# Village size and Development in India

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## Introduction:

India is a predominantly an agricultural and rural country. An overwhelming majority (72.2 percent) of her people live in the countryside. There are 638,588 villages in India according to 2001 census. The trend in percent rural in the last hundred years from various Indian censuses is given below:

| Year | Percent Rural |
|------|---------------|
| 1901 | 89.2 |
| 1911 | 89.7 |
| 1921 | 88.7 |
| 1931 | 88.0 |
| 1941 | 86.2 |
| 1951 | 82.7 |
| 1961 | 82.0 |
| 1971 | 80.1 |
| 1981 | 76.7 |
| 1991 | 74.3 |
| 2001 | 72.2 |

*Source: Census of India*

An idea about the structure and organization of Indian villages can be obtained from old ethnographic surveys and preliminary studies. The following features characterize villages in most parts of India.

a) As a territorial, as well as social, economic and ritual unit, the village is a separate and distinct entity. The residents of this settlement recognize their corporate identity, and it is recognized as such by others. It is not uncommon to find in them

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a sentiment of attachment towards their own settlement site. In several matters the village acts as a unit.

b) The villages in India were self reliant and self dependent. Different people were engaged in different profession and provided services to each other.

c) The members of the local group are bound together by ties of mutual and reciprocal obligations. Interpersonal and inter-group relations in several spheres of village affairs are governed by an established usage and social ethics. Breaches of the norms of the community and its established usage are dealt with by the village council, speaking for the village and had the final authority of social ostracism through which it can effectively enforce its sanctions. (Marriot, 1955; Dubey, 1955; Bailey, 1957; Mayer, 1960; Pradhan, 1966; Gould, 1982; Robinson; 1988 and Gold; 1990)

## Village studies in the late-nineteenth and twentieth centuries in India:

The social reality of the village and its relationship with the regional social environment has been the focus of many debates in both colonial and postcolonial literature. Such debate has led to a refinement in the methods of data collection, especially in fieldwork, as well as developments in the disciplines of sociology and social anthropology over the twentieth century. Under, British rule concrete steps were taken to describe and classify the village community. This was necessitated by administrative and revenue needs, as also the desire to understand the socio-economic conditions of the people who were being governed. Census reports as early as the 1880s along with gazetteers, district handbooks and regional surveys, brought together varied information on village community.

Colonial literature is replete with images that are now recognized as stereotypical and often mythic, such as the belief in the self sufficiency of the village or it's being a 'little republic'. For instance a House of commons report of 1812 (Campbell, 1852), described the typical village as occupying large acres of both waste and arable land; having officers such as that of the head man, revenue collector, accountant and police boundary man, and with an internal economy that remained largely unchanged. Besides being a unit of administration, the village was also the prime source of revenue collection.

In late nineteenth century, there were several attempts at systematic data gathering, such as statistical survey of the country by Francis Buchanan in the 1810s, which was spread

over several years. It covered areas ranging from Orissa, Assam, Bihar, and Uttar Pradesh to East and West Pakistan.

In 1901, an ethnographic survey of India was attempted as a part of 1901 census. In 1916, Gilbert Slater carried out village-based surveys with a focus on economic issues. In 1917 and 1921, H.H.Mann, Principal of the college of agriculture at Poona directed two studies on the functioning of economic life in villages of the Deccan. O'Malley, the superintendent of census operation (1934) wrote extensively on village life and was particularly critical of the earlier work of scholars.

The study of village communities, however, became a major academic concern only in the years following independence, when the Government invited scholars to help understand social life, tradition and norms at the village level. Issues of national development came to be closely identified with the upliftment of village India, which Mahatma Gandhi had insisted since 1920s, as the real India. Modernizers like Jawaharlal Nehru too had identified the plight of the peasantry as a central concern (Nehru, 1961). The new village studies based on monographic style changed the perception of rural India and marked a critical development in the social sciences.

Although many of the studies were descriptions of everyday village life, there was a tendency to focus on caste. Beteille (1969) states how the shadow of the caste hung over most village studies on the 1960s. Inden (1990) wrote similarly on how this interest in caste created an impression of the village being just an economic and living space. Besides being a hangover of colonial writing, such a conception was also the result of work such as that of Louis Dumont and David Pocock (1957), on the defining aspects of village life. For them, the village was little more than a social space; caste is what made it a social reality. (Srinivas, 1952; Bailey, 1957, 1963; Beteille, 1965; Kessinger, 1971; Shah, 1973; Chakravarty, 1975).

As part of the 1961 census, a survey of about 500 villages was made and as part of the 1971 census, a restudy of 80 villages has been taken up. The village studies centre round the following themes:

i.  To what extent and in what manner the village was a distinct unit during the earlier study and is still so.

ii. Whether the village is displaying increasing urban character; if so, in what manner.

iii.     What is the interplay of the various factors that have helped for impeding the full utilization of the amenities and infrastructure of growth available to the villages?

iv.     Whether the village life is marked by increasing cohesion or conflict.  If so, what are the contributory factors?  Whether the same implies a trend towards more egalitarian social structure, more participation in the political process, a better standard of living for all; or, whether it implies a reverse process in any aspect.

v.     To what extent and in what manner the micro-demography of the village can be studied in terms of an eco-system comprising of physical environment, technology, social organization and population by diverse attributes.

vi.     Whether it is possible to derive certain general orientations and insights from the study of the village, which can be applied for the interpretation of the demographic data for the taluk, the district and the region.

vii.     Whether in the light of the study in the village, it is necessary to modify the concepts, tools and instruments relevant to the collection and presentation of socio-economic data in general and demographic data in particular.

To sum up, if we look at village studies as they developed over the 19th to the 20th century, we find a gradual shift from pure information gathering of the kind undertaken by the colonialist to detailed ethnographic studies undertaken by social anthropologists such as the Wiser's (1933).

Village studies in the past have mostly been done by the sociologists and anthropologists. These studies mostly dealt with the general structure of the village administration and more so with the role of caste in influencing one's position in the village social structure. None of the studies tried to develop any sort of linkage between the village size and the various socio economic characteristics of the village. No attempt has been made to see whether literacy level of people, occupational pattern of the people and standard of living of people change with the changing size of the village. How the access to safe drinking water and sanitation facilities are related to the size of the village where the people live? We may categorically state that no demographic study in the past exclusively tried to document the association between size of village and socio economic and demographic development. Very recently with the development of sophisticated research and data analysis tools,

demographers have started trying to develop relationships between said variables. Some studies even analyzed village characteristics and utilization of various maternal and child health related variables (Kravdal 2004; McNay 2002; Ram and Singh 2006; Stephenson and Tsui 2002). Some of the important community level variables considered in these studies are population size of the community, availability of health infrastructure in the community, availability of traditional forms of health care, availability of all weather road in the community, distance to nearest transport facility, etc.

A majority of India's population lives in villages. Size of the villages in terms of population varies drastically in India. Some villages are very small having less than 50 residents and some are as large as having more than 10, 000 residents. Again it has been observed that villages in northern India are generally smaller than those in the southern India. On the contrary, the demographic and socio economic development seems to be more in the southern India compared to the northern India. The important question that arises at this point is that 'is socio economic and demographic development has anything to do with size of the villages?' No empirical evidence exists in the extant demographic literature to answer this question. The present study is an attempt in this direction. The specific objectives of the study are: (1) to study the trend in proportion of population living in different size villages; (2) to study the association between village size and socio economic characteristics; (3) the association between village size and demographic behavior (use of contraception, number of living children and utilization of maternal and child related service utilization like going for antenatal care services, going for safe delivery and child immunization); and (4) to examine whether and to what extent village size explains the variation in the socio economic and demographic behavior.

## Data and Methods:

The data for the present analysis has been taken from three sources namely Census of India, National Family Health Survey 1998-99 (NFHS II) and Rapid Household Survey 1998-99 (RHS-RCH) under the Reproductive and Child Health Project. The first comprehensive census of population in India was conducted in 1881. Since then the censuses are carried out after every 10 years. This has been a regular practice in India since the conduct of the first census in 1881. Census of India generally collects information on socio economic and demographic characteristics, educational characteristics and migration. Detailed information is collected on these issues and is published in different census publications. The census of

India regularly publishes primary census abstracts (PCA) containing information on total population by place of residence (rural or urban) and sex, 0-6 population by place of residence and sex, total number of households, educational level by place of residence and sex, scheduled caste and tribe population, etc. The analysis of census data in the present paper is mainly restricted to the analysis of data from PCA. The villages have been classified into three categories based on the size of their population. The three categories are: (1) Low (having population less than 1000); (2) medium (having population between 1001-2500); and (3) High (having population more than 2500).

The proportion of different size villages, proportion of population living in different size villages and the growth of different size villages have been computed and presented in the paper. Exponential law of population growth rate is employed to compute the growth rates for the different size villages. The analysis is carried out for only eight states of the country selecting two states from each geographical region. The selected states are West Bengal and Bihar (eastern region); Maharashtra and Rajasthan (western region); Punjab and Uttar Pradesh (northern region); and Andhra Pradesh and Tamil Nadu (southern region).

The second part of the paper deals with the analysis of NFHS II data. The analysis of NFHS II is done to study the association between village size and the socio economic and demographic characteristics of women staying in different size villages in the selected states. NFHS II was carried out in the year 1998-99 in all the states of India. The data in NFHS II was collected on fertility, knowledge and practices of family planning methods, maternal and child health indicators, infant and child health indicators, etc. The aim of the survey was to provide estimates at the national and state level. The survey covered over 90, 000 ever married women in the age group of 15-49 years from almost all the states and union territories of India. Three different interview schedules namely household schedule, women schedule and village schedule were canvassed in the survey. For the present analysis we have merged data from women schedule and village schedule. The various socio economic variables considered in the analysis are literacy of men and women, standard of living of household, exposure of women to mass media, availability of safe drinking water and availability of toilet facility. Access to all weather roads is also used in the analysis. The maternal and child related service utilization variables include utilization of antenatal care, going for safe delivery and child immunization. Further, an attempt has been made to see the association between village size and children ever born and use of any family planning

method. Cross tabulations, chi-squares and logistic regressions have been used for this part of the analysis. The dependent and independent variables for the logistic regression analysis are given below:

| Dependent variables | Control Variables |
|---|---|
| Toilet facility =1, Not having toilet facility<br> = 0, otherwise | SLI[4], Education level, Caste |
| Drinking water = 1, Not having safe drinking water<br> = 0, otherwise | SLI, Education level, Caste |
| Standard of living = 1, Low standard of living<br> = 0, otherwise | Education level, Caste, Road[5] |
| Media exposure = 1, No media exposure<br> = 0, otherwise | Education level, Caste, Road, SLI |
| Use of contraception = 1, No use<br> = 0, otherwise | Age, Child survival, SLI, Caste, Media exposure, Education level |
| No. of children = 1, More than three<br> = 0, otherwise | Media exposure, Caste, Road, Education level |
| Antenatal care = 1, No ANC<br> = 0, otherwise | Age, Birth order, caste, Road, SLI, Education level |
| Delivery care = 1, Unsafe delivery<br> = 0, otherwise | Age, Birth order, caste, Road, SLI, Education level |
| Immunization = 1, Incomplete<br> = 0, otherwise | Age, Birth order, Road, SLI, Caste, Education level, Institutional delivery |

The third part of the analysis deals with the data at the district level. A district is a lower unit of administration compared to states in India. Every state is comprised of several districts. For this part of the analysis we use a development index developed by Ram and

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[4] Standard of living
[5] Accessibility of road is defined as having all weather road within 2 kms of a village

Mohanty (2002) at the district level. The development index has been constructed from 10 indicators namely female literacy, gender disparity in literacy, sex ratio of 0-6 children, proportion of population in 0-6 age group, percentage of girls marrying below 18 years of age, proportion of birth order three and above, percentage of currently married women using family planning methods, percentage of women going for safe delivery, percentage of women who received complete antenatal care and percent of children under age three who received complete immunization. The first four indicators used in the construction of development index have been taken from the Census 2001 and the remaining come from the RHS-RCH. The construction of the index is given in Appendix. A correlation coefficient is run between the proportion of population living in large size villages in each district and the development index for the particular district. A positive correlation between the two will show that as the proportion of population living in large size villages increases, the value of development index for that district also improves throwing some light on the association between village size and the development at a level lower than the state.

## Results:

Table 1 gives the distribution of villages by their sizes. Most of states except Tamil Nadu and Andhra Pradesh have village size less than 1000 persons. The proportion of villages having a population of more than 2500 ranges from 7 percent to 27 percent in 1991. According to 2001 census this proportion ranges from 9 percent to 32 percent. In both the censuses the proportion of villages with a population size of more than 2500 was highest in the south Indian states of Tamil Nadu and Andhra Pradesh. Apart from this, the proportion of large size villages has increased over the census period 1991-2001. The proportion of population living in different size villages is given in Table 2. Similar increase is also observed in the proportion of population living in large size villages during the census period 1991-2001. According to 2001 census the proportion of Population living in large size villages varies between 35 percent in Rajasthan to 66 percent in Tamil Nadu. Again we find that a large proportion of population in the two south Indian states stays in large size villages. To see the growth rate in the different size villages, we present the average exponential growth rates for the period 1991-2001 for the different size villages (Table 3). The small size villages (i.e. villages having less than 1000 population) have registered negative growth rates in all most all the states except the states of Rajasthan. On the other hand, the large size and medium size villages have gained during the census period 1991-2001; the gain being highest in the large

size villages. One caution is observed while interpreting growth rates, as we could not trace the different size villages existing in 1991 to compute the growth rates. We simply took the proportion of different size villages in the census 1991 and census 2001 and computed the growth rates. Therefore, these results should be interpreted with caution. In every state the exponential growth rates were observed to be above 2 percent, Tamil Nadu being the only exception. The highest growth rate was observed in case of Uttar Pradesh. In case of Tamil Nadu the reason for lower growth rate in the large size villages could be attributed to the declaration of many large size villages as towns by the Tamil Nadu Government. Overall, it can be clearly stated that large size villages are growing much faster compared to small size and medium size villages.

Table 4 gives the percent of women staying in villages not accessible by all weather roads, percent of women not having toilet facility and percent of women not having safe drinking water facility by the size of village of their residence. Accessibility to all weather roads in this paper is defined as having a road within 2 kms. of a village. Results show that a majority of women staying in small sizes villages having no accessibility to all weather rood. On the other hand the accessibility to all weather roads is much better to women staying in large sizes villages. This clearly indicates that it is the large size villages that are mostly connected to all weather roads. West Bengal and Uttar Pradesh are only exceptions as the accessibility of all weather roads in these states is better in small size villages compared to medium and large size villages. The reasons could be that in Uttar Pradesh the availability of all weather roads in general is very low to show any differential by size of villages. West Bengal is unique among the selected states in terms of governance where a particular political party is ruling for the last 30 years. As a result no economic progress was made by the state in last 30 years. The association between village size and accessibility to all weather roads is found signification in all most all the state. The percent of women not having toilet facility goes down with the increase in the size of village. This trend is observed in all the selected states. The association is also found statistically significant in all the states. To see whether the relationship holds after controlling for other confounding variables, we run logistic regression. The results clearly show that the relationship holds even after controlling for important confounding variables. Again the proportion of women not having safe drinking facility goes down with the increase in village size. As the size of village increases, the proportion of woman having safe drinking water facility also increases. The association is found to be significant in chi-square and in logistic regression. In nutshell, we find that the

accessibility of all weather roads, having toilet facility and having safe drinking water facility increases with the size of villages; the large size villages having better access and facilities. It is worth mentioning here that accessibility to all whether road has important bearing on the utilization of various services and especially the maternal and child health services. Also it may have significant influence on treatment seeking in case of illness and morbidities. Similarly the availability of toilet facility and safe drinking water facility are important in explaining the morbidity and mortality experience of a population. Studies in the past have shown significant association between availability of toilet facility and safe drinking water facility and prevalence of morbidity and mortality. Therefore, the above findings become important from the view of policies and programmes.

Tables 5 presents the proportion of illiterate women, proportion of women whose husbands are illiterate, proportion of women living in households with low standard of living and proportion of woman with no exposure to mass media by the size of village where they live. It is well known that the level of literacy is one of the key indicates of social development in a community. Literacy, especially female literacy, is related to almost all the demographic variables e.g. low birth rate, low infant and child mortality rates and higher use of contraception and higher utilization of other maternal and child health related services. Exposure to mass media has been found important in explaining enhanced use of various maternal and child health related service utilization. In a county like India where a large proportion of women are illiterate or have little formal education, informal channels of education like exposure to mass media can play important role in imparting knowledge and awareness and bringing change in the society. Mass media can also act as an important facilitator in over coming traditional and culturally belief and thus enhancing the participation of the masses in various welfare programmes.

The analysis shows significant association between literacy of women and size of village; the proportion of literates being higher in large size villages compared to those in small size villages. Similar association can be found between the literacy of husbands and the size of village. Bihar and Uttar Pradesh are exceptions in this regard. It is important to mention here that the overall literacy in these two states is very low which may to some extent explain this erratic behavior. In absence of any direct measure of income standard of living of a household can be taken as in indicator of the economic status of a household. In NFHS, no direct question is asked about the income of the respondent. However, several

questions were asked on the household's possession of assets and amenities. The responses to these questions have been used to construct the standard of living index. The constructed standard of living index can be taken as a proxy for the income of the households. We again find a similar positive association between the size of villages and the standard of living of the households. The association is found significant in almost all the states. We find less proportion of low standard of living households in large size villages compared to small size villages. In NFHS, women were asked certain questions on whether they read a newspaper or magazine, watch television or listen to a radio at least once a week, and whether they visit cinema or theater at least once a month. The variable on exposure to mass media has been constructed based on the responses on the above-mentioned questions. Again, the exposure to mass media is found to be better in case of women living in large size villages compared to women who are living in small size villages. The results hold good in most of the selected states.

The percent of women currently using any method of family planning and percent of women having more than 3 children are given in table 6. Table clearly shows that a higher proportion of women in large size villages are currently using any method of family planning compared to women in small size villages. This association is found significant in the states of Andhra Pradesh, West Bengal and Bihar. We get mixed results while analyzing the relationship between size of village and the proportion of women having more than 3 children. In majority of the states the association is found to be significant. In Maharashtra, Tamil Nadu and Andhra Pradesh we find a negative association between village size and the proportion of women having more than three children i.e., the proportion of women having more than 3 children goes down with the increase in the size of the village. Even after controlling for other important confounding variables the relationship holds good in case of Tamil Nadu. On the other hand, we find a positive association between village size and proportion of women having more than 3 children in the states of Bihar, Uttar Pradesh and West Bengal.

Some indicators of maternal and child health care service utilization according to the size of the village are given in Table 7. We do not get any clear picture about the association between size of villages and the utilization of antenatal care by pregnant women. In few states we find the utilization of antenatal care to increase with the increase in the size of the village. In other states it is found to decline with the increase in the size of the village. Again

the size of village is found to be positively related with the proportion of women going for safe delivery. Safe delivery here is defined as delivery in a medical institution and if at home then attended by a trained health professional. The relationship is found to be significant in the state of Maharashtra, Bihar and Rajasthan where even after controlling for the important confounding variables the relationship holds good. In these states increase in the size of the villages is accompanied by a decrease in the proportion of woman going for unsafe deliveries. In other state the association was not found to be significant. Studies done in the past have shown strong community level influences on service utilization, although the type of community effect varies by service type (Stephenson and Tsui 2002, Ram and Singh 2006). Again we do not find any clear-cut association between the village size and the proportion of children that are completely immunized. In case of Punjab, Utter Pradesh and West Bengal we find decline in coverage of complete immunization with the increase in village size. In case of Maharashtra, Bihar and Rajasthan we find an increase in the coverage of complete immunization with the increase in village size although the association is not significant.

Table 8 gives the correlation coefficient between the percent of population living in large size villages in each district of every state and the index of development for each district of every state. It is obvious from the table that the index of development is positively related with the percent of population living in large size villages in a majority of states. However the correlation coefficient is found significant only in the state of Andhra Pradesh and Utter Pradesh. In Punjab and Bihar we found negative correlation between percent of population living in large size villages and development index. Bihar is one of the relatively poor performing states of the country on the socio economic front. Therefore, it is not surprising to get such kind of results for Bihar. However, it is difficult to explain the direction of correlation coefficient in case of Punjab.

## Summary and Conclusion:

Sociologists and anthropologists have mostly done village level studies in the past and the major focus of their studies were the ethnic composition, power relations among the different communities and its role in governing the village life. Demographers have very recently shifted their attention to the effect of community or village where individual lives on the demographic behavior and health related service utilization. Studies in the recent past have

tried to explain the demographic behavior and utilization of maternal and child related services through community level variables. But none of the studies in the past have exclusively dealt with the effect of village size on socio economic development in general and demographic behavior and health related service utilization in particular. Many researchers have tried to explain contraceptive use, utilization of antenatal services, child immunization through village level variable such as whether school is available in the village or not, whether the village is connected by an all whether road, whether a primary health center is available in the village, etc. But none of the previous studies tried to see the effect of village size on socio economic development. Singh carried out a study on child immunization in the state of Madhya Pradesh in India trying to explain child immunization through the size of village. The present study tries to explain the socio economic development through the size of the village. Then the study proceeds to develop some relationship between size of village and demographic behavior and maternal and child health related service utilization.

The study is carried out in three separate parts. In first part we deal with the census data to have some idea about the proportion of different size villages in the selected states in India. Further, the proportion of population in different size villages is given along with the growth rates observed in the different size village during the census period 1991-2001. We find that in the south Indian states that are advanced in socio economic development, a large proportion of their population lives in large size villages. Again they have higher proportion of large size villages compared to the states from northern and the eastern part of the country. Higher growth rates were observed in large size villages compared to small size villages in all most all the states. This phenomenon is very much consistent with the growth of cities where big cities grow at much faster rates compared to small cities and towns.

The second part of the paper deals with the analysis of data from the National Family Health Survey conducted in India in 1998-99. In absence of any other reliable data on the villages, this data is utilized to examine the linkages between village size and socio economic development. The analysis clearly shows that large size villages have better access to all weather roads, the literacy among women and men is better in large size villages, a higher proportion of women have higher standard of living and have better exposure to mass media, the availability of sanitation facility and safe drinking water is better in large size villages compared to those available in small or medium size villages. We can conclude that large size villages to a large extent are much more socio economically developed compared to small

size villages. These findings become crucial because these are the variables that shape the attitude and behavior of individuals towards various heath related service utilization. Again these variables have significant influence on altering demographic indicators.

The analysis further tries to develop relationships between village size and demographic behavior. Unlike the effect of village size or low economic development, the relationship between village size and demographic indicators and maternal and child health related service utilization is little less clear. We find mixed findings. In some states the large size villages are found to be associated with higher contraceptive use and a lower proportion of woman having more than three children. In other states we find contradictory results. The negative association is mostly found in the northern states of the country, which are among socio economically, and demographically poor performing states. The level of socio economic development and service utilization is so low in these states that expecting a differential by village size may not be very realistic. The state of West Bengal in the eastern part of country also behaves very erratically. It may be because of typical socio economic and political condition prevailing in the state. We find similar associations between village size and maternal and child health related service utilization. Here also the relationships are less clear.

On the basis of the analysis, it is found that the villages with higher size have the advantage over medium and smaller size of villages in the context of socio economic and demographic development in majority of the states. Also, we find that states that have higher proportion of their population in large size villages perform better in terms of socio economic and demographic development. Take for example, the south Indian states, where higher proportion of population lives in large size villages, are better developed compared to the north Indian states where a higher proportion lives in small size villages. The analysis shows that infrastructure development and availability and accessibility of facilities are much better in large size village compared to small size villages. It may, therefore, be concluded that policies and programmes should focus on the small size villages also to achieve the demographic targets and increase the utilization of various health related services. This is particularly required in northern states of India where a higher proportion of population stays in small size villages.

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Table 1: Percentage distribution of villages by their size, 1991 and 2001

| States | Village Size (Population) | | | | | | | |
| | <=1000 | | 1001 - 2500 | | > 2500 | | No. of Villages | |
| | *1991* | *2001* | *1991* | *2001* | *1991* | *2001* | *1991* | *2001* |
|---|---|---|---|---|---|---|---|---|
| **Maharashtra** | 59 | 54 | 32 | 34 | 9 | 12 | 39350 | 40341 |
| **Punjab** | 59 | 53 | 31 | 35 | 10 | 12 | 12065 | 11979 |
| **Tamil Nadu** | 33 | 29 | 40 | 39 | 27 | 32 | 17531 | 15299 |
| **Andhra Pradesh** | 43 | 40 | 33 | 33 | 24 | 27 | 25812 | 25990 |
| **West Bengal** | 59 | 54 | 27 | 29 | 14 | 17 | 36935 | 37109 |
| **Bihar** | 65 | 38 | 24 | 27 | 11 | 15 | 65275 | 66234 |
| **Rajasthan** | 70 | 63 | 23 | 28 | 7 | 9 | 36171 | 38237 |
| **Uttar Pradesh** | 65 | 56 | 27 | 35 | 8 | 12 | 108160 | 108857 |

*Source: Based on Census 1991 & 2001*

*Table 2: Percentage distribution of population by village size, 1991 and 2001*

*1*

| States | Village Size (Population) | | | | | | | | | |
| | <=1000 | | 1001 - 2500 | | > 2500 | | Total Population (000) | | Average Size | |
| | *1991* | *2001* | *1991* | *2001* | *1991* | *2001* | *1991* | *2001* | *1991* | *2001* |
|---|---|---|---|---|---|---|---|---|---|---|
| **Maharashtra** | 25 | 21 | 40 | 38 | 35 | 41 | 48376 | 55762 | 1224 | 1382 |
| **Punjab** | 26 | 21 | 40 | 41 | 34 | 38 | 14280 | 16089 | 1184 | 1343 |
| **Tamil Nadu** | 9 | 7 | 31 | 28 | 60 | 65 | 36778 | 34919 | 2098 | 2282 |
| **Andhra Pradesh** | 10 | 8 | 29 | 26 | 61 | 66 | 48598 | 55383 | 1883 | 2131 |
| **West Bengal** | 21 | 16 | 32 | 30 | 47 | 54 | 49345 | 57728 | 1336 | 1556 |
| **Bihar** | 25 | 19 | 32 | 29 | 43 | 52 | 74962 | 95214 | 1148 | 1438 |
| **Rajasthan** | 34 | 27 | 37 | 38 | 29 | 35 | 33897 | 43259 | 937 | 1129 |
| **Uttar Pradesh** | 29 | 21 | 40 | 39 | 31 | 40 | 111394 | 137856 | 1030 | 1266 |

*Source: Based on Census 1991 & 2001*

*Table 3: Average annual exponential growth rate (%) of population by village size 1991-2001*

| States | Village Size (Population) | | |
|---|---|---|---|
| | **<=1000** | **1001 - 2500** | **> 2500** |
| **Maharashtra** | -0.40 | 1.10 | 2.90 |
| **Punjab** | -0.80 | 1.10 | 2.60 |
| **Tamil Nadu** | -2.30 | -1.40 | 0.10 |
| **Andhra Pradesh** | -0.70 | 0.20 | 2.10 |
| **West Bengal** | -0.60 | 0.80 | 2.90 |
| **Bihar** $^\Phi$ | -0.70 | 1.50 | 4.30 |
| **Rajasthan** | 0.20 | 2.50 | 4.50 |
| **Uttar Pradesh** $^\Phi$ | -1.00 | 1.80 | 4.80 |

*Source: Based on censuses 1991 & 2001*

*Φ The growth rates of Bihar and Uttar Pradesh refer to the respective undivided states*

*Table 4: Percentage of women staying in villages not accessible[#] by all weather road, not having toilet facility and not having safe drinking water by village size*

| States | Not accessible by all weather road | | | | | Not having toilet facility | | | Not having safe drinking water | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Village Size (Population)* | | | | | *Village Size (Population)* | | | *Village Size (Population)* | | |
| | **<=1000** | **1001 - 2500** | **> 2500** | **Total** | $\sqrt{\dfrac{\chi^2}{n}}$ | **<=1000** | **1001 - 2500** | **> 2500** | **<=1000** | **1001 - 2500** | **> 2500** |
| **Maharashtra** | 53 | 58 | 40 | 50 | 0.16* | 91 | 90 | 74*+ | 47 | 33+ | 19*+ |
| **Punjab** | 17 | 10 | 16 | 14 | 0.09* | 74 | 64+ | 56*+ | 3 | 2 | 1*+ |
| **Tamil Nadu** | 71 | 50 | 55 | 59 | 0.17* | 91 | 96+ | 80*+ | 20 | 23 | 12*+ |
| **Andhra Pradesh** | 57 | 27 | 19 | 25 | 0.22* | 86 | 92+ | 84* | 35 | 26+ | 29*+ |
| **West Bengal** | 54 | 74 | 69 | 68 | 0.15* | 89 | 70 | 67*+ | 27 | 7+ | 9*+ |
| **Bihar** | 68 | 55 | 42 | 54 | 0.21* | 92 | 90 | 85*+ | 36 | 23+ | 17*+ |
| **Rajasthan** | 70 | 71 | 68 | 70 | ** | 95 | 92+ | 80*+ | 44 | 48+ | 29*+ |
| **Uttar Pradesh** | 33 | 54 | 61 | 56 | 0.07* | 92 | 92+ | 81*+ | 25 | 20+ | 16*+ |

*Source: Based on NFHS 2*

*# Accessibility is defined as having all weather roads within 2 kms of a village*

* $\chi^2$ *is significant*

** $\chi^2$ *is not significant*

*+ Significant in logistic regression analysis*

Table 5: *Percentage of women who are illiterate, whose husbands are illiterate, household with low standard of living and no media exposure by village size*

| States | Illiterate Women | | | Husbands are illiterate | | | Low Standard of living | | | No media exposure | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Village Size (Population)* | | | *Village Size (Population)* | | | *Village Size (Population)* | | | *Village Size (Population)* | | |
| | <=1000 | 1001 - 2500 | > 2500 | <=1000 | 1001 - 2500 | > 2500 | <=1000 | 1001 - 2500 | > 2500 | <=1000 | 1001 - 2500 | > 2500 |
| Maharashtra | 52 | 54 | 44* | 29 | 30 | 18* | 56 | 47+ | 35*+ | 52 | 48 | 31*+ |
| Punjab | 39 | 46 | 50* | 26 | 34 | 33 | 4 | 7+ | 6*+ | 23 | 23+ | 27 |
| Tamil Nadu | 45 | 59 | 39* | 31 | 33 | 27 | 48 | 50 | 46 | 26 | 37+ | 23* |
| Andhra Pradesh | 64 | 67 | 56* | 43 | 49 | 42 | 41 | 43 | 44+ | 35 | 37 | 23*+ |
| West Bengal | 59 | 53 | 53 | 35 | 40 | 37 | 56 | 50 | 54* | 53 | 44 | 48* |
| Bihar | 80 | 79 | 80 | 47 | 46 | 48 | 60 | 56 | 54* | 82 | 77+ | 75*+ |
| Rajasthan | 91 | 82 | 83* | 41 | 33 | 38* | 31 | 25+ | 25*+ | 80 | 76 | 69*+ |
| Uttar Pradesh | 76 | 77 | 76 | 31 | 29 | 33* | 33 | 35 | 32 | 64 | 66 | 61* |

*Source: Based on NFHS 2*

* $\chi^2$ *is significant*

+ *Significant in logistic regression analysis*


Table 6: *Percentage of women currently not using any contraception and having more than three children by village size*

| States | Not using any contraception | | | More than 3 children | | |
|---|---|---|---|---|---|---|
| | *Village Size (Population)* | | | *Village Size (Population)* | | |
| | <=1000 | 1001 - 2500 | > 2500 | <=1000 | 1001 - 2500 | > 2500 |
| **Maharashtra** | 43 | 42 | 41 | 36 | 36 | 31* |
| **Punjab** | 40 | 37 | 39 | 31 | 33 | 32 |
| **Tamil Nadu** | 54 | 57 | 57 | 26 | 29 | 22*+ |
| **Andhra Pradesh** | 51 | 50 | 44*+ | 30 | 31 | 27 |
| **West Bengal** | 43 | 37+ | 41* | 31 | 29 | 32+ |
| **Bihar** | 81 | 78 | 77* | 40 | 43 | 45*+ |
| **Rajasthan** | 65 | 63 | 64 | 44 | 44 | 44 |
| **Uttar Pradesh** | 76 | 76 | 75 | 44 | 48+ | 48*+ |

*Source: Based on NFHS 2*

* $\chi^2$ *is significant*

+ *Significant in logistic regression analysis*

*Table 7: Percentage of women without any ANC, with unsafe delivery (delivery not at medical institution and not attended by any health professional) and children with incomplete immunization by village size*

| States | Without any ANC | | | Unsafe delivery | | | Incomplete immunization | | |
|---|---|---|---|---|---|---|---|---|---|
| | *Village Size (Population)* | | | *Village Size (Population)* | | | *Village Size (Population)* | | |
| | <=1000 | 1001 - 2500 | > 2500 | <=1000 | 1001 - 2500 | > 2500 | <=1000 | 1001 - 2500 | > 2500 |
| **Maharashtra** | 14 | 14 | 10 | 65 | 60 | $45^{*+}$ | 31 | 34 | $27^{*}$ |
| **Punjab** | 22 | 28 | $41^{*+}$ | 42 | 39 | 44 | 21 | $43^{+}$ | $38^{*+}$ |
| **Tamil Nadu** | 1 | 1 | 2 | 25 | 23 | 20 | 18 | 21 | 20 |
| **Andhra Pradesh** | 9 | 13 | $7^{*}$ | 29 | $51^{+}$ | $36^{*}$ | 45 | 52 | 48 |
| **West Bengal** | 6 | 13 | 11 | 61 | 63 | 65 | 59 | 58 | $67^{*}$ |
| **Bihar** | 61 | 65 | $71^{*+}$ | 82 | $78^{+}$ | $76^{*+}$ | 92 | 90 | 90 |
| **Rajasthan** | 60 | 56 | $55^{*}$ | 74 | 71 | $66^{*+}$ | 87 | 85 | 83 |
| **Uttar Pradesh** | 70 | 70 | 71 | 82 | 83 | 82 | 78 | 81 | $85^{*+}$ |

*Source: Based on NFHS 2*

* $\chi^2$ *is significant*

+ *Significant in logistic regression analysis*

*Table 8: Correlation coefficients between percent in large size villages in a district and district development index*

| States | Index of development |
|---|---|
| **Maharashtra** | 0.02 |
| **Punjab** | $-0.70^{*}$ |
| **Tamil Nadu** | 0.08 |
| **Andhra Pradesh** | $0.50^{*}$ |
| **West Bengal** | 0.18 |
| **Bihar** | -0.02 |
| **Rajasthan** | 0.07 |
| **Uttar Pradesh** | $0.37^{*}$ |

* Significant at 5 percent level

**Appendix: Construction of Development Index**

*Choice of indicators*: The development index is constructed on the basis of four indicators from Census of India, 2001 and six indicators from RCH. The variables selected from census are 1) Female literacy 2), Gender disparity in literacy (female literacy/ male literacy * 100), 3) Sex ratio of 0-6 children (female/ male * 1000) and 4) Proportion of population in 0-6 age group. The remaining six variables which are selected from RCH are 5) Percentage of girls marrying below 18 years of age, 6) Proportion of birth order three and above, 7) Percentage of currently married women using family planning methods, 8) Percentage of safe delivery[6], 9) Percentage of women who received complete ANC[7], 10) Percent of children under age three who received complete immunization[8].

*Standardization of Indicators*: The indicators may be grouped into positive and negative indicators. For example coverage of complete immunization is a positive indicator while proportion of births order three and above is a negative indicator. In computing composite indices we have to make them uniform and therefore there is need of standardization of each indicator. For positive indicators, index is usually computed as,

$$100 * ( V_i - V_{min} ) / (V_{max} - V_{min} )$$

In other words, index value is [Actual value in the series – Minimum value in the series] divided by [Maximum value – Minimum value]. This simply states that the district with a lowest value will get a score of '0' and district with a highest value will get a score of '100'. In case variables affect negatively, index is computed as,

$$100 * ( V_{max} - V_i ) / (V_{max} - V_{min} )$$

The upper and lower limit is the highest and lowest value observed in the series. The development index is nothing but a composite index, which is the average of all the ten indices.

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[6] Safe delivery means deliveries by trained health professionals either at hospital or at home.
[7] The complete ANC includes at least one TT injection, 3 ANC check up and consumption of 100 IFA tablets.
[8] The complete immunization includes BCG, 3 doses of polio and DPT and measles