements which offer frequent job opportunities to the people comprise the villages situated at the northern highland, Dhasan upland and southern highland regions. The land in these areas is very fertile especially in the Khurai-Bina plain and Bewas upland. The people of these areas are able to get jobs throughout the year.

In some villages it is noticed that most of the households have larger families and though the number of earning members is large, they do not get work during the whole year and also their income is not much. Therefore, in such regions, acute poverty and uneven distribution of income are prevailing. The western part of the Khurai-Bina plain and western parts of Dhasan upland are the areas where poverty ratio is less in comparison to other regions.

It can be concluded, on the basis of distribution of income in the rural areas of Sagar district, that all the families are not able to afford the bare minimum necessities of life.

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