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TRIUMPH OF THE DEMOGRAPHIC TRANSITION

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Abstract

Dire consequences of population growth as predicted by the Malthusian Model have receded for good. The Demographic Transition Model that lays out the process from high birth rate and high mortality rate to the desirable low birth rate and low mortality rate appears inevitable. All countries are undergoing the demographic transition. More and more countries are completing the transition to low birth rate and low mortality rate with stable population. Now a new concern is emerging in the developed countries that a stable population will result in little economic growth and fewer economic opportunities.

This unique issue of the journal is a tribute to commemorate Dr. Gurdev Singh Gosal. He was an inspiring teacher, mentor, father figure and a role model for generations of students who came in contact with him over his more than four decades long academic career. Like his other students, I was fortunate to receive the gift of life transforming generosity from him. Because I work in the United States, I had the privilege of communicating with him through letters. Dr. Gosal was a great letter writer. The letters were full of joy and uplifting in spirit. Dr. Gosal was always interested in new trends in geography curriculum and research. This essay on the triumph of the demographic transition is about a development that would have interested Dr. Gosal.

Historical Context of Population

The significance of the Demographic Transition Model has to be understood in the context of the debate on the consequences of population growth. Three major revolutionary breakthrough events have contributed to the population growth and the development of human culture and society. All human beings today are the beneficiaries of these innovations. These three events are: tool making/tool using, the domestication of plants and animals and the industrial revolution.

Homo-sapiens, whose origin traces back approximately 200,000 years, were tool makers and tool users. They also used fire for cooking and for keeping warm. These ancestors who developed hunting and gathering were collectively termed as the Paleolithic society. This stage of human development is referred to as the Paleolithic period. About 10,000-11,000 years ago humans started domesticating plants and animals around the Fertile Crescent in the Middle East. Subsequently, these innovations spread to South Asia, South East Asia, East Asia and East and West Africa. In all these places, humans domesticated plants and animals living in the local geographic environment and also benefited from the diffusion of additional agricultural products through contacts and trade. Later, in the new world, Central America and the Andean region of Peru developed the domestication innovations independently without the benefit of contacts and trade from the sphere of Southwest Asia. It is argued that population growth was one of the catalysts that spurred the domestication of plants and animals.

The domestication of plants and animals ushered a period of vast innovations that resulted in the origin of cities, civilizations, empires, religions, writing systems, languages, technologies, social and economic organizations and all sorts of developments that are still a vital part of the foundation of human culture today. The industrial revolution, the third major force, started in Western Europe in the 18th century. Countries that have undergone industrialization are termed the developed world or rich countries with very high income and high quality of life. Population in these countries is highly educated and lives in metropolitan areas of cities and suburbs. The remaining countries are termed as the less developed or developing countries. These countries are in different stages of industrial development. Industrial development is a major force affecting all countries and is a pathway to improvements in living standards and quality of life.

Population growth is the direct result of these three major events in the history of mankind. Edward Deevey in his superb article in *Scientific American* (September 1960) provided estimates of population associated with these three revolutions. Hunting gathering, the Paleolithic society, reached a global population of 5 million people at the beginning of the era when the domestication of plants and animals started around 10,000 years ago. As a result of more food, population grew. At the time of Mesopotamian civilization around 6,000 years ago, the human population was estimated to be around 86 million, a seventeen fold increase. Major river valley civilizations and empires followed. Around the birth of Christ, that marks the beginning of the Gregorian calendar (BC-AD) the population is estimated to be 130 million people. Slow population growth continued for another 1500 years. The year 1650 AD is the marker for the beginning of the industrial revolution. At this juncture, the human population reached 500 million. After 1650 AD, the population growth rate picked up. Around 1850 AD the global population exceeded one billion. In a short period of 80 years, in the year 1930, the human population reached two billion. In a short 30 years, in 1960, another one billion people were added and population stood at 3 billion. Accelerated population growth continued. By the year 2000, human population reached 6 billion people. In 2014, the human population is reported to be 7.2 billion people. The projected population of 2050 is more than 9 billion people.

Above is a brief description of global population growth. There are wide variations among different regions of the world in terms of growth rate and total population. Growth of population is calculated by subtracting the death rate from the birth rate. To make it more accurate, in-migration can be added and out-migration can be subtracted. However, the dominant variable driving the growth is the difference between the birth rate and the mortality rate. For most of human history, the birth rate remained high and consistent. Fluctuation in the mortality rate was the principle factor driving population growth. Periods when food was plentiful experienced lower mortality rates and resulted in growth in population. These were good prosperous times. Whenever food was scarce due to crop failure or political instability, the mortality rate rose resulting in a little or no increase in population. Epidemics had a devastating effect on societies through very high mortality rates. Total population experienced a decline in such periods. The bubonic plague, also known as the black death in medieval Europe, was a most tragic event that devastated the European population. Small pox introduced by the Spanish Conquistadors in Mexico and Peru in the fifteen hundreds had an even more drastic effect on the native Aztec and Inca societies. The native population in North America suffered from a similar fate with the arrival of North Europeans. In India, the plague at the turn of the 20th century had a huge impact on population. Influenza in 1919-20 took the lives of 20 million worldwide. These epidemics brought misery, death and despair.

Malthusian Model

In the context of this background, two contrasting models; the Malthusian Model and the Demographic Transition Model are analyzed to understand the current and future prospects of population. Is it the ultimate fate of the human societies that the population will be controlled by rising mortality rates? Or are there optimistic

trends that the population will be controlled by the lower fertility rates?

Thomas Robert Malthus initiated a debate on the consequences of population growth with his monograph in 1798 with the title: "An Essay on the Principles of Population as it affects the Future Improvement of Society, with remarks on the speculations of Mr. Godwin, Mr. Condorcet and other Writers". This essay became the basis of the Malthusian Model. The Malthusian Model states that the population grows faster than the food production that sustains it. Population grows in a geometric progression (2, 4, 8, 16, 32...) whereas food production grows in arithmetic progression (2, 4, 6, 8, 10, 12...). Malthus postulated two constraints to control population, the moral restraints through lowering the birth rate and natural restraints that allow the mortality rate to rise. The only acceptable moral restraints to Malthus were late marriage and abstinence from sex. Malthus rejected birth control devices that were favored by his contemporary scholars as a means of controlling population. Malthus had a low opinion of his fellow human beings and thought of them as incapable of practicing moral restraints. Therefore, the only check on population will be delivered by natural restraints comprising of war, famine, misery, disease, etc. Malthus is forever associated with natural restraints and poverty as the result of population growth.

At the time of the publication of his essay in 1798, the French Revolution was raging in Europe. Structural changes in society were being proposed as the solution to poverty with the galvanizing message of liberty, fraternity and equality. Malthus was putting forth an alternative explanation of poverty: that it is large family size that keeps the family poor. Large family size results in a large labor force that in return depresses wages with resultant poverty. In an emphatic way what Malthus was saying was that the poor are responsible for their own poverty because of their unrestrained reproduction. His critics pointed out that, in all his seven elaborate revisions of his original essay, Malthus did not take birth control contraceptives as a solution to growth. Neither did he take into consideration that the income from manufacturing can lead to securing food supplies through trade especially with the Americas. Malthus' predictions of poverty as the result of population growth never materialized. The Industrial Revolution in the nineteenth and twentieth centuries resulted in unprecedented economic growth. After the Second World War, population growth accelerated in the poor countries known as the less developed world. In the 1960's and 70's neo-Malthusian scholars, such as, Garrett Hardin and Paul Ehrlich brought this population growth and the resultant poverty to the center of policy discussion. Neo-Malthusians accept contraception as a desirable means of controlling population. They also emphasize environmental degradation as the result of population growth. Neo-Malthusians have served the society well by highlighting and elevating concerns among policy makers to take actions to lower population growth and protect the natural environment and natural resources.

The Demographic Transition

Demographic Transition is an empirical model that describes demographic changes taking place overtime in an industrial society. The model describes the passage of societies or countries from high birth rate and high mortality rate to the desirable state of low birth rate and low mortality rate. There is a transitional stage in between these two ends of the continuum and thus the title Demographic Transition. In this transitional stage there is an explosion of population growth. Warren Thompson in 1929 is the first to describe this Transition from the demographic data he collected for many countries. He found the countries fall into three groups. Group A countries comprise the industrialized world of Northern and Western Europe and the United States which had completed the Transition and has low birth rate and low mortality rate. Population in this group will stabilize and stop growing or even decline. Group B countries of Southern Europe and Central Europe experienced decline in birth rate and mortality rate. These countries will be in the near future, within three to four decades, where the countries of Group A were at that time. Group C comprises the rest of the world with high birth rate and high mortality rate with no discernible trend in their decline. These are agrarian societies in the preindustrial stage.

Kingsley Davis in 1945 coined the term, the Demographic Transition. As countries pass through the transition from high birth rate and high mortality rate to low birth rate and low mortality rate, the mortality rate declines first, initiating the transition. In general, all people are enthusiastic and eager to adopt measures that prolong life and result in mortality decline. Mortality decline is celebratory and a desirable goal. Birth rate remains high and unchanged in the initial stage of the transition. This period coincides with explosive growth of population. After a lag period, the birth rate starts declining resulting in a declining growth rate. Transition completes when both mortality rate and birth rate are close and low resulting in little or no growth. Prior to the Demographic Transition, total population is small. At the completion of the Demographic Transition, the population is very large with little or no growth. Population growth is an inevitable result to achieve long lasting stable global population.

India and the Demographic Transition

What is the place of India among the countries of the world in relation to the Demographic Transition? India being a vast country with 1.3 billion people requires that we, also, examine these developments at the state level to develop a nuanced picture of the Demographic Transition.

The Population Reference Bureau compiles demographic data on all countries from all pertinent sources to publish a yearly world population data sheet. In this analysis the 2014 World Population Data Sheet is used. Birth and mortality rates per 1000 population are twenty two and seven respectively. Those rates are equal to the average of countries of South Asia as a whole. Sri Lanka, among South Asian countries, has the lowest birth rate of eighteen per 1000 population. China, in East Asia, has a very low birth rate of twelve per 1000 population. Brazil, another large country, has a birth rate of fifteen per 1000 population. India's birth and mortality rates are equal to the average of the countries comprising the less developed world. For India, to complete the Demographic Transition, the birth rate has to decline to ten or below. How quickly the birth rate declines will determine the total population at stabilization. With current demographic trends, the total population of India is projected to grow to 1,510 million in 2030 and 1,657 million in 2050.

For India, data on birth and mortality rates from 1950 to 2010 shows a consistent decline in the rates. For example, for the period 1950-55 the crude birth rate was 43.3 per 1000 population. The birth rate has declined to 23.1 in 2005-10. This is a substantial decline. The mortality during the same period declined from 25.5 in 1950-55 to 8.3 in 2005-10, an impressive decline. Total fertility rate, the number of children per woman, is another indicator of Demographic Transition. The total fertility rate was high, 5.9 children per woman, in 1950-55 and has declined to 2.73 children for 2005-10. Stabilization of population requires the rate to be 2.1 children per woman just to replace the two parents.

For this analysis, Indian states and union territories are arranged in three groups according to birth rates. Mortality rates are low and fairly consistent throughout India. Therefore, it is the birth rate that determines the population growth rate in India. The first group consists of states with low birth rates ranging from 13.2 per 1000 population in Goa to 16.9 per 1000 in Himachal Pradesh. This group includes the big states of Tamil Nadu, West Bengal, Kerala, Punjab and Himachal Pradesh and smaller units of Tripura, Manipur, Nagaland, Goa, Puducherry, Lakshadweep and Chandigarh. This group contains 20 percent of the nation's population.

On the opposite end is a group of states and union territories with high birth rates above 24 per 1000 population. Maharashtra has the highest birth rate of 35.1 per 1000 population. This group contains 44 percent of the nation's population. It includes the big states of Uttar Pradesh, Maharashtra, Madhya Pradesh, Rajasthan, Jharkhand, Chhattisgarh and smaller units of Arunachal Pradesh, Meghalaya and Dadra and Nagar Haveli.

The rest of the states containing two fifths of the nation's population are in the middle. Their birth rate is around the national average (21.6 per 1000 population) ranging between 17 to 24 per 1000 population. This middle group consists of big

states of Bihar, Karnataka, Gujarat, Andhra Pradesh, Odisha, Assam, Haryana, Delhi, Uttarakhand and smaller units of Mizoram and Sikkim. In a way this crude grouping illustrates the challenges the country faces to expeditiously lower the birth rate.

Factors for Lower Fertility

There are hosts of interconnected factors that result in the decline in fertility in all countries. Some factors are societal in nature and the others are based on personal preferences and aspirations. Among the societal factors, economic development is a pivotal factor and termed as the best contraceptive. Urbanization, which is a result of economic development and in turn stimulates more economic development, is always associated with declining fertility. The spread of education in general and female education in particular not only stimulates economic growth and modernization, but is also essential to fertility decline. Employment opportunities for females drastically lower fertility. Access to low priced and efficient contraceptives has a similar effect on fertility. The communication revolution of the last two decades has a salutary effect on the diffusion of knowledge and opportunities and income growth. A lower poverty rate is associated with lower fertility.

On the personal level social aspiration to attain a higher standard of living results in smaller family size. In the contemporary world, raising a child and paying for education for a prolonged period is a substantial expense. More children mean more expenses and less for the parents. There is an added incentive because parents want their children to be equal if not more successful than the children of their friends and relatives. This reinforces the determination of parents to make the necessary investments to provide the best education towards a rewarding professional career for their children.

Triumph of Demographic Transition

The influence of all these above factors that result in lower fertility is felt in varying degrees in all countries and societies. Globalization and economic growth are spreading at an unprecedented speed. All countries of the world have entered the demographic transition. A bench mark demographers use to denote pre-transition society is the mortality rate higher than 30 per 1000 population. There is no country on the 2014 World Population Data Sheet with such high mortality rate.

Urbanization is positively correlated with economic growth and decline in fertility. In 1880, the United Kingdom was the only country in the world where more than 50 percent of the population lived in urban places. In 2010 half the world population lives in urban places. Now the world population has become urbanized and urbanization is growing faster. Megacities, with more than ten million people are appearing throughout the developing world. Not only will the megacities usher in rapid economic development and growth but they will also reduce fertility. It is well understood that birthrates decline slowly in the initial phase of transition. The decline becomes rapid as the demographic transition progresses.

All the developed countries of the world have fertility rates that are below the replacement level of 2.1 children born to a woman during her life time. The whole of Europe has a below replacement fertility with zero annual population growth. In the United States fertility has now declined below the replacement level. Japan not only has a fertility rate below replacement level but its population growth rate is negative. China has a below replacement level fertility with a stabilizing population. South Korea, Taiwan, Australia, and New Zealand all have below replacement level fertility. It needs stressing that the replacement level fertility has to continue for more than a generation to achieve zero population growth and the stabilization of population.

There is a demographic concern in the developed world that lower fertility will result in economic stagnation and a decline of political influence on the global stage. Concern about lower fertility centers on the fact that fewer young people will enter the labor force and this will result in the decline in the gross domestic product. Increases in life expectancy as a result of abundance of food and good medical care will increase the total number of older people. In an economy with a decreasing workforce, how to pay for the pensions

and other benefits for the elderly will become contentious issues. The consumption pattern of the young by their purchases of homes and other durable goods drives the economy forward. The consumption of the elderly is of a different nature and does not provide the same stimulus to the economy.

Pro-natal policies to halt the demographic decline are prevalent in most developed countries. The policy prescription includes: paid leave for mothers for one year, sick leave for parents, subsidized day care for children less than three years of age and fully funded nursery school. Lump sum cash awards are given in Russia and Australia. Will these pro-natal policies have the intended effect of raising fertility? Or will they be construed as a desirable nurturing program for the children and timely help to the parents? All indications are towards the latter.

European countries along with the United States, Canada, Japan, South Korea, Australia, New Zealand and China have completed the demographic transition. Latin America and Caribbean countries are ahead of India and closer to completing the transition. South East Asia is also ahead of India. Sub-Sahara Africa has recently entered the transition and is behind India on the continuum of demographic transition. The high economic growth rate and substantial rise of the middle class in Ghana, Nigeria, Angola and already developed South Africa have the potential to push the trajectory of demographic transition on a faster track.

In India and the other developing countries, economic development is impressive. Middle classes are substantial and increasing. The world as a whole is fast moving towards completing the demographic transition. The demographic *nirvana* with a high quality of life and stable population is in sight. This is to be celebrated.

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URBANIZATION IN PUNJAB (INDIA):1891-1901

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Abstract

This paper attempts to understand the pattern of urbanization in Punjab during 1891-1901 with special reference to: (i) growth of urban population in terms of size-classes of urban centres; and (ii) spatial variations in growth of urban population. Though the study area had registered a small increase in urban population, it was quite high in areas that experienced agricultural prosperity following the extension of canal irrigation in the previous decade. Similarly increase of population was relatively high in Amritsar city and Phagwara town that were experiencing spurt in trade and other activities. However, the pace of urbanization in the rest of the state was quite indifferent.

Professor G. S. Gosal was a fine blend of several virtues like honesty, contentment, fairness, and temperance. His unassuming nature, a positive attitude towards life, and an abiding enthusiasm for academic excellence further underscore the role of the above virtues in his life.

As a teacher, Professor Gosal had exceptional qualities: a strong commitment to teaching and research, genuine appreciation of his colleagues' contribution in teaching and research, and making himself accessible to students and researchers.

Professor Gosal was probably among the select few who carry life-long gratitude towards their teachers from high school onwards. He was particularly fond of thanking G. T. Trewartha, his doctoral research supervisor, Richard Hartshorne, and A. H. Robinson, all from the University of Wisconsin, Madison, USA. Even with advancing old age, there came no decline in such expressions of gratitude

Introduction

Despite the fact that only 12.39 per cent of its population consisted of urban dwellers in 1901, Punjab had experienced a very low growth rate (3.32 per cent) of urban population during 1891-1901. This stemmed mainly from two factors i.e., lack of economic dynamism in much of the state as well as shortage of demographic surplus which are so very essential in early stages of urbanization

The decade was characterized by vigorous agricultural colonization of the Lyallpur Canal Colony (now in the Pakistani Punjab) which attracted a large number of migrants from the area now comprising the present Indian Punjab. This out-flow of thousands of peasants, agricultural labourers, and people of other castes from the state contributed to stifling the pace of urbanization which otherwise would have taken place during the decade. Equally important was the role of famines of 1896-1897 and 1899-1901 which had ravaged large tracts of the state, especially those in the Malwa region. The famine of 1899-1901 was more severe of the two and was followed by outbreak of cholera and malaria which together claimed considerable loss of life (The Imperial Gazetteer, p. 331). Besides, plague raged from 1896 onwards and took a heavy toll of life. Thus, due to the combined effect of all these factors i.e. large out-migration to the Lyallpur Canal Colony,

Table - 1
Punjab: Urban Centres by Size-Classes (1891 and 1901)

Size-class	Number		Per cent of Urban Population		Per cent of Urban Centres	
	1891	1901	1891	1901	1891	1901
I. 100,000+	1	1	15.12	17.38	1.27	1.30
II. 50,000-99,999	3	2	19.07	12.97	3.80	2.60
III. 20,000-49,999	4	4	12.92	15.67	5.06	5.19
IV. 10,000-19,999	10	14	14.56	20.12	12.66	18.18
V. 5,000-9,999	42	38	31.62	27.47	53.16	49.35
VI. Below 5000	19	18	6.71	6.38	24.05	23.38
Total	**79**	**77**	**100.00**	**100.00**	**100.00**	**100.00**

and the rise in death rate due to famines and attendant diseases, and ravages of plague, Punjab was not left with demographic surplus which is essential to feed the process of urbanization. Similarly, the fast increasing pauperization and land alienation of the Punjab peasant was another factor responsible for arresting the pace of urbanization during this period.

Changes in Urban Population (1891-1901)

Four towns got declassified during this period namely Rajpura, Akalgarh, Mansurpur and Bahadurgarh. The population figures of these towns were 3293, 2816, 2174 and 862 persons respectively in 1891. Significantly, all these urban centres belonged to the princely state of Patiala. On the other hand two 'new' towns, Khanpur and Madhopur with respective population figures of 3183 and 1360 persons, were added to the list at the 1901 census. Thus, both the declassified and the 'new' towns were essentially small-sized rural service centres, and their inclusion in or exclusion from the urban category primarily owed to the courtesy of the Census Superintendent.

Table 1 shows decennial change in the number of urban centres as well as the proportion of urban population in different size-categories of urban centres. Size-Class IV recorded an addition of four towns owing to up-gradation of towns from Class V which, in turn, experienced a decline by four towns. In the other five categories there was only a little change in the number of urban centres

Table - 2
Punjab: Growth of Urban Population (1891-1901)

Population Group	Urban Population		Per cent Growth		
	1891	1901	Unadjusted	Adjusted*	Adjusted**
Total	**904748**	**934766**	**+3.32**	**+4.37**	**+3.87**
Christians	4864	5911	+21.53	+21.93	+20.94
Hindus	368970	375005	+1.64	+2.95	+2.50
Jains	8664	9776	+12.83	+15.19	+15.19
Muslims	446462	467680	+4.75	+5.65	+5.04
Sikhs	75706	76307	+0.79	+1.38	+1.21
Others	82	87	+6.10	+6.10	+6.10

** excluding population of declassified towns.*
*** excluding both declassified and new towns in 1901.*

during this period. It is significant to note that Amritsar remained the only Class I city at both the censuses of 1891 and 1901.

The decade witnessed a rise in the share of population belonging to Class I city of Amritsar from 15.12 to 17.38 per cent (Table 1). Size-classes II to V recorded notable variations in their respective proportions in the state's urban population which was mostly connected with up-gradation and down-gradation of towns from one category to another. However, it is notable that the combined share of population of the upper three categories experienced a nominal decline from 47.11 per cent to 44.02 per cent in the total urban population of the state.

Table 2 shows growth rate of urban population in the state during 1891-1901. Column 4 of Table 2 shows unadjusted growth rate, while that in Column 5 has been obtained by subtracting population of declassified towns from the base year population. On the other hand, growth rate in Column 6 has been worked out by subtracting population of declassified towns from the base year and that of the new towns from the terminal year of the decade. From both the adjusted and unadjusted growth rates in Columns 4 and 6 of Table 2, it becomes clear that among the major religious communities of the state, growth rate of Muslims was distinctly higher than that of Hindus and Sikhs. The inter-religion differential in growth rates was partly connected with continuing conversions to Islam from weaker sections of the Hindus. Besides, the Muslims were only marginally involved in migration to the Lyallpur Canal Colony. On the other hand, the Hindus and the Sikhs in urban Punjab had experienced notable out-migration to that canal colony during the period which was responsible for the very low growth in their urban population. The Christian population had recorded the highest growth rate (21.53 per cent) which was mainly connected with proselytism from lower Hindu strata. As in the previous decade, relatively high growth rate of the Jains (12.83 per cent) stemmed from a perceptible trickle of their rural-urban migration in the state. It deserves mention that the rural Jains were also engaged in trade and commerce.

The population of 35 towns registered a decline during 1891-1901 (Table 3). On the other hand, the growth rate was above 10 per cent in 12 towns, while it was more than 30 per cent in only 2 towns. Thus, the number of urban centres showed a gradual decline in higher growth categories. The same pattern was found in case of the Hindus. The Muslims and the Jains also largely conformed to this picture except that the number of urban centres in above 40 per cent growth category was only 4 in case of the former, and 12 in case of the latter. However, the number of urban centres varied

Table – 3
Punjab: Classification of Urban Centres* by Growth Rate (1891-1901)

Growth rate (per cent)	Number of Urban Centres					
	Total	**Hindus**	**Jains**	**Muslims**	**Sikhs**	**Christians**
40 and above	1	1	12	4	11	29
30-39.99	1	2	1	1	7	2
20-29.99	4	3	2	3	4	1
10-19.99	6	8	3	9	5	2
Below 10	28	19	8	26	11	2
Decrease	35	42	28	32	37	14
No urban population	-	-	21	-	-	25
New Towns	2	2	2	2	2	2
Total	**77**	**77**	**77**	**77**	**77**	**77**

** excluding 2 new towns in 1901.*

Table - 4
Punjab: Change in Urban Sex Ratio (1891-1901)

Population	1891	1901	Change
Total	**798**	**804**	**+6**
Christians	341	411	+70
Hindus	775	775	no change
Jains	887	861	-26
Muslims	854	856	+2
Sikhs	633	680	+47

randomly from one growth category to another regarding the Sikhs and the Christians. Broadly speaking, it can be said that the greater the size of urban population of a community, the greater is the pyramiding of urban centres in different growth rate categories (Table 3).

Changes in Urban Sex Ratio

The decade witnessed a slight improvement in urban sex ratio of Punjab (Table 4). Urban sex ratio was very low at the base year of the decade attributable to male-selective in-migration of officials and army personnel. It is significant to note that there was no change in sex ratio of Hindus, while it was only a nominal increase (+2) in case of Muslims. The highest increase in this regard was registered by Christians (+70) followed by Sikhs (+47). In case of the Christians the increase was the outcome of religious conversions of a significant number of families to this fold, but in case of the Sikhs it resulted from notable inflow of females who came to join the male members already residing in urban places. Having the highest sex ratio among various religious communities in the state, the Jains were the only people who experienced sex ratio decline during this period. A close perusal of Table 4 reveals that there was a strong inverse correlation between urban sex ratio in 1891 and the sex ratio change during 1891-1901.

Population Growth by Size-Classes of Urban Centres

As is often the case with urban growth at

Table - 5
Punjab: Growth of Population by Size-Classes of Urban Centres (1891-1901)

Size-class	Per cent growth			
	Unadjusted	Adjusted (by keeping urban centres as in the base year)	Adjusted (as in Col. 3 minus new towns in 1901)	Adjusted (as in Col. 3 minus both declassified and new towns 1891-1901)
1	2	3	4	5
I	+18.76	+18.76	+18.76	+18.76
II	-29.69	-1.09	-1.09	-1.09
III	+25.34	-1.86	-1.86	-1.86
IV	+42.75	+1.41	+1.41	+1.41
V	-10.24	+3.92	+3.92	+3.92
VI	-1.78	-7.66	-15.13	-0.09
Total	**+3.32**	**+3.32**	**+2.82**	**+3.87**

early stages of urbanization, Punjab's urban population change during 1891-1901 was characterized by wide variations by size-class of urban centres. Unadjusted growth rates as given in Column 2 of Table 5 show that these values varied from 42.75 per cent in Class IV to (-)29.69 per cent in Class II. The highest growth rate in Class IV was attributable to addition of 4 towns to this category at the 1901 census, while decline in population of Class II was attributable to its loss of Firozpur town to the lower size-class. Up-gradation or down-gradation of towns was mainly responsible for wide variations between growth rates in Class III, V and VI. Containing only one city, Amritsar, at both the censuses, Class I population recorded a relatively high growth of 18.76 per cent during this period which was "due to the development of carpet and other factories" (Rose, 1908, p. 16; Gauba, 1988, p. 117) and the existence of big trade-market, particularly in piece goods, grains, and tea (Gosal, 1966, p. 8; Gauba, 1988, p. 81). It deserves emphasis that of the total 30,018 persons added to the urban population of the state during this decennial period, 25,663 persons had migrated to Amritsar city alone. Thus, if this city was excluded from the list of urban centres, then the growth rate of Punjab's urban population would come down to 0.57 per cent only instead of 3.32 per cent.

However, unadjusted figures given in Column 2 of Table 5 do not furnish a realistic picture of population growth by size-classes as these do not take into account the shift of towns from one category to another during the period. Column 3 shows growth rates computed after keeping the towns in the same size-class as they were in the base year census. While retaining the adjustment made in Column 3, Column 4 gives growth rates without population of the new towns in 1901, Column 5 excludes both the new towns in 1901 and the declassified towns from the list of 1891.

Thus Column 5 of Table 5 provides a realistic picture of urban size-class and growth rate relationship during this period. An analysis of this column reveals that there was little connection between growth rate and urban size-categories. The highest growth rate was found in Class I (18.76 per cent) followed by Class V (3.92 per cent) and IV (1.41 per cent). On the other hand, three size-classes i.e. II, III and VI experienced decline in their population with growth rates of (-) 1.09, (-)1.86 and (-) 0.09 per cent respectively.

Concomitant with the slow growth rate of its urban population, Punjab recorded only a slight change in its religious composition during 1891-1901 (Table 6). The Muslims improved their proportion by 0.68 percentage points followed by the Jains 0.09 and the Christians 0.09, whereas there was a decline in the proportion of the Hindus (-) 0.66 and the Sikhs (-) 0.21. Consequent upon proselytism at a perceptible pace during this period, the Christians improved their share of population in all the urban size-classes except Class II which had lost Firozpur town, having a notable concentration of these people in 1891, to Class III. However, other religious communities did not exhibit any distinct format of variation in

Table -6

Punjab: Change in the Proportion of Religious Communities (1891-1901)

Size-class	Christians	Hindus	Jains	Muslims	Sikhs	Change in Diversification Index
I	+0.06	-1.33	+0.23	+1.56	-0.52	0.00
II	-0.49	-0.04	-0.10	+2.62	-1.99	-0.02
III	+1.13	+1.56	-0.47	-2.73	+0.51	+0.02
IV	+0.11	+0.026	+0.05	-2.73	+2.31	+0.02
V	+0.13	-0.70	-0.10	-6.54	-1.59	-0.03
VI	-0.05	-4.10	+1.52	+7.36	+5.21	+0.05
Total	**+0.09**	**-0.66**	**+0.09**	**+0.68**	**-0.21**	**0.00**

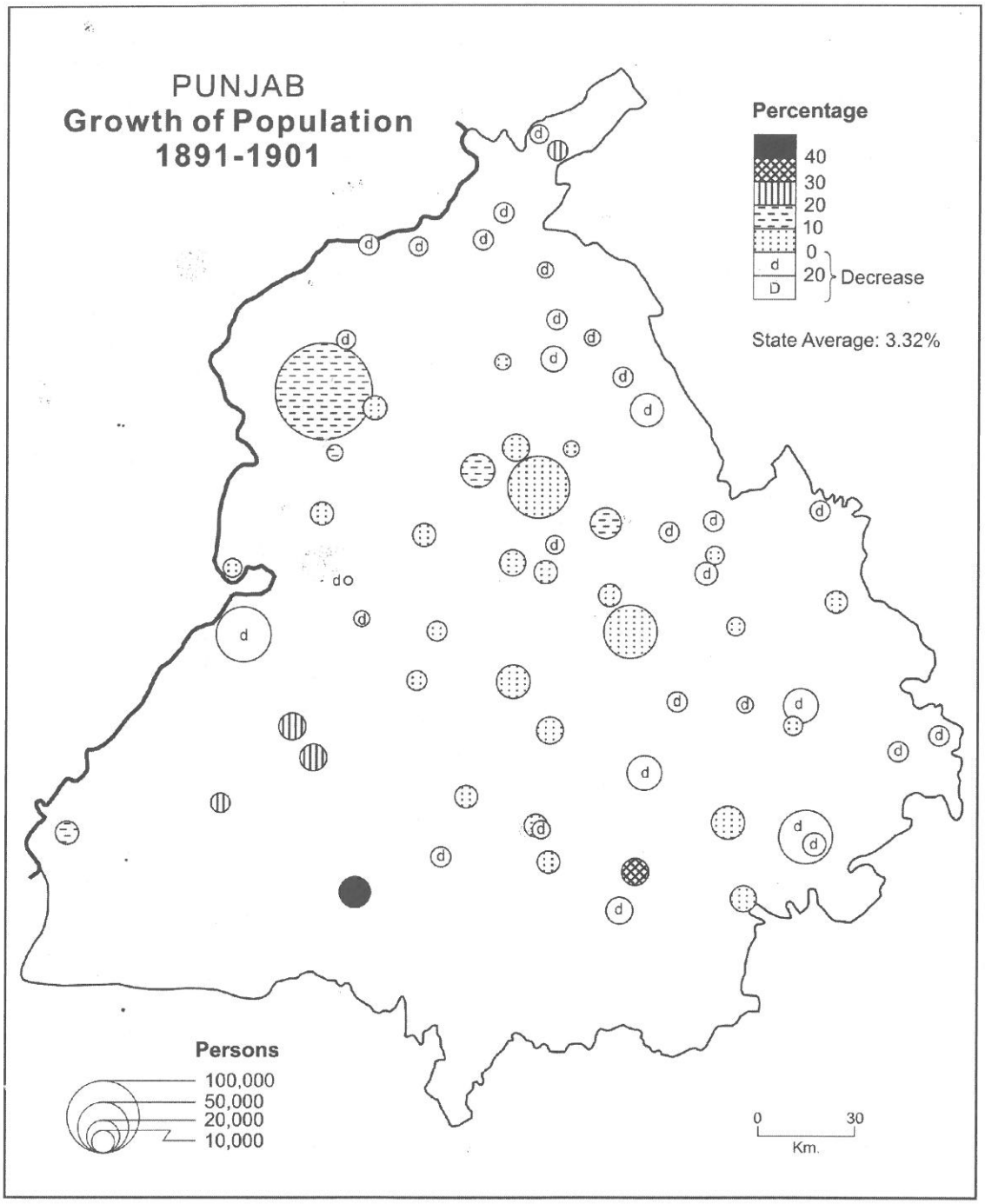
PUNJAB
Growth of Population
1891-1901
Percentage
40
30
20
10
0
d
20
D
Decrease
State Average: 3.32%
Persons
100,000
50,000
20,000
10,000
0
30
Km.

Fig. 1

their respective proportions in different size-classes of urban centres (Table 6).

There was no change in the religious diversification index1 of the state during this period. The same was the case in respect of Class I which included only Amritsar city at that time. The index value a little higher in Class III, IV and VI towns while it decreased in case of Class II and V.

It follows that growth rate of urban centres during 1891-1901 was independent of their size-classes. Spatially random occurrence of fatal epidemics and various types of fevers were important determinants of spatial aspects of urban growth rates during the period. Besides, the construction of railway lines and, extension of assured canal irrigation in some areas were the other important stimulants to urban growth.

Spatial Patterns

Though Punjab's average growth rate of urban population during 1891-1901 was only 3.32 per cent, it was marked by wide spatial variations (Fig. 1). The highest growth rate was recorded in Bathinda (54.46 per cent) while the lowest was found in Rahon (-)18.90 per cent. Bathinda's very high growth rate of population was mainly the consequence of its becoming a major railway node in the area. On the other hand Rahon's heavy decline of population was chiefly attributable to the fact that it had been bypassed by the main arteries of transport at that time. Besides, unhealthiness of the adjoining Satluj flood plain tract had also contributed its share in fostering a decrease in Rahon's population.

Relatively high growth rate of urban population during this decade was mainly found in parts of western Malwa region (Fig. 1). This area had benefited considerably from extension of Sirhind Canal irrigation during the previous decade which had energized its agricultural economy resulting in a higher rate of urbanization. Construction of Bathinda - Firozepur railway line had further encouraged this trend. Bathinda's very high growth rate (54.46 per cent) owed mainly to its nodal position in the emerging system of railway lines as well as to the establishment of a grain market in the town (Rose, 1908, p. 19). Rapid growth of population in Sangrur (34.38 per cent) was attributable to its becoming "the new capital" of Jind state (Rose, 1908, p. 19).

In the northern part of Punjab, Pathankot was the only town which had recorded a relatively high growth rate (28.26 per cent) during this period, while all other towns in that area had registered a declined in population (Fig. 1). Pathankot's position as terminus of Amritsar-Pathankot branch line was the chief differentiating factor in this regard (Rose, 1908, p. 20).

Moderate growth of urban population (10-20 per cent) was registered in Amritsar, Tarn Taran, Kapurthala, Phagwara and Fazilka. As already mentioned, Amrtisar's 18.76 per cent growth rate resulted from the development of carpet and other factories, and the existence of a large trade-market for food-grains and many other items (Rose, 1908, p. 16). Phagwara's moderate growth rate (14.41 per cent) during this period was mainly the outcome of establishment of a large grain-market. Besides, some grain-trade of Jalandhar was also attracted to Phagwara as no octroi was levied in this town (Gosal, 1966, p. 8).

Most of the towns in central Punjab experienced a relatively slow growth of population (0 to 10 per cent) during this period (Fig. 1) which was attributable to the following factors: (i) large scale out-migration of ruralites from these areas to the Lyallpur Canal Colony in West Punjab (now in Pakistan) which had strongly depleted the urbanization potential, (ii) famines of 1896-97 and 1899-1900 further exhausted the pace of urbanization which was especially true of western part of the Malwa region; and (iii) widespread incidence of plague from 1896 onwards raised the mortality rate stifling the natural growth of population.

Almost all the towns in the foot-hill zone of the Majha, Bist-Doab and Malwa region suffered a decrease in population during this period. Poor agricultural economy of the largely choe-infested areas was the main reason for this phenomenon. Besides, the plague mortality was also higher in these areas. Similarly, population decline was the experience of many other towns in the southeastern Malwa region (Fig. 1).

It is significant to note that relatively low growth or decline of population was mainly a characteristic feature of small towns. This was especially true of towns bypassed by the railways which, in turn, had led to a diversion of their trade

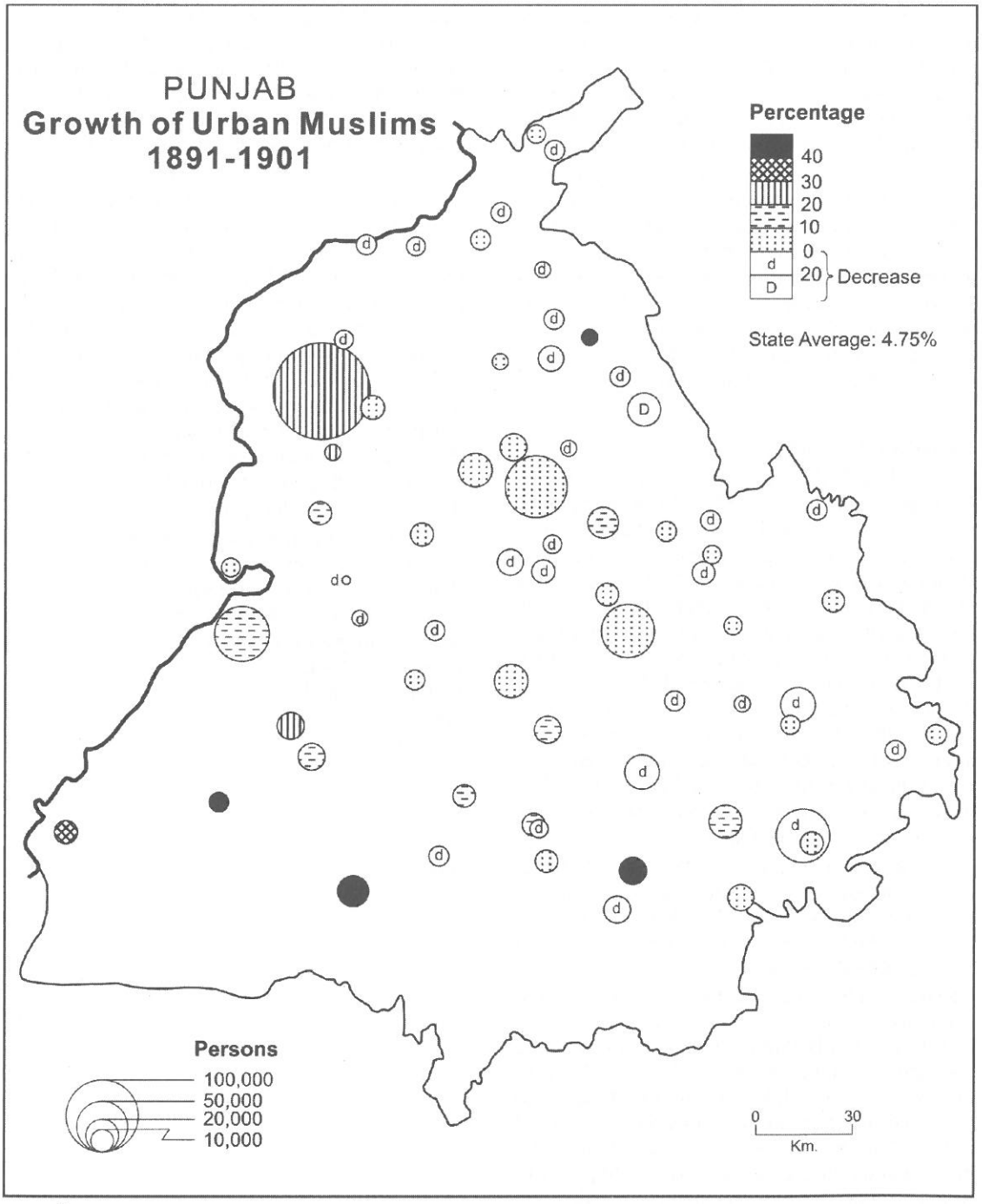
PUNJAB
Growth of Urban Muslims
1891-1901
Percentage
40
30
20
10
0
d
20
D
Decrease
State Average: 4.75%
Persons
100,000
50,000
20,000
10,000
0
30
Km.

Fig. 2

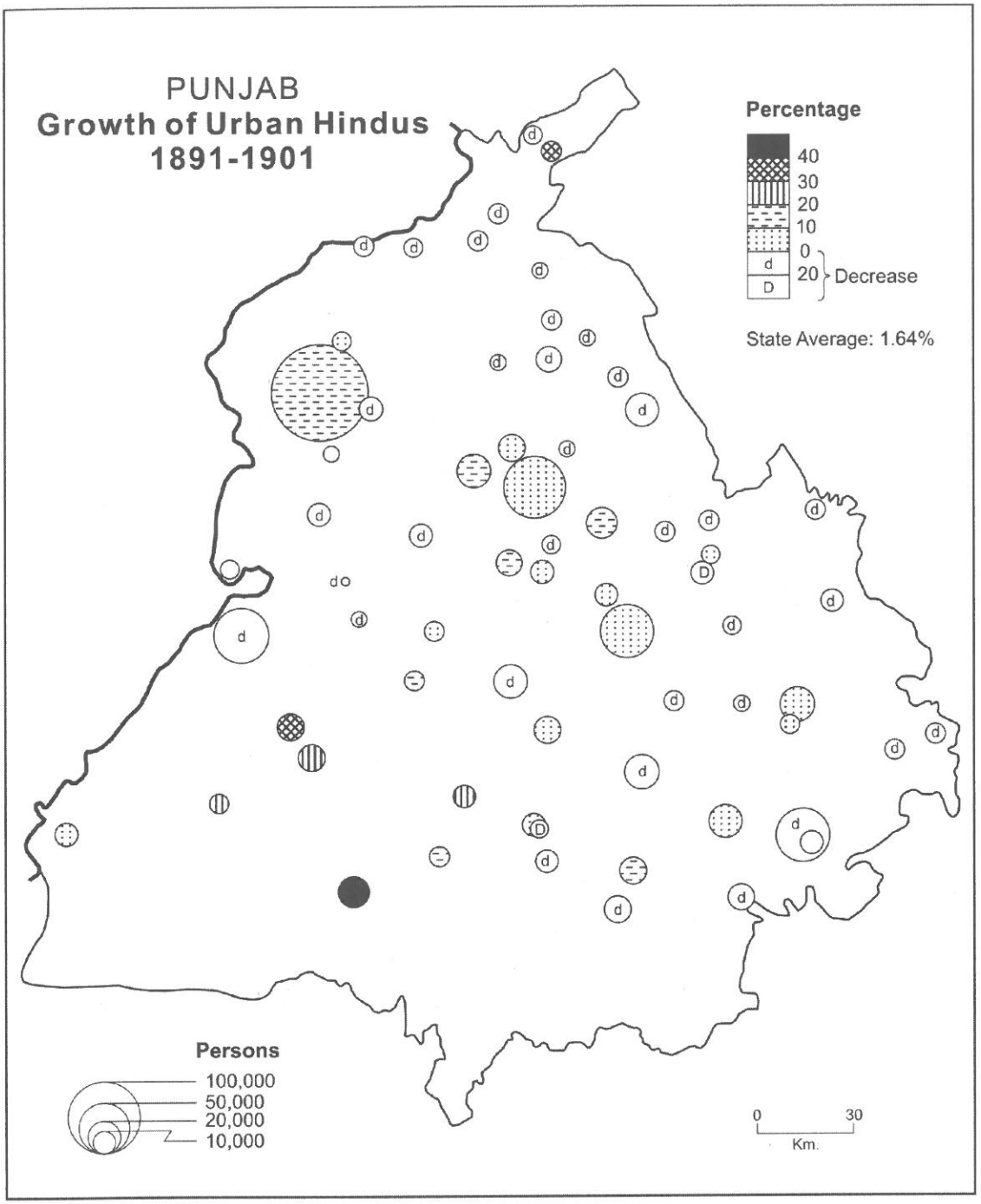
PUNJAB
Growth of Urban Hindus
1891-1901
Percentage
40
30
20
10
0
d
20
D
Decrease
State Average: 1.64%
Persons
100,000
50,000
20,000
10,000
0
30
Km.

Fig. 3

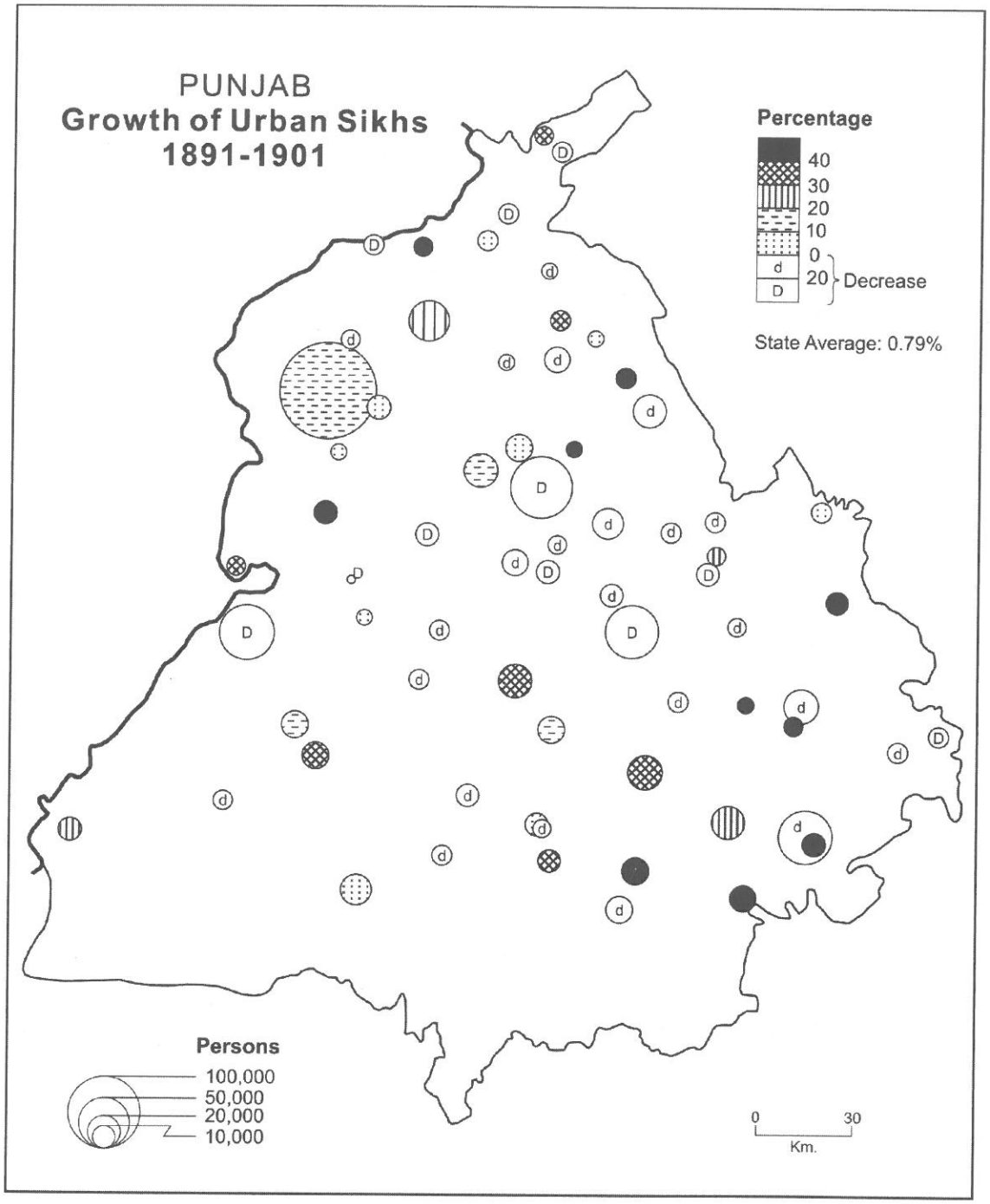
PUNJAB
Growth of Urban Sikhs
1891-1901
Percentage
40
30
20
10
0
d
20
D
Decrease
State Average: 0.79%
Persons
100,000
50,000
20,000
10,000
0
30
Km.

Fig. 4

to more conveniently located places along the railway lines. (Rose, 1908, p. 21).

The spatial patterns of urban population growth of both the Muslims and the Hindus revealed fairly close correspondence to that of the general population (Figs. 2 & 3). The growth rate of the Muslims ranged from 65.11 per cent (Gardhiwala) to (-) 24.25 per cent (Hoshiarpur), while that of the Hindus varied from 72.64 per cent (Bathinda) to (-) 55.06 per cent (Gardhiwala). Thus, the two religious communities did not differ much from each other in their participation in urbanization process during this period.

As in the previous decade the spatial pattern of growth of the Sikh urban population differed notably from that of the Muslims and the Hindus (Figs. 2, 3 and 4). It was attributable mainly to proselytism to this faith as well as to a trickle of in-migration. It is noteworthy that the range of urban population change was much larger in case of the Sikhs i.e. from 750.00 per cent in Samana to (-) 75.32 per cent in Rahon than that for the Muslims and the Hindus. Relatively high growth of the Sikh population in most of the towns of eastern Malwa was particularly noteworthy in comparison to the low growth or even decrease in population of the other two major religious communities. These areas had attracted special attention of the Sikh religious organizations regarding conversions to Sikhism following a fall in Sikh population during the previous census decade (Kaur, 1979, p. 60).

With the state average growth rate of 12.83 per cent, the Jains recorded very wide variations in their urban population growth rates ranging from 3400.00 per cent in Majitha to (-) 100.00 per cent in some towns. Tarn Taran, Sultanpur and Phillaur towns registered Jain population for the first time in 1901. Owing to their very small population in most of the towns at the base year of the decade, the Jain's growth rate not only was marked by wide inter-town variations but it also lacked any characteristic spatiality during this period.

As compared to other religious communities the Christians recorded above 40 per cent growth rate in a very large number of urban centres. Besides, in 1901 Christian population was also recorded in many towns which had none at the preceding census. As in the case of the Jains, the growth rate of the Christians was also marked by large inter-town variations ranging from 4200.00 per cent in Bathinda and in some others e.g., Rampura Phul, Bhadaur, Dera Bassi etc.

Thus, the spatial patterns of urban population growth during this decade in Punjab were mainly chiseled out by the following four factors: (i) rise in agricultural prosperity which in turn was connected with extension of canal irrigation; (ii) extension of railway lines in some areas; (iii) religious conversions; and (iv) the impact of plague epidemic and famines in the second half of the decade. It is important to note that the growth patterns of the two major religious communities of the Hindus and the Muslims had quite close correspondence with each other and also with that of the general population.

Summing up

The decade 1891-1901 recorded very low pace of urbanization in the study area which was mainly attributable to: (i) the stepped up pace of mortality due to ravages of plague and also cholera in some areas; (ii) considerable out-migration to the Lyallpur Canal Colony that sapped up population surplus needed for urbanization; and (iii) low agricultural surplus stemming from occurrence of severe famines.

Among the three major religious communities, the Muslims recorded distinctly higher growth rate which was due partly to their much less involvement in out-migration to the Lyallpur Canal Colony and partly to a trickle of conversions from the Hindu fold. Conversely, the same two factors had resulted in a lower increase of the Hindu population. Relatively low growth rate of the Sikhs was chiefly the result of their heavy out-flow to the Lyallpur Canal Colony. Owing to the accelerated tempo of religious conversions to their faith, the Christians experienced the highest growth rate among the various religious communities. Relatively high growth of the Jain population was attributable to a significant rural-urban migration of this predominantly trading community.

The decade witnessed only a nominal improvement in the urban sex ratio in case of the general population and the Muslims, while there was no change at all among the Hindus. However, owing to notable incidence of male followed by female migration, there was significant rise in sex ratio of the Christians and the Sikhs who had very

low female proportion at the base year of the decade.

As expected the unadjusted growth rates of population showed wide variations from one size-class of urban centres to another. Similarly, if the population of towns added and declassified during this decade is taken out, then the adjusted growth rates reveal little connection with urban size-classes.

Punjab experienced large spatial variations in the growth rate of urban population during 1891-1901. Western Malwa region stood out prominently in having recorded high growth rate of urban population which mainly stemmed from a spurt in its agricultural economy following the extension of the Sirhind Canal irrigation to the this thirsty tract. Besides, the construction of Bathinda-Firozepur railway line had also contributed towards the stepped up pace of urbanization.

Relatively low growth of urban population was a characteristic feature of central Punjab which had not only registered heavy out-migration to the Lyallpur Canal Colony but also suffered notably from the ravages of famines and plague during this period. The foothill zone along with southeastern Malwa tract had also experienced slow growth of urban population owing chiefly to the prevalence of poor agricultural economy as well as the occurrence of plague. It is worth mentioning that slow pace of population growth was a special trait of small towns particularly those which had been bypassed by railway lines.

The spatial fabric of urban population growth of the Muslims and the Hindus was marked by close conformity with growth patterns of general population. However, the Sikhs differed notably from the Muslims and the Hindus in this regard owing partly to the notable incidence of proselytism to this faith and partly to their very low population at the base year of the decade.

In nutshell, the spatial patterns of urbanization in Punjab during this decade were mainly the result of variations in the buoyancy of agricultural economy in some areas, the impact of plague and famines, migration to the Lyallpur Canal Colony and also to other areas in west Punjab. The construction of railways had made their own contribution in this regard. To some extent, the inter-religious differentials in urban growth also reflect the impact of notable incidence of religious conversions in some parts of the state. However, it deserves attention that, as in the previous decades, urbanization during this decennial period also continued to be what Breese (1969, pp. 4-5) called essentially 'subsistence urbanization', i.e., the type "in which ordinary citizen has only the bare necessities, and sometimes not even those, for survival in the urban environment".

Note

The index of diversification is derived using Gibb's and Martin's formula.

$$1-\frac{\sum x^2}{\left(\sum x\right)^2}$$

The index would range from 0 (maximum concentration) to 0.68 (maximum diversity) if there are five variables (population groups by religious affiliation in the present case).

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DEVELOPMENT AND ISSUES OF GENDER INCLUSIVENESS IN HARYANA: 2011

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Abstract

The parameters of development show improvement with economic growth of an area and the same seems to be true in case of Haryana also. However, it has been observed that economic growth on its own does not reduce inequality unless deep rooted systemic challenges are addressed. This inequality remains more sharp and disquieting in case of women under deep rooted patriarchal set up. The present paper attempts to analyse the pattern of inclusiveness of women vis-à-vis development in Haryana. The women inclusiveness has been assessed by taking a number of demographic, educational, health, economic and socio-cultural parameters. The paper is based on secondary sources of data and the results do show overall exclusion of women vis-à-vis the parameters of development and there are regions where this exclusion is more disquieting.

I remember Prof. Gosal as a person of great stature who had immense patience, encouraging young scholars in limited words during Seminars and Conferences. I recall my first direct interaction with Prof. Gosal in an International Seminar on " A Century of Population Change" at Panjab University, in March 2000. My paper was listed for the next day of the 2 days Seminar. Prof . L.S. Bhat chaired the session and Prof. Gosal sat through the whole session, which itself was a great thing for all young researchers like me. After the session, during tea, he congratulated me for the presentation and the words of encouragement still resound. He said, "you have a very good training in statistical techniques and you have nicely used it in your paper". This was a huge encouragement for me. My interaction with Prof. Gosal was limited, but each year his presence in Seminars of Panjab University (which is an annual feature of Deptt. of Geography) and in APG Conference, was so significant that it created an atmosphere of serious academic deliberations. I remember Prof. Gosal as a person of great academic elegance impacting the total milieu, which I am going to miss all through my life.

Introduction

There are commonalities in the challenges faced by women around the world. The difference arises due to varied circumstances in which they live. Some of these are: overwork, age at marriage, son preference, limited choice in decision making, low literacy and education levels and violence against women. The existence of any of these poses immense challenge and if these exist in combination, the struggle of women for equality becomes extremely challenging. It has been observed that economic growth on its own does not remove poverty. It neither improves equality nor

produces jobs unless the deep rooted systemic challenges are addressed. Parameters of development show progress in India, yet one finds groups of people are excluded from development because of their gender, ethnicity, age, disability and poverty. The effects of such exclusion are deepening inequality. Development can be inclusive only when all groups of people contribute in creating opportunities, share the benefits of development and participate in decision making.

Haryana is regarded as the fastest growing economy in India. The growth of GDP in the state during 2012-13 was 6.5 percent which is higher than the all India average of 4.5 percent (Economic Survey, 2014). This vastly superior performance in economy however does not show inclusive development as the marginalized and the women seem to be the left out lot from this development. Economists argue that poverty has reduced in Haryana, but amazingly malnourishment among children has remained same and proportion of anemic women has rather increased as per National Family Health Survey of 2005-06 (IIPS, 2008; Jose, 2008). Further, women work participation has decreased from 27 percent to 18 percent, over a period of ten years, i.e., 2001 to 2011 (Census, 2011). The literacy rate, however, has shown an upward trend, but the crime against women has increased. The percentage of low birth weight babies remains shamefully high despite the fact that the state has retained its position in production of food grains, pulses and milk. Again, the sex ratio remains stubbornly low though the life expectancy has increased. Similarly, one finds exclusiveness of women in health in terms of high maternal mortality and excess female mortality during infancy and childhood. As far as women rights, their dignity and status is concerned, women seem to be living in a paradox of democracy and deprivation which is reflected in retrogressive decisions of *Khap Panchayats* (Kangroo courts) against women in the absence of state control on them. In this context, the present paper examines the inclusiveness of women in the various parameters of development in Haryana, which are indicative of demographic, educational, economic, health and socio-cultural status of women in society.

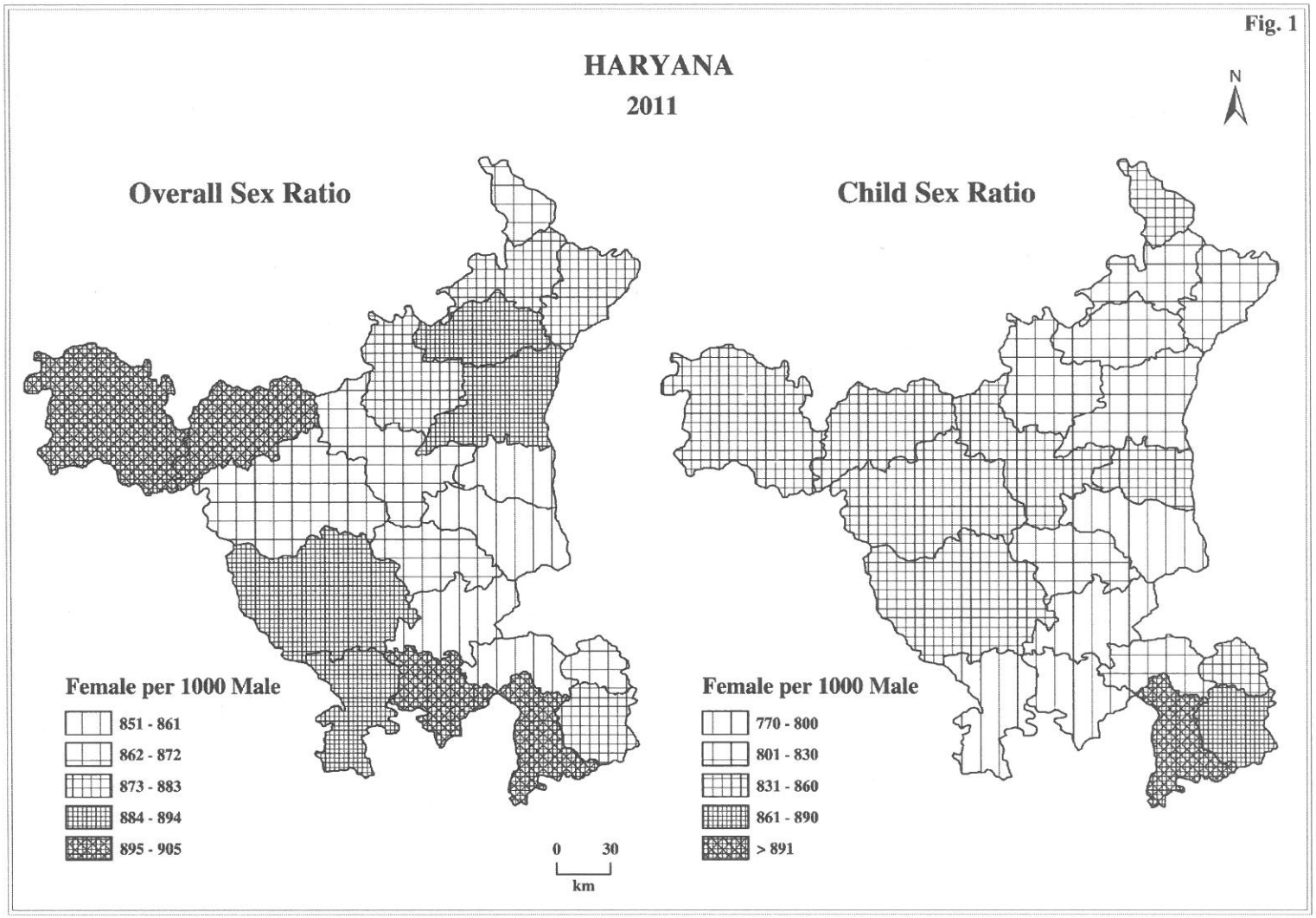
Data Sources and Methodology

The paper is based on secondary sources of data largely derived from Census of India, District Level Health and Facility Survey-3, and National Crime Record Bureau. Demographically five variables have been taken to study the position of women in society. These are: sex ratio among population above six years of age, child sex ratio pertaining to the 0-6 years age group, male-female differentials in mortality under 5 years age group, age at marriage and girls married below 18 years of age. Female literacy and gender gap in literacy rate are two educational indicators used in the present study. Among economic variables, female work participation rate and gender gap in work force participation levels have been taken. Two socio-cultural variables being taken are: crime against women and provision of sanitation facility. Absence of sanitation facility does have a direct bearing on women dignity and her health. Hence, in order to assess this, availability of sanitation facility at household level has been taken into account. Among health related variables, proportion of anemic women and care during child birth, i.e., ante natal care and proportion of institutional deliveries are considered.

Demographic Indicators and Women Inclusiveness

The gender composition of population, i.e. the analysis of sex ratio is becoming more and more curious over a period of time indicating position of women in society. The overall sex ratio in Haryana is 877, against all India average of 933 in 2011 (Census, 2011). It is least among all Indian States and if one includes UTs also, then Haryana's rank is 31 out of 35. Though over the last decade it has shown an increase of 16 points, yet its overall position among Indian states remains the same and shows one step decline if all UTs and states are taken together. The spatial pattern of sex ratio in Haryana has been presented in Fig.1. It shows that 10 districts in the state have recorded sex ratio lower than state's average. It may be noted that all

Fig. 1


HARYANA
2011
N
Overall Sex Ratio
Child Sex Ratio
Female per 1000 Male
851 - 861
862 - 872
873 - 883
884 - 894
895 - 905
0 30
km
Female per 1000 Male
770 - 800
801 - 830
831 - 860
861 - 890
> 891

the districts falling in National Capital Region, namely Sonipat, Gurgaon, Panipat, Rohtak, and Jhajjar, are more vulnerable.

There is no reason to understand what accounts for their shortfall in overall numbers. It is more worrisome when life expectancy of Indian women is rising faster than that of men. The significantly lower sex ratio in the state and also in northwestern India has sent scholars scrambling for explanations. Three popular explanations pervade academic literature : (i) cultural explanations, (ii) discrimination in nutrition amidst falling food availability and increasing poverty, and (iii) differential access to health care amidst lowered health expenditure by the government.

As the Green Revolution in agriculture has been most successful during 1970s in Haryana, one can assume that the paucity of food itself is not a cause of low nutrition and high mortality in the state. Empirical studies show high correlation between low sex ratio and high female and maternal mortality rates in this region (Coale, 1991). Researchers however point out that this shortfall has something to do with the comprehensive subordination of women in the state (Mitra, 1979; Dreze and Sen, 2002). The tendency towards discrimination against women is stronger in northern India. Historically this region has witnessed low sex ratio. Agnihotri (2001) used 1981 census data to show that Aryan kinship systems of the north are more gender biased towards the male child, relative to the Dravidian systems of the south. Das Gupta (1987) has explained the nutritional bias against later born female children as an "extension of the strong preference for male children in Punjab". Excess female mortality and female infanticide has been reported by many researchers. Agnihotri (2001) using 1981 data for disaggregated age groups - 0 to 4 and 5 to 9 and 0 to 9 age group for all districts in India argues that during infancy excess male mortality is mainly biological in nature, while between 1 to 4 age group excess female mortality is largely behavioural in nature. Excess female under 5 mortality leads to significant differences in 0 to 4 and 5 to 9 age group sex ratio. On this basis this study shows 21 districts, forming a large part of Haryana, western UP and northeastern Rajasthan, as having very low female male ratio in 5 to 9 age group, making it a region of high attention. As per 2011 data the sex ratio in 0 to 6 years age group in Haryana is 830, with 11 districts having values lower than the state average. In 4 districts of the state, namely Jhajjar, Sonipat, Mahendragarh and Rewari, it is as low as 774 to 780. It supports the earlier researches which suggest that the relative survival chances of girl child are low in north India due to strong son preference. Given a preference of boys over girls, gender inequality can manifest itself in the form of parents wanting the new born to be a boy rather than a girl. It may also be noted that in none of the districts in Haryana, the child sex ratio is equal to or better than overall sex ratio. The spatial variations in child sex ratio as presented in Fig 1 reveal that only 2 districts, namely Mewat and Palwal, have a child sex ratio of more than 860. In all other districts it is below 850 per thousand boys. It points to the fact that either there has been a fall in female births as compared to male births, or there is excess female mortality after birth. A disaggregated age group wise male-female composition of population (Census, 2011) reveals that not only there is low sex ratio in 0 to 4 age group, but it is more masculine in 5 to 9 and in 10 to 14 ages, which points to sex selective bias in care for survival. Excess female mortality may be further corroborated by the male-female mortality differentials in 1 to 5 years age group as presented in Table 1.

Another demographic variable, age at marriage and percent women married below 18 years of age is considered to study women's position in society. Early marriage may be seen as a indicator of exclusiveness for women as it prevents them from various opportunities in life, the most common are educational, health, economic, or social opportunities. The practice of early marriage not only has adverse consequences on young girls' reproductive health, and many of the meaningful life experiences of adolescence are lost forever. Other than this, it becomes an obstacle in attaining each developmental goal of a civilized society, such as achieving universal primary

Table -1: Haryana : Selected Demographic Indicators (2011-12)

Districts.	Overall Sex Ratio (2011)	Child Sex Ratio (2011)	Mortality Rate* 1 to 5 years		Under 5 Mortality rate* (2012)	Excess female deaths* (2012)	Percent Girls married below 18 yrs**	Mean Age at Marriage**
			Male	Female				
Panchkula	870	850	11.4	21.9	39.9	33	3.4	21.9
Ambala	882	807	20.6	13.4	40.2	Na	2.9	21.7
Yamunanagar	877	825	21.1	27.0	44.5	28	3.8	21.3
Kurukshetra	889	817	14.9	23.2	37.3	67	4.4	21.2
Kaithal	880	821	23.8	34.3	56.5	76	12.8	20.1
Karnal	886	820	13.2	24.5	39.1	154	10.7	20.1
Panipat	861	833	25.8	27.0	53.3	Na	8.9	20.0
Sonipat	853	790	15.9	22.8	36.2	79	4.4	20.0
Jind	870	835	23.9	27.6	52.8	Na	20.2	19.0
Fatehabad	903	845	17.5	25.6	47.8	46	17.2	19.5
Sirsa	896	852	26.0	20.6	52.1	Na	10.1	20.2
Hisar	871	849	18.4	20.1	44.6	Na	25.2	18.8
Bhiwani	884	831	19.8	24.5	46.4	47	20.7	18.9
Rohtak	868	807	25.7	22.5	48.9	Na	9.6	19.7
Jhajjar	861	774	15.4	17.8	35.9	Na	14.5	19.4
Mahendragarh	894	778	22.3	38.1	47.0	79	33.2	18.3
Rewari	898	784	19.1	21.7	39.6	Na	14.2	19.7
Gurgaon	853	826	26.9	39.6	59.4	116	22.4	19.1
Mewat	906	903	43.0	57.1	79.7	202	43.2	17.6
Faridabad	871	842	27.3	38.6	55.6	159	15.3	20.0
Palwal	879	862	27.3	39.2	55.6	100	15.3	20.0
Haryana	**877**	**830**	**22.7**	**29.4**	**49.5**	**N.A.**	**15.9**	**19.7**

Note: (*) refers to the source: U. Ram, P.Jha, F. Ram et al. (2013), 'Neonatal 1-59 months and Under -5 mortality in 597 Indian Districts, 2001 to 2012," The Lancet Global Health, 2013, published online, http//dx.dox.org

(**) refers to: IIPS (2010), District Level Household and Facility Survey (DLHS-3), 2007-08: Haryana, India, Mumbai.

Fig. 2

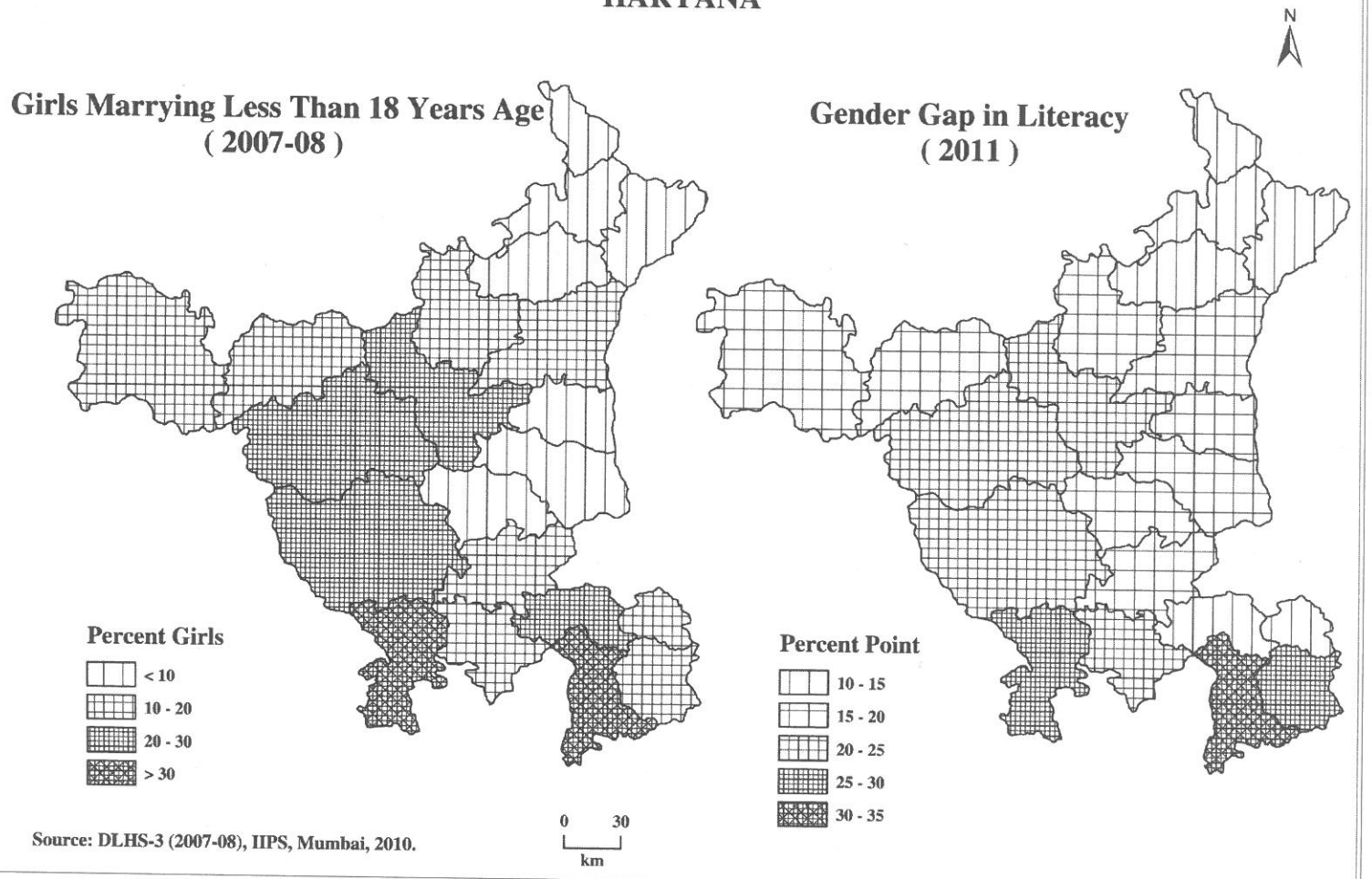
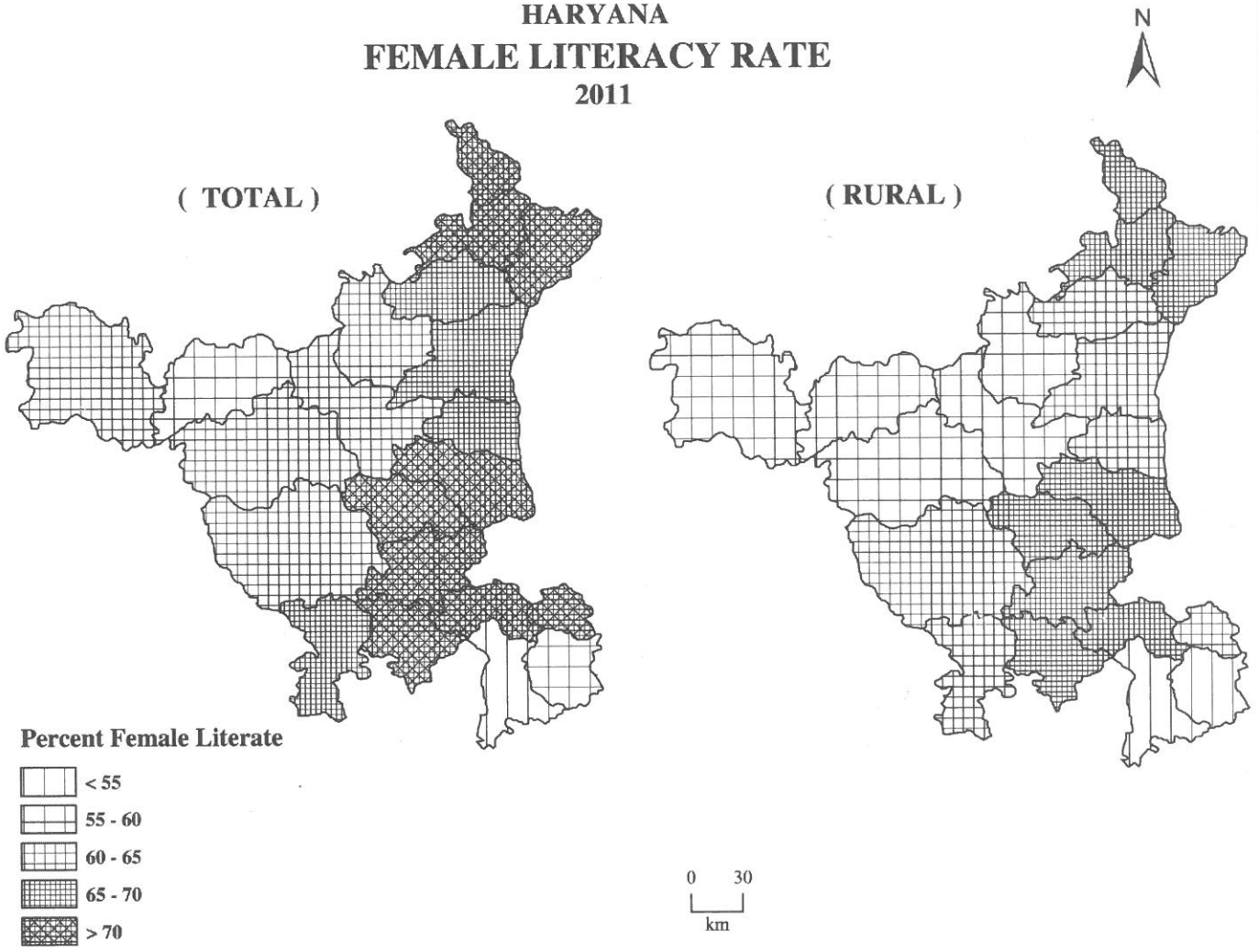

HARYANA
N
Girls Marrying Less Than 18 Years Age
(2007-08)
Gender Gap in Literacy
(2011)
Percent Girls
< 10
10 - 20
20 - 30
> 30
Percent Point
10 - 15
15 - 20
20 - 25
25 - 30
30 - 35
0 30
km
Source: DLHS-3 (2007-08), IIPS, Mumbai, 2010.

Fig. 3


HARYANA
FEMALE LITERACY RATE
2011
N
(TOTAL)
(RURAL)
Percent Female Literate
< 55
55 - 60
60 - 65
65 - 70
> 70
0 30
km

education, promoting gender equality, protecting children's lives and of improving health. It is a well known fact that early marriage leads to many women specific diseases. Girls in this age group are twice as likely to die during pregnancy or childbirth as women in their 20's. It results in low birth weight babies, under nutrition, anemia, low body mass index (BMI) etc. The insularity of adolescence from morbidity gets undermined owing to risks associated with early marriages.

According to Census 2001, the median age of marriage for girls in rural Haryana was 16.9 years, while the overall state average was 18 years (Census, 2001). By 2008, the age at marriage for Haryana as a whole had increased to 19.7 years (DLHS 3) as presented in Table 1, with inter-district differences. However, the age at marriage for rural Haryana is much lower but data for this is not available. Another variable i.e. girls marrying below 18 years (presented in Table 1) reveals that one sixth of girls in Haryana marry below the age of 18. The spatial variations have been presented in Fig. 2. This proportion is about 50 percent in Mewat district of the state. The situation may be worse in rural Haryana, but disaggregated data is not available. Nonetheless, the overall picture shows that in southern Haryana one half to one third of girls get married below the age of 18 years. In Hisar, Jind, Bhiwani and Gurgaon 20 to 25 percent girls are married below the legal age of marriage. Early marriage is seen as a way to provide male guardianship for daughters, protect them from sexual assault, ensure obedience to husband's household. But it is a gross violation of their rights and excludes them completely from the process of development.

Women Inclusiveness in Education and Health

The recognition of female education as a social issue is quite recent in India (Dreze and Sen, 2002). Its expansion may be seen as a positive development. Female literacy has been steadily improving in India as well as in the state of Haryana with an average of 10 percent points during each Census decade. The all India average for female literacy is 65.4 percent while for Haryana it is marginally higher i.e. 66.7 percent. It may be noted that the expansion of female education in the state is not keeping pace with its economic development. The state ranks first in per capita income while in female literacy its rank is 24th in India.

It may also be noted that in female literacy, there are marked inter-district, rural urban and male-female variations. The spatial variations in total and rural female literacy are presented in Fig. 3. In overall female literacy levels, eight districts have less than state average indicating low value attached to their education. In northern districts (namely Ambala, Panchkula, Yamunanagar) and in the districts surrounding Delhi (i.e. Sonipat, Faridabad, Rohtak and Gurgaon) the level of female literacy is higher (70 to 75 percent). In rural areas female literacy levels are much lower with 7 districts having only about half of its females as illiterate. Further, none of the district has less than 30 percent rural women as illiterate. The wide rural-urban gap in female education supports the observation made by Dreze and Sen that the "practical commitment to girl education is not very strong which has links with deep rooted features of gender relations"[1]. There are wide gender gaps in literacy levels as presented in Fig. 2. Only 5 districts may be figured as having a low gap, but here too, this is only around 15 percent. The large gender gap does suggest that female education has been accorded uncertain economic value. Female education can bring immense benefits even within the limited field of domestic work and child rearing - this opinion also needs adequate recognition and campaign in the state.

As far as health of women is concerned, the research reveals that women bear more burden of ill health as compared to men in the state of Haryana in both rural and urban areas (NSSO, 2006; Rajeshwari, 2011). The reality of gender development may be captured by some other very specific health related indicators such as maternal mortality, ante-natal care and institutional deliveries. The all India average in case of maternal mortality is 254 per one lakh women while in Kerala and Tamil Nadu it is 95 and 111 per

Table - 2: Haryana: Selected Socio-Economic and Cultural Indicators (2011)

District	Female literacy*	Rural Female literacy*	Gender Gap in Literacy*	Percent women received ANC**	Percent Institutional Deliveries*	Female Work Participation Rate	Gender Gap in work participation (% point)	Percent rural household having toilet	Crime against women**** (per lakh women)
Panchkula	77.5	67.5	11.1	19.1	64.3	17.8	37.2	44.04	46
Ambala	76.6	69.4	11.9	17.4	55.4	9.8	43.6	51.14	57
Yamunanagar	72.0	65.9	13.1	20.8	52.3	8.3	44.7	46.01	48
Kurukshetra	69.2	64.6	14.3	11.8	64.2	15.0	37.5	69.06	39
Kaithal	60.7	56.1	18.6	21.1	48	16.1	35.1	57.60	36
Karnal	68.3	62.3	15.4	16.6	51.3	14.8	36.8	67.02	45
Panipat	68.2	61.7	17.2	6.2	39	15.0	35.8	66.70	61
Sonipat	70.9	66.4	18.5	14.9	53.7	19.8	30.3	56.20	42
Jind	61.6	57.3	20.9	9.7	42.1	25.0	26.7	51.34	32
Fatehabad	59.3	55.6	18.8	9.5	48.6	23.6	29.6	72.85	31
Sirsa	61.2	56.1	17.4	17.8	53.5	21.6	32.5	87.52	46
Hisar	62.3	56.6	20.5	10.4	48.6	25.0	27.4	62.47	51
Bhiwani	64.8	61.0	22.6	8.9	35	25.1	24.6	49.21	29
Rohtak	71.2	66.1	17.2	27.5	52.8	14.9	33.1	58.43	63
Jhajjar	71.0	68.5	18.4	16.2	48	17.2	31.3	58.47	51
Mahendragarh	65.3	63.0	26.0	9.1	56.8	24.3	23.6	38.98	42
Rewari	70.5	67.0	22.4	20.6	65	24.0	25.6	49.75	45
Gurgaon	77.6	69.1	12.7	27.5	52.3	16.1	36.9	65.61	38
Mewat	37.6	33.7	35.4	1.9	14.8	12.6	26.7	17.81	36
Faridabad	75.2	60.1	14.7	9.3	39.1	12.1	37.2	58.57	54
Palwal	56.4	49.8	26.2	*	*	13.9	29.6	32.30	44
Haryana	66.8	60.0	18.6	13.2	46.8	17.8	32.6	58.07	46

*Source: (i) * Census of India, 2011.*
*(ii) ** (**) refer to: IIPS (2010), District Level Household and Facility Survey (DLHS-3), 2007-08: Haryana, India, Mumbai.*
*(iii) *** refers to National Crime Report Bureau (2012), Crime in India, CRB, Ministry of Home Affairs, Delhi.*

one lakh women. It may be noted that Haryana's MMR has increased from 162 in SRS 01-03 to 186 in SRS 04-06. Haryana and Punjab are the only two states which have shown an increase in MMR (Jose, 2008) indicating poor interventions and good times are not so good for women in Haryana.

Maternal health care package of ante-natal care (ANC) is the main programme of National Rural Health Mission to strengthen reproductive and child health care. The component of this programme is ANC provided by a doctor, an ANM or othr health professional comprises of physical checks, checking the position and the growth of fetus and giving Tetanus Toxide (TT) injection at periodic intervals during the time of pregnancy. At least three check-ups are expected to complete the course of ANC to safeguard women from pregnancy related complications. Institutional delivery and post-natal care in a health facility is promoted in NRHM through the Janani Suraksha Yojana (JSY) to prevent maternal deaths.

The surveys reveal that the state's progress in case of women care during and before child birth during the four year period between DLHS 2 (2002-04) to DLHS 3 (2007-08) has been mixed. The proportion of expectant mothers having received full ANCs has increased from 10.3 percent to 13.2 percent as per DLHS of 2007-08 (Table 2). It may be noted that partial ANC is much higher, but full ANC is necessary to avert maternal mortality and also shows care towards them. Therefore, full ANC has been considered here. The spatial variations have been presented in Fig. 4. It shows that a little over one fourth of expectant mothers take full ANC in Rohtak and Gurgaon districts. In another four districts about one-fifth of women have taken full ANC. This figure is as low as 2 percent in Mewat district and another six districts have less than 10 percent of expectant mothers receiving full ANC, which is disquieting and a matter of great concern.

As far as safety at the time of child birth is concerned, about half of expectant mothers had given birth at hospitals. This has increased steadily from 26 percent in 1998 to 46 percent in 2007-08, a positive intervention and shows a step towards their welfare in case of emergency. Studies, however, reveal a number of factors for this increase and it is indicated that such conscious steps are being taken in order to ensure the birth of a male child (Varghese, *et al.*, 2008). This increase in institutional deliveries however, is marked with wide inter-district disparity. The percentage of institutional delivery ranges from 14.8 percent in Mewat to 65 percent in Panchkula, Kurukshetra and Rewari (Table 2 and Fig. 4).

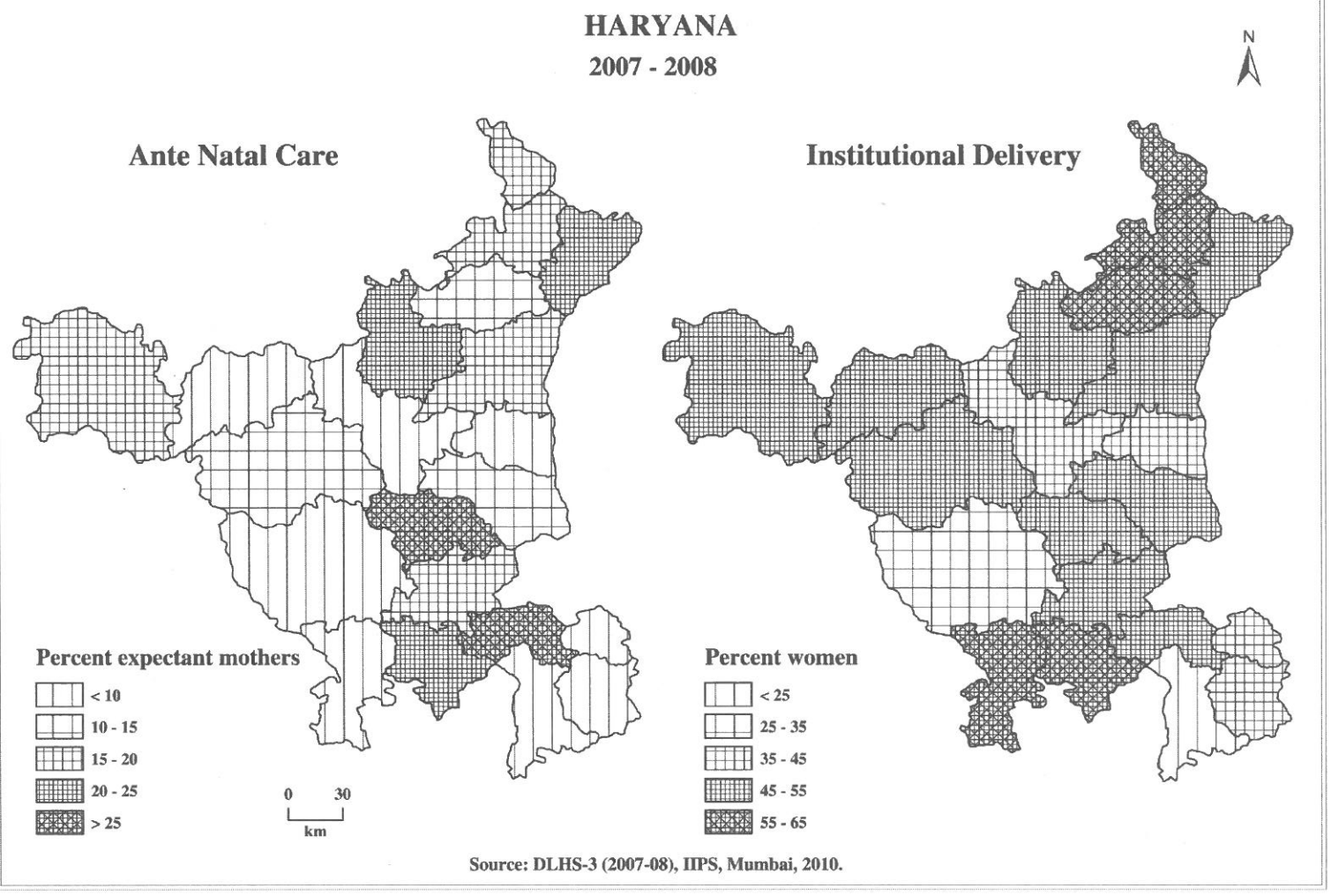
As far as women's inclusiveness is concerned, such a poor performance in ANC and institutional deliveries does reveal the poor outreach of welfare programs in all parts of the state.

Economic Variables and Women

If economic independence is a prerequisite for women's advancement and emancipation then the present pattern shows quite the opposite result for women. In economic participation, gender disparities remain deeply entrenched. The 2012 World Economic Forum on economic participation and opportunity revealed that in terms of Gender Gap Index, India ranked 123rd out of 135 (Ghani, *et al.*, 2013). Women work participation and gender disparity has been captured by taking NSSO data on employment unemployment situation for women. The analysis also shows that women are missing from labour force, there are less work opportunities for women, more of unpaid work and deplorable situation of women in agriculture (Mazumdar and Neetha, 2011; Neetha, 2013).

Despite rapid economic growth, one finds that female work participation rate (FWPR) in Haryana was about 18 percent in 2011 (Table 3). It may be noted that this FWPR shows marked deterioration over 10 year Census period from 27.2 percent to 17.8 percent (Census, 2001 and 2011). The gender gap over this period has also increased from 23.10 percent points to 32.6 percent points. It indicates that women predominantly are sufferer while looking for sustenance livelihood and pushed to marginalization. A further classification of workers suggest that out of these total 17.8 percent workers 9.7 percent are main workers and

Fig. 4



Source: DLHS-3 (2007-08), IIPS, Mumbai, 2010.

Table - 3: Haryana: Structure of Women Work Participation in 2001 and 2011

Year	FWPR	Main Workers	Marginal Workers	Cultivators	Agr. Labourer	HH Industry	Other Workers
2001 (Gender gap)	27.2 (23.10)	13.38 (30.03)	13.84 (-6.95)	44.02	21.16	3.06	31.76
2011 (Gender gap)	17.8 (32.6)	9.7 (33.73)	8.1 (-1.0)	32.78	23.08	3.59	40.55

Source: Census of India (2011), Primary Census Abstract, Directorate of Census Operations, Haryana, Chandigarh

another 8.1 percent are marginal workers meaning thereby that half of these are employed for a short period of time without any security cover. It may be noted that women cultivators have declined substantially meaning thereby that their pauperization has increased. The spatial pattern of FWPR and gender gap in work participation in 2011 has been presented in Fig 5. It shows relatively high participation rate in western and southern Haryana. The low WPR indicates the constraints preventing them from developing their full potential. The shrinking FWPR also hints that either they are less skilled or gender based employment opportunities are shrinking in view of given economic development.

Socio-Cultural Variables

The inclusiveness of women in development process can also be viewed and assessed by various other indicators such as women access to money and credit, role in decision making etc. In the present study two cultural variables viz., (i) violence against women and (ii) provision of basic civic facilities within households, have been considered to study the extent of their suffering. Violence against women is partly a result of gender relations that assume men to be superior to women. Cultural and social factors are interlinked with the development and propagation of violent behavior. Given the subordinate status of women, much of gender violence is considered normal and enjoys social sanction. With different processes of socialisation that men and women undergo, men take up stereotyped gender roles of domination and control, whereas women take up that of submission, dependence and respect for authority. A female child grows up with a constant sense of being weak and in need of protection, whether physical, social or economic. This helplessness has led to her exploitation at almost every stage of life.

The cultural factors and gender relations in Haryana may be witnessed by certain gender -role attitudes which were reported and documented in National Family Health Survey of 2007-08 (IIPS, 2008). The survey reveals that almost half of women in Haryana (46 percent) believe it is justifiable for a husband to beat his wife under certain circumstances. Women are most likely to say that wife-beating is justified if a woman shows disrespect for her in-laws (36 percent) or if she goes out without telling him (31 percent). The survey also revealed that 33 percent of men reported that wife-beating is justified in some circumstances, especially if the wife shows disrespect for in-laws (20 percent) or if the husband suspects the wife to be unfaithful (19 percent). Even among women and men who have completed at least 10 years of schooling, 28-29 percent repoted that a husband is justified in beating his wife for one or more of the specified reasons (IIPS, 2008).

The crimes against women have also continued unabated in case of Haryana as the total number of reported cases of IPC crime against women[2] has almost doubled from 3393 to 6002 between 2001 to 2011 (NCRB, 2012). It may also be noted that a very small proportion of such cases get reported. Table 2 shows crime rate against women per lakh population in various districts of

Fig. 5

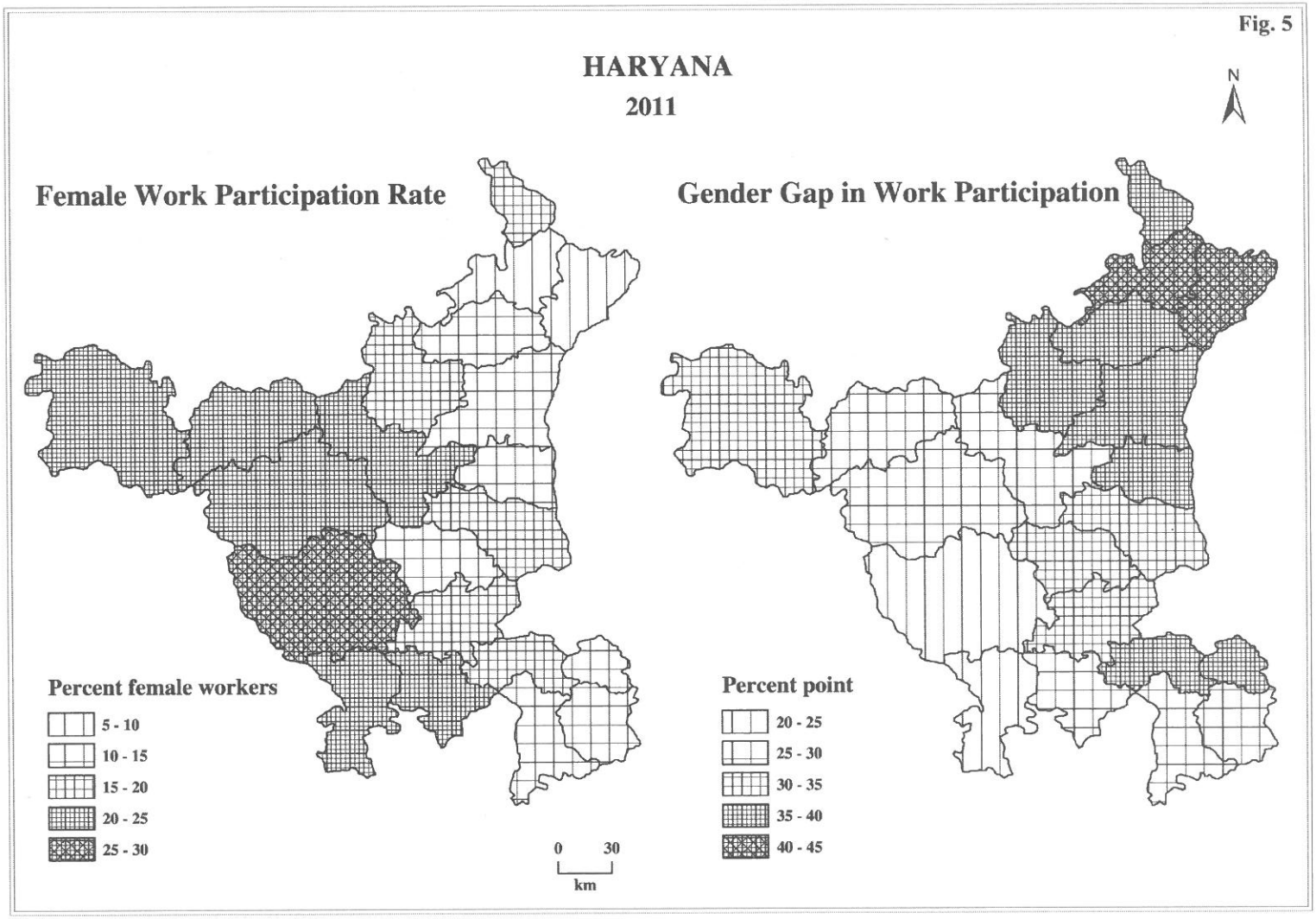
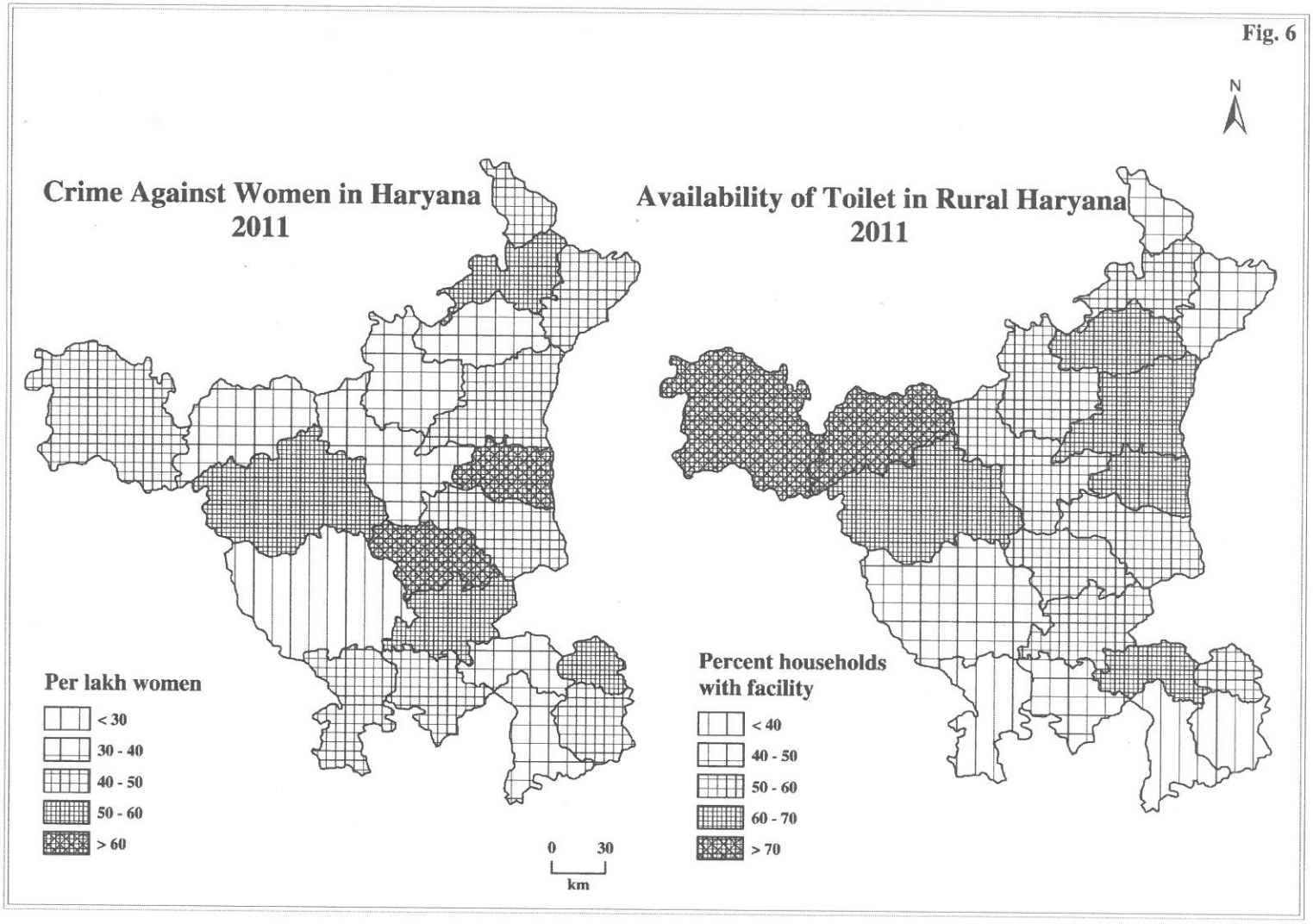

HARYANA
2011
N
Female Work Participation Rate
Gender Gap in Work Participation
Percent female workers
5 - 10
10 - 15
15 - 20
20 - 25
25 - 30
0 30
km
Percent point
20 - 25
25 - 30
30 - 35
35 - 40
40 - 45

Fig. 6


N
Crime Against Women in Haryana
2011
Per lakh women
< 30
30 - 40
40 - 50
50 - 60
> 60
0
30
km
Availability of Toilet in Rural Haryana
2011
Percent households with facility
< 40
40 - 50
50 - 60
60 - 70
> 70

Haryana. The spatial pattern as shown in Fig.6 however, reveals that it is prevalent across districts showing little correspondence with regional differentiation in literacy, gender ratio or availability of any other facility. There are a number of generic reasons which give rise to the dismal picture depicted above e.g., the weak law enforcement and gender insensitivity of the various functionaries and awareness amongst women themselves on their rights also perpetuate violence against them.

Another cultural variable considered here is the availability of toilet facility which is one of the determinants of quality of life. Availability of sanitation facility is linked to women's dignity and their health. The lack of this bare basic necessity puts women to great inconvenience who are under constant threat of various kinds of violence against them. The burden of disease linked to inadequacy of water and sanitation is enormous. Women and children are vulnerable to sanitation borne diseases such as diarrhea, intestinal infection, polio, bacterial diseases and venereal diseases (Rajeshwari, 2008).

In this context, it is interesting to see the percentage of rural households not having toilet facility. The statistics as presented in Table 2 reveal that about 42 percent rural households defecate in open space, having no toilet facility. The spatial pattern in availability of this basic facility in rural Haryana, at household level, has been presented in Fig. 6. It shows that the western districts of the state have better availability of toilet facility, which is largely cultural and also due to concerted efforts in this part of state. The whole of south Haryana shows poor availability of this facility indicating that culturally too, women in this region do not have access to routine basic facilities, and are excluded in the process of development.

Conclusions

The present analysis reveals that certain issues regarding gender inclusiveness are disquieting and a cause of great discomfort. These are excess female mortality in early age groups, adverse male-female ratio, health, hygiene and sanitation, violence, security and dignity of work. Within Haryana there are pockets, especially southern Haryana, which show not only excess female mortality but lack in female literacy, in provision of basic amenities, in their health care, hygiene, sanitation and all related variables. Patriarchy, in this case, works in a dangerous way to undermine women's right to dignified lives. The high prevalence of female feticide and child marriage is a fall out of these factors. The prevalence of son preference is one such reality. Early marriage of girls is seen as a way to provide male guardianship for daughters, protect them from sexual assault, ensure obedience to the husband's household. The region as a whole also seems to be excluded and women remain more vulnerable and the sufferers of sufferers.

In the conventional sense, adolescence is understood to be a period relatively free from morbidity. But this insularity is compromised with marriage and when mothers themselves are immature and do not have full physical development, one can imagine the fate of the entire next generation. Further maternal mortality in the state is also high, not in commensuration with its development. Poverty is increasingly becoming feminised mainly on account of the fact that over a period of time, women work participation has decreased. Their employability and work opportunities have reduced. All kinds of crime against women have increased and traditional patriarchal systems also play their part in keeping women at a lower rung in the social hierarchy by denying them basic rights to fight against these in the absence of state control on illegal social patriarchal institutions like *Khap Panchayats*, which place low value on women's existence. The weak law enforcement and gender insensitivity of the various functionaries fail to check the growing violence against women.

The significant change in women's lives would be possible if implementation of Government programmes is regionally more inclusive and accompanied by more challenging levels of social participation, making it inclusive at each point and fostering behavioural change within the community.

End Notes

1.Dreze and Sen describe 3 such links. These are: (a) gender division of labour which tends to reduce the perceived benefit of female education as they are expected to spend more time for child rearing and in domestic work; (b) The norm of patrilocal exogamy which undermines the economic value of girls education; and (c) The practice of dowry and hypergamous marriage, which turns female education into liability.

2.IPC crime includes 7 types of violence against women. These are rape, kidnapping and Abduction of Women and Girls, Dowry Deaths, Assault on women with intent to outrage her modesty, Insult to the modesty of Women, Cruelty by Husband or his relatives, Importation of Girls from Foreign Country.

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HOUSEHOLD ENERGY SECURITY AND RURAL WOMEN IN INDIA: OPPORTUNITIES AND CHALLENGES

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Chandigarh, India

Abstract

India is hailed among the world's fastest growing economies, with an annual GDP expanding 9 percent. Energy demand has risen in line with the growing economy, making India one of the largest energy consumers. Energy security has always been one of the priority programmes of the Indian government. Energy security refers to energy sufficiency in a country. It usually connotes covering the shortfall in energy requirements but it should essentially address the question of accessibility, affordability and availability of energy sources to different parts of a country as well as varied sections of the society.

This paper in a similar vein examines the opportunities and challenges with respect to availability and affordability of energy sources in India especially in context of rural women who still have to spend major portion of their life in collecting firewood and cow dung for cooking and lighting. The study is based on the Census 2011 data on household amenities where source of lighting (electricity/kerosene) and fuel used for cooking (firewood/dung cakes/LPG) have been used. The analysis has been done only for states as union territories have a very small proportion of rural population. There are regional variations in India as far as far as availability and affordability of energy sources are concerned. States like Punjab, Haryana, Himachal Pradesh, Gujarat, Andhra Pradesh, Karnataka, Tamil Nadu and Kerala have made electricity as well as LPG available and accessible to its rural population. These can be called energy secure vis-à-vis other states, which have been able to provide opportunities to rural women to have access to clean and safe energy sources. On the contrary, states like Uttar Pradesh, Bihar, Jharkhand, Chhattisgarh, Madhya Pradesh, Rajasthan, Gujarat, Karnataka, West Bengal, Odisha, Assam, Meghalaya, Nagaland and Arunachal Pradesh are energy poor. In these states, rural women face challenges of indoor air pollution caused by burning traditional fuels such as wood, dung, and crop residues causing considerable damage to their health as they work in close proximity to these fuels in poorly ventilated kitchens.

Prof. G.S. Gosal was a devoted academician and a committed researcher. His passion for knowledge and pursuit for excellence was evident in his innovative ideas, methodology and lucid style of presentation. This inspired and motivated me the most. He always encouraged the younger geographers to address issues of contemporary societal relevance. Coming from an agriculturist family, rural India was always close to his heart and so were the concerns for rural population. The present piece of writing is my tribute to the great scholar.

Introduction

Ever since the Rio Earth Summit in 1992, sustainable development has been the core concept for creating a world that people can enjoy today and that assures sustainable livelihoods for future generations. A major reason for this is that development requires energy resources, and so far, developing countries have predominantly been locked into fossil-fuel use, and hence energy dependency, economic risk and unsustainable development. (Girardet and Menndonca, 2009). India is no exception. India is both a major energy producer and a consumer. India currently ranks as the seventh energy producer and fifth largest consumer in the world. (Eleventh Five Year Plan, 2008). Despite these achievements, India faces a great challenge of ensuring availability and access to energy sources to more than half of the country's population which does not have access to electricity or other form of commercial energy. Meeting the energy access challenges and ensuring life line supply of clean energy to all is essential for empowering individuals, especially over two thirds of rural women and girls who still have to collect and use fire wood, crop residue and dung cakes for cooking. Provision of clean fuels will not only ensure them a good health but is also essential if growth is to be inclusive.

Defining Energy Security

In the Indian context the Integrated Energy Policy, Government of India (GOI), 2006, defines energy security as "we are energy secure when we can supply lifeline energy to all our citizens irrespective of their ability to pay for it as well as meet their effective demand for safe and convenient energy to satisfy their various needs at competitive prices, at all times and with a prescribed confidence level considering shocks and disruptions that can be reasonably expected."

This definition of energy security brings to the fore the following critical dimensions of energy security for India:

a. Energy up to a certain level called 'lifeline energy' is a basic necessity, and it should be provided to all the citizens.

b. It is desired that safe and clean forms of energy are consumed instead of fuels such as wood or dung cakes, which cause indoor air pollution and thereby negatively impact human health, particularly that of women and children. Provision of cleaner energy fuels such as liquefied petroleum gas (LPG), electricity, and kerosene is regarded as an important step towards ensuring energy security.

c. It is important that energy resources are made available at reasonable prices. The affordability of clean fuels assume importance in the context of the state of economic development of the country, usage pattern of energy, and market forces in achieving security.

d. Energy security refers to energy sufficiency in a country. It usually connotes covering the shortfall in energy requirements but it should essentially addresses the question of availability, accessibility and affordability of energy sources to different parts of a country as well as varied sections of the society.

In view of ensuring minimum level of energy or lifeline energy to all citizens of India, the national policies lay special focus on providing energy security at the household level being the largest energy consumers. By this token, household energy security means assured and regular supply of clean energy fuels such as LPG, electricity, kerosene at affordable prices for various household activities (Jain, 2010). In order to have an effective approach in addressing the issue one needs to differentiate between the energy security of rural and urban areas because energy dynamics of both the areas are quite different. Energy security perhaps is more important for rural households because they are more vulnerable, and marginalized in this respect as they lack access to clean fuels and largely depend on traditional fuels like fuel wood and dung cakes to meet their energy requirements, supplemented by

small amounts of kerosene and electricity for lighting. Further, the burden is largely borne by rural women who are caught in the web of energy poverty because they still have to spend major portion of their life in collecting firewood and cow dung for cooking and lighting. The United Nations Development Programme defines energy poverty as the inability to have an access to modern cooking fuels and the lack of bare minimum of electric lighting to read or for other productive activities at sunset.

Objective

This paper in a similar vein examines the opportunities and challenges in terms of availability and affordability of energy sources in India especially in context of rural women and raises some concerns for policy planning.

Data Base and Methodology

The present study has operationalised the definition of Government of India cited above. The study is based on the Census 2011 data on household amenities where source of lighting (electricity/kerosene) and fuel used for cooking (firewood/dung cakes/LPG) have been used as indicators of household energy security. The availability of electricity (more than 55 percent rural households) and LPG (more than 11 percent) have been taken as criteria for classifying a state as energy secure or poor. These threshold values represent national averages for both the indicators. Further, the data on poverty estimates by Planning Commission of India has been pressed into service for addressing the issue of affordability. The analysis has been done only for states as union territories have a very small proportion of rural population. The underlying assumption is that energy secure states have been able to translate these policies in creating opportunities for rural women for using clean fuels unlike energy poor states where women face challenges of using traditional sources of energy.

Results and Discussion

OPPORTUNITIES AND CHALLENGES

1. *Availability*

Rural India exhibits a higher dependency on traditional sources of energy. Census 2011data shows that 85.5 percent of rural households used firewood/crop residue and dung cakes, 62.5 percent of rural households used firewood, 11 percent used dung cakes and 12.3 percent used crop residue for cooking. Only 11 percent of the rural households used LPG in their kitchens. This clearly indicates the higher share of traditional household fuels in the energy basket of Indian rural households and exhibits lower levels of energy security at the household level.

Further, the access to clean fuels for lighting is also very limited. Only 55 percent of rural households use electricity for lighting whereas 43.2 percent use kerosene as per Census 2011. It seems that the penetration of cleaner fuels such as electricity is still sluggish in rural areas.

If we examine the regional patterns of rural energy security we find that by and large the developed states have been able to ensure availability and accessibility of energy sources to their rural population thereby creating opportunities for women to use clean fuels for lighting and cooking. In fact, development cannot take place without access to clean and affordable energy sources (Clancy, 2011). Further, development enables people to aspire to move beyond the very basic existence and climb up the energy ladder which has the traditional sources of energy on its lowest rung and kerosene in next rung while LPG and electricity is placed in the highest rung. States like Punjab, Haryana, Himachal Pradesh, Gujarat, Andhra Pradesh, Karnataka, Tamil Nadu and Kerala have made electricity as well as LPG available and accessible to its rural population. These can be called energy secure vis-a-vis other states (Table 1 and Fig. 1). These are the states which have been able to translate their policies in creating opportunities for rural women. In comparison, the energy poor states are those where majority of rural women still use traditional

Table - 1: Rural India: Availability and Affordability of Electricity and LPG for Lighting and Cooking, 2011

Sr. No.	State	Percentage of Rural Households having		
		Electricity	LPG	Percentage of Population below poverty line
Energy Secure States				
1	Arunachal Pradesh	55.5	12.9	17
2	Goa	95.6	59.5	1.9
3	Andhra Pradesh	89.7	2.62	7.5
4	Gujarat	85	14..3	13.9
5	Haryana	87.2	24.5	9.2
6	Himachal Pradesh	96.6	32.7	7.2
7	Jammu and Kashmir	80.7	16.3	2.7
8	Karnataka	86.7	10.9	12
9	Kerala	92.1	24.7	9.6
22	Maharashtra	73.8	17.9	22
10	Manipur	61.2	16	17
11	Mizoram	68.8	17.9	17
12	Punjab	95.5	38.9	5.9
13	Sikkim	90.2	24.2	17
14	Tamil Nadu	90.8	28.6	24.2
15	Uttarakhand	83.1	29.4	31.7
Energy Poor States				
16	Assam ***	28.4	9..9	17
17	Bihar ***	10.4	3.4	32.9
18	Chhattisgarh**	70	1.6	31.2
19	Jharkhand***	32.3	1.9	40.2
20	Madhya Pradesh**	58.5	3.5	29.8
21	Meghalaya**	51.6	2.6	17
23	Nagaland**	75.2	6.7	17
24	Orissa***	35.6	3	39.8
25	Rajasthan**	58.3	7.7	14.3
26	Tripura**	59.5	5..3	16.9
27	Uttar Pradesh***	23.8	6.4	25.3
28	West Bengal ***	40.3	3.9	24.9
	INDIA	**55.3**	**11.0**	**21.80**

* - *Energy poor on account of Electricity*
** - *Energy poor on account of LPG*
*** - *Energy poor on account of both*

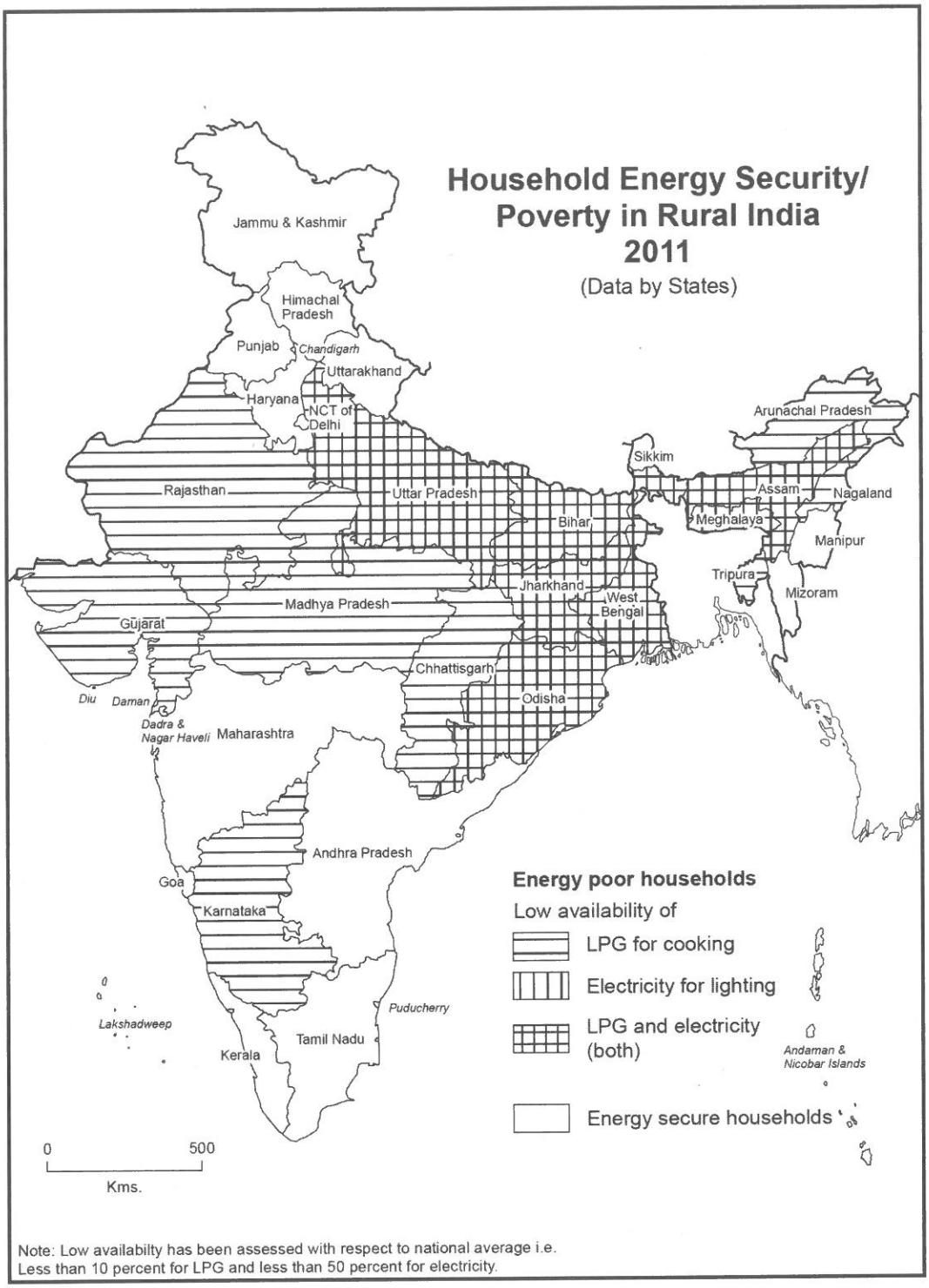
Household Energy Security/
Poverty in Rural India
2011
(Data by States)
Jammu & Kashmir
Himachal Pradesh
Punjab
Chandigarh
Uttarakhand
Haryana
NCT of Delhi
Rajasthan
Uttar Pradesh
Bihar
Sikkim
Arunachal Pradesh
Assam
Nagaland
Meghalaya
Manipur
Tripura
Mizoram
Jharkhand
West Bengal
Madhya Pradesh
Gujarat
Chhattisgarh
Odisha
Diu
Daman
Dadra & Nagar Haveli
Maharashtra
Andhra Pradesh
Goa
Karnataka
Puducherry
Lakshadweep
Tamil Nadu
Kerala
Andaman & Nicobar Islands
Energy poor households
Low availability of
LPG for cooking
Electricity for lighting
LPG and electricity (both)
Energy secure households
0
500
Kms.
Note: Low availabilty has been assessed with respect to national average i.e.
Less than 10 percent for LPG and less than 50 percent for electricity.

Fig. 1

sources of energy for cooking and lighting. In these sates either the availability of electricity is poor (less than 55%) in rural households or reach of LPG as cooking fuel (less than 11%) is lower or the states are poor on both the counts. Such states are Uttar Pradesh, Bihar, Jharkhand, Chhattisgarh, Madhya Pradesh, Rajasthan, Gujarat, Karnataka, West Bengal, Odisha, Assam, Meghalaya, Nagaland and Arunachal Pradesh (Fig. 1). In these states less than half of the rural households have access to electricity and/or less than one-tenth of rural households have access to LPG for lighting and cooking respectively. Undoubtedly, women in these states face challenges on account of use of clean fuels. Somehow, it appears that the power generation capacity of a state does not seem to be linked to availability of power to rural households. For example, even though Jharkhand is a "power surplus" state, around 68 percent rural households have no electricity. Possibly, less priority to rural areas has technical and economic reasons like high cost of supply and maintenance, payment default, electricity theft, poor infrastructure etc., which make electrification of villages unviable (Bhattacharya, 2005).

2. *Affordability*

The issue of affordability has been looked at by making use of data on population below poverty line. There are regional variations in India as far as the distribution of rural poor is concerned. In Jharkhand (40.20 percent) the proportion of rural poor is forty times more than that of Goa (1.90 percent). This makes the issue of affordability more crucial because it determines the reach of clean/ traditional energy resources to a household.

Unfortunately, the energy poor states are also trapped in the web of economic poverty. The data on population below poverty line indicates that the energy poor states like Jharkhand, Odisha, Bihar, Chhattisgarh, Uttar Pradesh, West Bengal, Assam and Meghalaya have substantial proportion of rural population living below poverty line (Table 1). In these states, women juggle household budgets to ensure that they have enough cash for candles and kerosene. In these conditions households respond to energy shocks by either shifting to using cheaper energy sources or reduce non-energy expenditure (such as withdrawing children from school, eating fewer cooked meals and even skipping meals). All these findings have their own manifestations and policy implications.

At the micro level, there has been a growing recognition of the role that energy can play in combating poverty through improved health, especially of women, by using cleaner fuels. This in turn will also increase her productivity and create new opportunities for additional income as time spent on collecting fuel wood and dung cakes can be gainfully utilized. Recently, in Gujarat project URJA in 2006 was launched and micro-loans were given to women to enable them to buy solar power lanterns and smokeless gas stoves. The dividends of the project are very encouraging. The women have not only been facilitated in their household chores but also have been able to supplement family income by gainfully engaging in other activities like selling vegetables and opening of tea stalls. We need to replicate such efforts in other states of India as well.

Gender Concerns

The condition of rural women in the energy poor states is pathetic. Not only the thermal (energy) efficiency of the traditional resources used for cooking is low (15%) but also particulate matter is much higher (2000ug/cub m) than the permissible limits (150ug/cub m). Further, use of traditional fuel is estimated to cause around 4 lack pre-mature annual cases of various respiratory problems. Indoor air pollution caused by burning traditional fuels such as wood, dung and crop residues causes considerable damage to human health, particularly that of women and children as they work in close proximity to these fuels in poorly ventilated kitchens. As per the statistics of Survey of Causes of Death in Rural India (2004) Bronchitis and Asthma (7.7%), Pneumonia (4.7%) and tuberculosis of the lungs (14.2%) have been identified as leading causes of death among women in rural India. Further, higher prevalence

rates of theses diseases have been reported from Uttar Pradesh, Madhya Pradesh, Odisha and Rajasthan which are energy poor and haven't been able to make clean source of energy available and accessible to their rural women.

Indoor air pollution, which involves exposure of household members to toxic emissions from cooking and heating activities, is the third highest health risk to humans. Studies undertaken indicate that exposure to biomass smoke or indoor air pollution is associated with chronic bronchitis, tuberculosis, cataract, and acute respiratory infections (ARI). In fact, ARI is the largest single disease category among children in India accounting for about 4,00,000 deaths at the national level annually, of which 90 percent occurs in children below the age of five. It is estimated that 11 million years of healthy life of women and children are lost every year due to health effects of cooking stoves based on solid fuel that releases many pollutants (Ramanakumar and Aparajita, 2005).

The high dependence on traditional and polluting sources of energy has adverse social and economic implications attached to it. Long hours and big efforts spent in just gathering fuel wood give women little time for gainful activities. One can't assume that women will always use any acquired free time for income generating activities nor it is culturally acceptable to all women to work outside the home. The use of clean fuels increases possibilities for women to participate in the labour market and income generation activities which are considered more valuable to the household than using women's labour and time to collect firewood. It would be appropriate here to discuss the most celebrated success stories in the area of access to rural energy: Gramin Shakti. This is the branch of Gramin Bank in Bangladesh dealing with renewable energies and their work centres on empowering rural people through access to green energy and income. Gramin Shakti supports programmes of various energy technologies including wind, bio-gas, cooking stoves and offers training and capacity building as well as entrepreneurship courses for women through Gramin Technology Centres (Gramin Shakti, 2012). Such programmes give the rural people, especially women, a chance to improve their quality of life and also take part in income generating activities. Such programmes also help to break the social and economic divide between those who have energy and those who do not. This could be a replicable model for India.

In India also, in fact, gender plays a significant role in household energy security. In non-monetised fuel markets, where bio-mass is within 'easy-reach' of the home, household energy security is generally women's responsibility. However, as biomass becomes scarce, and it's sourcing takes longer, there is a shift towards men's involvement in fuel collection, particularly where the use of mechanised transport is required or where there are social restrictions on women's movement outside of the household. The same occurs when households move towards the use of commercial fuels, men are involved in the adoption decision and, indeed, may actually make the final decision. To purchase fuels and any new conversion technology, as well as paying for repairs, including those used in what might be considered the 'woman's domain' of the kitchen. Measures taken to improve household energy security therefore need to consider men as well.

Conclusion

India faces a major challenge to ensure equitable access to clean energy sources for rural households. There are still twelve energy poor states where rural women still have to face challenges and hardships as far as use of clean sources of energy are concerned. Given that the rural households generally have a limited capacity to pay; the private sector often sees no financial incentive to provide services in such a scenario. NGOs do step in to provide access to cook stoves and biogas but they do not have the organizational capacity and access to the necessary levels of finance to deliver to rural population at large. State enterprises can only play a role in ensuring reach of clean fuels to rural population thereby creating

opportunities for rural women and empowering them to overcome challenges being faced presently.

At the household level, promoting energy efficiency is challenging because of high costs involved in it. However, improving energy security and affordability for rural poor requires political commitment especially willingness to allocate resources. Countries like China, Indonesia, and Cambodia have successfully promoted the use of clean cooking fuels and have given respite to their women. Indian policy makers need to be motivated to make the right decisions in terms of household energy security and affordability to ensure the poor in general and women in particular to come out of the web of energy poverty. The energy security of households can be best served by ensuring women's well being and improved life chances through energy services that provide improved health and education and enable their economic empowerment. Above all, in drafting any policy on energy security, gender concerns should be incorporated. The government must consider how it affects the women as it is the mother, wife, and daughter who provide the energy needed for the family.

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A COMPARATIVE VIEW OF QUALITY OF LIFE OF NON-SCHEDULED CASTES AND SCHEDULED CASTES IN HARYANA

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Abstract

An attempt has been made in comparative terms to find the quality of life of non-scheduled castes and scheduled castes in Haryana. Data made available by the recent 2011 Census of India has been put in service. The quality of life which is contingent upon economic wellbeing, social equity and access to modern facilities among other things has been examined in terms of a set of three main indicators - economic wellbeing, status of women and modernization level for both segments of population. The study reveals that non-scheduled castes enjoy a better quality of life as compared to their counterparts in the state. They were way ahead of the scheduled castes on the count of modernization level, quite close on economic wellbeing and lagged behind on status of women. At district level, the overall quality of life of both communities was quite high in Panchkula district bordering the state capital, Chandigarh, and Gurgaon and Faridabad districts adjoining the national capital, New Delhi, as compared to southern districts of Mahendragarh, Palwal and Mewat. The non-scheduled castes within Panchkula, Gurgaon and Faridabad districts were way ahead than the scheduled castes in terms of quality of life. In Mahendragarh and Palwal districts the difference in the quality of life of non-scheduled castes and scheduled caste was quite narrow but again it was in favour of non-scheduled castes. The correlates of the quality of life of non-scheduled castes and scheduled castes reveal the pre-eminence of the factor of urbanization followed by per capita income and percentage of non-agricultural workers in rural areas. The scheduled caste population displas a lower degree of quality of life in areas of its heavy concentration.

Professor G. S. Gosal, highly satisfied with the quality of life he lived, had the democratic skills to ensure the involvement and participation of his colleagues in identifying the strategies that he wished to improve their quality of life. He believed that development cannot simply be reduced to growth in income. Instead he viewed it as a much broader process that improves the opportunities and quality of life for individuals.

Introduction

Quality of life is the product of the interplay among social, health, economic and environmental conditions which influence human and social development. One way of approaching quality of life measurement is to gauge the extent to which people's happiness requirements are met. Geographic areas that provide easy access to a variety of amenities of modern living including

schools, parks, open spaces, health institutions, sanitation, electricity and other modern facilities of convenient public transportation promote happiness. Level of material prosperity displayed in the possession of different kinds of modern amenities enjoyed by individuals, a specific demographic group, or a geographic region displays the level of quality of life and well-being of the people as these contribute to their physical and material comfort.

World Health Organization (WHO) has defined quality of life as the condition of life resulting from the combination of effects of a range of factors such as determining health, happiness, education, social and intellectual attainments, freedom of action, justice and freedom from oppression. United Nations Development (UNDP) has devised a composite index called Human Development Index (HDI) to measure quality of life by using three indicators of life expectancy, literacy and income. Human development by UNDP is a process of enlarging the choices for all people and not just for one part of the society (Thakur, 2011, p. 32). A variety of life domains such as housing, health or social relations are included to assess the quality of life.

Quality of life, thus, is a strong indicator of a household's access to assets and amenities. *Pucca* house provides significant economic security and dignity in society, use of liquefied petroleum gas (LPG) for cooking reduces the time women spend in fuel collection, thereby reducing domestic labor and increasing time devoted to other activities, electric lights enable more reading time thereby helping in achievement of higher education standards, clean water and sanitation reduces the prevalence of a variety of water born diseases and motor vehicles and use of internet facilities strengthen the household's connection to the country as a whole. While these amenities improve the quality of life, they also demonstrate that the household has succeeded financially. Thus, in modern life, household possessions of these amenities are both the sign of social status and instruments for leading better quality of life (NCAER and University of Maryland, 2015, p. 60).

Traditionally Indian society has been divided into different segments based on religion, caste and tribe. Despite many efforts the caste system has existed for centuries. These social divisions based on caste, tribe and ethnicity have led to substantial inequalities in education, employment, and income levels. The castes traditionally have been associated with different kinds of occupations depending upon their social status. Brahmans were ranked quite high, farmers and artisan groups, such as potters, barbers, and carpenters were middle rank societies while leatherworkers, butchers, launderers, and latrine cleaners were ranked quite low. Scheduled castes traditionally have been assigned tasks which involved physical contact with filth and organic wastes. Based on their caste, people could access different kind of amenities which led to different kind of prosperity, thereby impacting upon their quality of life.

In the equity perspective everyone has an equal right to live a decent life irrespective of caste but in reality inequality is a persistent phenomenon in everyday life of people especially those belonging to different caste groups in India. To bridge the gap between different segments of society, at all India level, provision of amenities is imbedded in the planning process itself which is undertaken with the purpose of uplifting development of overall population, specifically targeting different segments of population. Socially disadvantaged groups including scheduled castes have received special focus over the years for their social and economic advancement to provide them a decent quality of life. For the wellbeing of these communities, special target-oriented programmes are being implemented by earmarking funds and providing subsidies enabling them to have access to different kind of amenities. The rationale behind such targeted policy decisions is to uplift the quality of life of scheduled castes in the country.

According to Census of India 2011,

scheduled castes constitute 16.6 per cent of the total population of the country. The proportion of scheduled caste population was highest in Punjab (31.9 per cent) and lowest in Mizoram (0.1 per cent). Haryana with 20.2 per cent of scheduled caste population was ranked fifth in the country. The scheduled castes in Haryana have constituted a significant demographic strength since its formation in 1966 as a separate state after trifurcation of erstwhile Punjab. In the year 1971, the scheduled castes population in Haryana was 1,895,933 which constituted 18.9 per cent of the total population of the state. According to the Census 2011, the scheduled caste population in the state was 5,113,615 persons, constituting 20.2 per cent of state's total population. Scheduled caste constituted 22.5 per cent of the rural population and 15.8 per cent of the urban population in the state. This segment of population is essentially rural oriented as 73 per cent of them live in rural areas and the rest 27 per cent in urban areas. The scheduled caste population in the state was growing at a much faster pace than their counterparts in the state. The scheduled caste population in the state grew at a compound annual growth rate of 2.5 per cent during 1971-2011 which was higher than the growth rate of non-scheduled caste population at 2.3 per cent per annum. As a result of this, the scheduled caste population in the state increased by 2.7 times during 1971-2011 and non-scheduled caste population increased by 2.5 times during the same period. The scheduled castes in the state have registered lower literacy rates than the rest of the population.

Apart from the native scheduled caste population a large number of them have migrated to the state from other areas in search of employment. The scheduled castes, being economically weak and forced to reside at peripheral locations in the state, have often been devoid of basic amenities of housing, education, safe drinking water sources, clean living environment, education and health facilities impacting upon their quality of life. The persisting economic conditions due to combination of a variety of factors are likely to make it difficult for them to avail of avenues of decent living. In this context, the present paper is an attempt to examine the levels of quality of life of non-scheduled castes and scheduled castes reflected in the three components of (i) economic well-being, (ii) status of women, and (iii) degree of modernization.

Objectives

Quality of life is contingent upon economic wellbeing, social equity and access to modern facilities among other things. That is how quality of life among the non-scheduled castes and scheduled castes segments of population has been captured in this analysis covering all the districts of Haryana. The paper examines the disparities in the relative quality of life of these two social groups across all the 21 districts in Haryana. Level of quality of life of these two segments of population has been assessed in order to help the policy makers to identify the districts and intervention areas where they need to focus to improve upon the quality of life.

Methodology

The paper analyses data made available by the recent 2011 Census of India. Information in respect of house regarding its nature (e.g. material of which it is built) is by individual census houses. On the other hand, information in respect of amenities and assets is by individual households. It may be noted that availability rather than ownership is what matters in relation to an asset. For example, a household may not be owning a car but is having it by virtue of its head being a high status government official. It was recorded as an asset of the household.

Constrained by the nature of data made available by the 2011 Census of India, the quality of life for scheduled castes and non-scheduled castes refers to three sets of indicators: (i) economic wellbeing, (ii) status of women, and (iii)

degree of modernization. These were termed as components of quality of life. The total number of indicators comes out as eleven. Economic wellbeing was discerned through the indicators of: (a) percentage of *pucca* houses, and (b) percentage of households with at least one of the specified assets. Status of women was inferred from the indicators of: (a) percentage of households having a kitchen facility, (b) percentage of households having bathroom facility, (c) percentage of households having flush latrine, and (d) percentage of households using LPG as cooking fuel. Degree of modernization was assessed through: (a) percentage of households availing of bank services, (b) percentage of households having computer with internet facility, (c) percentage of households having car/jeep/van, (d) percentage of households having mobile, and (e) percentage of households having television. Summation of scores on these three components yielded the composite picture on quality of life.

To ensure authenticity of the results emerging from the analysis a sophisticated technique was used for the purpose. As a first step, the base data for non-scheduled castes and scheduled castes on each of the 11 indicators for all the districts of Haryana was organized in the form of a master table. The figure for each district on a given indicator separately for non-SCs and SCs was divided by their respective state averages. This standardization transformed the base data into Z scores in each case. Using the score thus obtained a correlation matrix separately for non-SCs and SCs was generated. To determine the relative weight of an indicator separately for non-SCs and SCs its correlation coefficients with all indicators were summed up. For providing common base for meaningful comparisons between non-SCs and SCs weight for total population (including non-SCs and SCs) was calculated for each of the indicators. Same weight was applied for non-SCs and SCs on each of the indicators. Higher the figure resulting from the summation in respect of an indicator heavier was its weight. Further, the Z score of any district on various indicators was multiplied by their respective weight. The results were worked out for all the 11 indicators separately for non-SCs and SCs each district. Results thus obtained were added for the indicators falling under each component, viz., economic wellbeing, status of women and modernization level separately for non-SCs and SCs. In each case summation for indicators comprising a component was divided by the number of indicators. This was meant to ensure that no component gets overdue importance in constructing the overall picture simply because a larger number of indicators have been adopted in its case. Finally, such average score of each component was summed up for every district separately for non-SCs and SCs. This yielded a quantitative measure of their quality of life in each district.

Economic well-being

(a) *PUCCA* HOUSE

Housing is one of the basic requirements of human well-being. It provides significant economic security and dignity in society. The most conspicuous indicator of economic development is the high percentage of *pucca* houses as it fulfills the requirements of shelter as well as other facilities in the micro-environment of housing such as type of dwelling unit, drinking water, sanitation, hygiene which form vital components of overall quality of life of population.

In the present study, the houses recorded as having concrete or brick roofs were considered as *pucca*. The state average stands at 47 per cent; 35 per cent among scheduled castes and 51 per cent among non-scheduled castes. The corresponding figures at all-India level were 36, 30 and 37 per cent respectively. *Pucca* houses among the non-scheduled caste households were 1.4 times higher than the scheduled caste in Haryana and 1.2 times at all-India level. Thus, both the social groups were better placed in Haryana than their counterparts at all-India level.

The differentials between these two segments of population at district level in the state

are quite wide. The highest figure among scheduled caste households at 61 per cent is for Panchkula district and the lowest at 14 per cent for Palawal district. The corresponding figures for non-SC households stand at 84 per cent in Panchkula district and 15 per cent in Mewat district. Panchkula-Yamunanagar-Ambala belt of districts has been noted for high scores of 52 to 84 per cent while Mahendragarh-Rewari-Palwal-Mewat belt of districts in southern Haryana has a low score of less than 20 per cent.

The scheduled castes lagged behind their counterparts on the count of *pucca* house in all districts except in Mewat district where they were marginally ahead of non-scheduled castes by 0.6 per cent points. In Faridabad, Gurgaon and Rohtak districts the non-scheduled castes were ahead of scheduled castes by about 25 per cent points. This difference was less than 10 per cent points in Bhiwani and Jhajjar districts in central Haryana and Rewari, Mahendragarh and Palwal districts in southern Haryana. The figure for scheduled caste households by *pucca* houses in Mewat district stands at 15.5 per cent and for non-scheduled castes at 14.9 per cent. This was primarily due to the fact that Muslims constitute a higher proportion of population in Mewat district and seem to be even more backward than the scheduled castes.

(b) AT LEAST ONE OF THE ASSETS

Assets owned by any household reflect its economic dynamism. In the present paper families with at least one of the assets from radio / transistor, television, computer / laptop, landline telephone / mobile, bicycle, scooter / motorcycle / moped and car / jeep / van were analyzed. In Haryana 91 per cent of the total households, 83 per cent among scheduled castes and 93 per cent among non-scheduled castes had at least one of these assets available with them. The corresponding all-India level figures of 82, 77 and 83 are much lower than the respective state averages. However, the gap between the non-SCs and SCs by 10 per cent points in Haryana was wider than the all-India average of six per cent points. This was indicative of the fact that SC households in Haryana lagged much behind their counterparts at all-India level on the count of possession of at least one asset as mentioned above.

The highest figure for scheduled caste households at about 91 per cent is noted in the case of Ambala and Yamunanagar districts and the lowest of 74 per cent in Mewat and Mahendragarh districts in southern Haryana. As regards the non-SC households having at least one asset Ambala, Faridabad, Kurukshetra and Panchkula districts are noted for high scores of more than 96 per cent while Mewat has a low score of less than 80 per cent. In 18 of the 21 districts in the state more than 90 per cent of non-scheduled caste households had at least one asset available with them whereas in case of scheduled caste households the number of such districts was only two.

Scheduled castes lagged behind their counterparts in all districts in the state as regards possession of at least one asset. In Mahendragarh district, the non-scheduled castes were ahead of scheduled castes by about 15 per cent points while this difference was about two per cent points in Yamunanagar district. It is important to mention here that in Yamunanagar district more than 90 per cent of SC and non-SC households had at least one asset available with them while in Mahendragarh district 74 per cent of the SCs and 89 per cent of the non-SCs falls in this category leading to a wide gap between these two social groups.

Panchkula district, located in the neighbourhood of the state capital, Chandigarh, occupied the top position on ranking of wellbeing among both segments of population in Haryana closely followed by Yamunanagar and Sirsa districts (Table 1). Districts of Ambala, Kurukshetra and Panipat located along side of the GT Road are placed in the upper middle range. Mewat district finds a place at the bottom closely accompanied by the Palwal and Mahendragarh on the count of economic wellbeing among both segments of the population. The southern districts

Table - 1: Haryana: Ranking of Districts by Composite Index* on Economic Wellbeing of non-Scheduled Caste and Scheduled Caste Households

Name of District	non-Scheduled Caste (non-SC)	Scheduled Caste (SC)	Difference (non-SC minus SC)
Faridabad	1.89	1.3	0.56
Rohtak	1.76	1.2	0.56
Gurgaon	2.01	1.5	0.53
Sirsa	2.27	1.8	0.51
Kaithal	1.65	1.2	0.5
Jind	1.65	1.2	0.5
Panchkula	2.44	2.0	0.49
Hisar	1.87	1.4	0.48
Karnal	2.04	1.6	0.47
Kurukshetra	2.07	1.6	0.47
Sonipat	1.75	1.3	0.47
Fatehabad	2.11	1.7	0.45
Ambala	2.23	1.8	0.41
Yamunanagar	2.32	1.9	0.41
Panipat	1.91	1.5	0.38
Bhiwani	1.43	1.1	0.3
Mahendragarh	1.32	1.1	0.26
Jhajjar	1.44	1.2	0.25
Rewari	1.37	1.1	0.24
Palwal	1.17	1	0.17
Mewat	1.03	1	0.04

Source: Computed from data made available in different volumes of Tables on Houses, Household Amenities and Assets and Tables on Houses, Household Amenities and Assets for Scheduled Castes, India and Haryana, Registrar General & Census Commissioner, India.
** Districts are ranked according to difference in Composite Index.*

in the state are noted for relatively lower level of economic wellbeing. The difference between the non-scheduled caste and scheduled caste as regards the economic wellbeing was wide in Faridabad and Rohtak districts closely followed by Gurgaon district and quite narrow in Mewat, Palwal, Rewari and Mahendragarh districts (Table 1). In fact, both the social groups in these districts were ranked quite low on the indicators of economic wellbeing. Districts having higher economic wellbeing levels among non-scheduled castes households were also marked with relatively higher level of economic wellbeing among scheduled caste households and *vice versa*. This is substantiated by correlation value of 0.952 between the non-scheduled caste and scheduled caste households on economic wellbeing which reflects a strong association in this regard.

Among the different indicators of economic wellbeing, the districtwise disparity in the proportion of *pucca* house is of higher order among both social groups. The disparity among the non-SC hosuholds was of higher order than among

the scheduled caste households. The degree of difference in the proportion of households having at least one asset comes next on reckoning. Districtwise difference in proportion of non-SC and SC households was minimal but in favour of scheduled caste households.

Status of Women

(a) KITCHEN

Two in every three households in Haryana have a separate kitchen facility. The state average of 66 per cent is higher than the all-India figure of 61 per cent. About 45 per cent of SC households and 72 per cent among the non-SC households in the state have a separate kitchen facility. The corresponding figures at all-India level are 49 and 64 per cent. The scheduled castes in Haryana lagged behind their counterparts at all-India level by three per cent points while non-scheduled castes were ahead by nine per cent points.

Ambala district at 69 per cent had the highest proportion of households having kitchen facility among SCs closely followed by Yamunanagar and Panchkula districts. Mewat and Palwal districts were at the bottom on this indicator at about 28 per cent. As regards the non-SC households having separate kitchen facility Ambala, Panchkula, Yamunanagar, Kurukshetra districts with a figure of more than 80 per cent were placed at a higher level while Mewat with 31 per cent of such households was at the bottom.

Scheduled castes lagged behind their counterparts in all districts in the state with varying degrees as regards having a kitchen facility. In Sirsa and Fatehabad districts in western Haryana, the non-scheduled castes were ahead of scheduled castes by about 40 per cent points while this difference was about three per cent points in Mewat district. Both the segments of population in Mewat district were placed quite low in terms of having separate kitchen facility; the figure among scheduled caste households was 28 per cent and among non-scheduled caste households 31 per cent. In all, non-SCs were ahead of SC households by more than 30 per cent points in seven districts of the state. This difference was less than 20 per cent points in another five districts. Border and peripheral districts in western Haryana had higher differentials among the non-SC and SCs.

(b) BATHROOM

The state average of the households having a bathroom facility within the house stands at 68 per cent which is much higher than the all-India average of 42 per cent. Both the non-scheduled caste and scheduled caste households in Haryana are better placed than their counterparts at all-India level. One in every two scheduled caste households had a bathroom facility in Haryana as compared to one in every five at all-India level. As regards the non-scheduled castes households three in every four in Haryana and one in every two at all-India level had the facility of bathroom. Both the social groups in the state are way ahead of their counterparts at all-India level. Despite the fact that both the segments of population had higher proportion of bathroom facility as compared to their counterparts in Haryana, the gap between these two groups by 25 per cent points was wider in Haryana as compared to all-India level of 17 per cent points. The proportion of scheduled caste households in Haryana with bathroom facility was 1.7 times to that of all-India average while among the non-scheduled cast households this proportion was higher by 1.6 times.

Gurgaon with 68 per cent of the SC households having a bathroom within the house, emerged on the top while Mahendragarh, with 31 per cent is at the bottom. In case of non-scheduled caste households, Gurgaon with 86 per cent was placed at the top while Mewat with 26 per cent at the bottom. In 19 out of the total of 21 districts more than 50 per cent of the non-scheduled caste households had bathrooms within the house. The figure was 11 districts in case of scheduled caste households.

The scheduled caste households again lagged behind their counterparts in all districts in

the state with varying degrees on the count of having bathroom facility within the house. Non-scheduled caste households in Sirsa district were ahead of scheduled castes by about 37 per cent points while this difference was about less than two per cent points in Mewat district. In Mewat district both the segments of population were placed quite low on this indicator, 24 per cent among scheduled castes and 26 per cent among non-scheduled castes. Border and peripheral districts including Sirsa, Fatehabad, Yamunanagar, Kaithal, Bhiwani and Hisar in the state are noted for higher differentials among the non-SC and SCs as regards having bathroom facility within the house.

(c) FLUSH LATRINE

About 22 per cent of the total households in the state enjoy this facility. This proportion in the state is twice higher than the all-India average of 11 per cent. Scheduled caste as well as non-scheduled caste households were better placed in Haryana than they were at all-India level. In Haryana 13 per cent of the SC households had the facility of flush latrine as compared to eight per cent at all-India level. The corresponding figures for non-scheduled caste households were 24 and 13 per cent respectively. The scheduled caste households lagged behind non-scheduled castes in Haryana by 11 per cent points and by five per cent points at all-India level. Notably, both the segments of population at all-India level were placed on lower side as compared to Haryana.

The highest figure for scheduled caste households having flush latrine at 36 per cent is for Gurgaon district followed by Faridabad (24 per cent), Rohtak (22 per cent) and Panchkula (20 per cent) districts while this score is barely one per cent in Mewat and four per cent in Palwal and Mahendragarh districts in southern Haryana. About half of the districts in the state had less than ten per cent of the SC households with flush latrine facility. Evidently there is no district which can claim a majority of scheduled castes households benefitting from this facility. As regards the non-scheduled castes, Gurgaon with 56 per cent of households could claim to be the only district where majority of them enjoyed this facility. It was closely followed by Panchkula (49 per cent) and Faridabad (45 per cent) districts. Only five districts had figures higher than the state average of 24 per cent among non-scheduled caste households.

Scheduled caste households lagged behind their counterparts in all districts in the state with varying degrees on this indicator with the exception of Mewat district where they were marginally ahead. Here 1.32 per cent of the SC households had this facility as compared to 1.11 per cent among non-scheduled caste households. However, the non-scheduled caste households were ahead of SC households by more than 20 per cent points in Panchkula and Faridabad districts. In 11 of the total of 21 districts the difference in favour of non-scheduled caste households was less than 10 per cent points. Non-scheduled caste households in the districts with large urban centres including Panchkula, Faridabad and Gurgaon were way ahead of their counterparts while this difference between the two segments of population was slender in Mewat, Mahendragarh, Palwal and Rewari districts in southern Haryana and Jhajjar and Bhiwani districts in central Haryana.

(d) LPG

Less than half of the total households in Haryana use LPG as the fuel for cooking, the state average being 44 per cent is higher than the all-India average of 28 per cent. One-fourth of the scheduled caste households in Haryana use LPG as the fuel for cooking as compared to 17 per cent at all-India level. The corresponding figures for non-scheduled caste households were 49 and 31 per cent. The difference of 24 per cent points between these two segments of population in favour of non-scheduled caste households was wider in Haryana as compared to 14 per cent at the all-India level. Thus, SCs in Haryana lagged behind their counterparts by a wider margin as compared to all-India level.

In Faridabad and Gurgaon districts over

Table - 2: Haryana: Ranking of Districts by Composite Index* on Status of Women of non-Scheduled Caste and Scheduled Caste Households

Name of District	non-Scheduled Caste (non-SC)	Scheduled Caste (SC)	Difference (non-SC minus SC)
Panchkula	5.22	3.06	2.16
Sirsa	3.48	1.59	1.89
Faridabad	5.16	3.31	1.85
Yamunanagar	4.00	2.17	1.83
Rohtak	4.36	2.58	1.78
Kurukshetra	3.96	2.25	1.71
Gurgaon	5.6	3.91	1.69
Fatehabad	3.18	1.49	1.69
Karnal	3.91	2.29	1.62
Hisar	3.59	1.99	1.6
Kaithal	2.97	1.44	1.53
Jind	2.96	1.48	1.48
Ambala	4.01	2.57	1.44
Sonipat	3.6	2.3	1.3
Bhiwani	2.97	1.71	1.26
Panipat	3.86	2.7	1.16
Rewari	3.04	1.99	1.05
Mahendragarh	2.3	1.27	1.03
Jhajjar	3.28	2.34	0.94
Palwal	2.09	1.25	0.84
Mewat	0.94	0.97	-0.03

Source: Computed from data made available in different volumes of Tables on Houses, Household Amenities and Assets and Tables on Houses, Household Amenities and Assets for Scheduled Castes, India and Haryana, Registrar General & Census Commissioner, India.

** Districts are ranked according to difference in Composite Index.*

half of the scheduled caste households (53 per cent) are beneficiary of this facility while in Kaithal and Sirsa about one-tenth (11 per cent) of the households use this fuel for cooking. Gurgaon and Faridabad districts with more than 75 per cent of non-scheduled caste households using LPG for cooking are at the top while Mewat with less than 10 per cent is at the bottom. The number of districts with more than half of the households using LPG was two in case of scheduled caste households and 10 in case of non-scheduled caste households.

The scheduled caste households lagged behind their counterparts in all districts in the state as regards use of LPG fuel for cooking with the exception of Mewat district where they were ahead, i.e. 14.32 per cent of the SC households had this facility as compared to 9.51 per cent among non-scheduled caste households. However, the non-scheduled caste households were ahead of SC households as regards the use of LPG by more than 30 per cent points in Kurukshetra, Yamunanagar, Ambala and Karnala districts. The difference

between the two segments of population in favour of non-scheduled caste households by 13 per cent points was least in Palwal district. Jhajjar, Rewari, Mahendragarh and Bhiwani were the other districts where the gap between SC and Non-SC households was less than 20 per cent points.

The presence of a separate kitchen, bathroom and latrine in house and use of LPG as the fuel for cooking were deemed as most sensitive indicators of the status of women. In this respect, Gurgaon district was assessed on the top for both the social groups closely followed by Panchkula and Faridabad districts while Mewat, Palwal and Mahendragarh districts in southern Haryana are placed at the bottom (Table 2). Districts with higher status of women among the non-scheduled castes households are marked with relatively higher status of women among scheduled caste households and *vice versa*. The correlation value of 0.952 between the non-scheduled caste and scheduled caste households on status of women reflects a strong link in this regard.

Gurgaon district whic ranked at the top on the count of status of women had the highest index value for the non-scheduled caste households as well as for scheduled caste households (Table 2). Also Mewat which was ranked at bottom had the lowest index value for both non-scheduled caste and scheduled caste households. The difference in the index value of status of women between the two social groups was highest in Panchkula and lowest in Mewat, Palwal and Mahendragarh districts. Both the social groups in these districts were ranked quite low on the indicators for status of women.

Among the different indicators of status of women, the presence of flush latrine displayed the highest degree of differentiation among both segments of population across different districts. It is followed by the indicator of the use of LPG as the fuel for cooking. Differentiation on the presence of bathroom and kitchen are of a low order. The chronological sequencing of all the indicators of status of women was in the same order in both the segments of population even though these differed on its index values. The differences in the index values of these two social groups revealed that it was highest in flush latrine followed by LPG, bathroom and kitchen.

Modernization Level

(a) BANKING SERVICES

About 68 per cent of the total households in Haryana had availed of banking services which was higher than the all-India average of 59 per cent. Caste-wise differentials reveal that scheduled castes in Haryana as well as all-India level lagged behind their counterparts though with varying degrees. Both the scheduled caste and the non-scheduled caste households in Haryana were better placed than their counterparts at all-India level. The figure of 54 per cent scheduled caste households in Haryana having banking services was higher than all-India figure of 51 per cent. The corresponding figures for non-SC households were 71 and 60 per cent. The difference between these two segments of population in Haryana was of 14 per cent points in favour of non-scheduled caste households as compared to 10 per cent points at all-India level.

The percentage of households availing banking services among scheduled castes was the highest in Rewari and Gurgaon districts at 68 per cent and the lowest for Sirsa and Mewat districts at 48 per cent. Except for these two districts majority of SC households in every district of the state had availed of banking services. As regards the non-SC households, the percentage was the highest in Panchkula and Rewari districts at 83 per cent and the lowest in Mewat district at 40 per cent. The number of districts with more than two-thirds of the households availing banking services was two in case of scheduled caste households and 19 in case of non-scheduled caste households.

Mewat was the only district where scheduled caste households were ahead of non-scheduled caste households by seven per cent points on the count of availing banking services. In all other 20 districts, the SC households lagged

behind their counterparts with varying degrees. The difference between these two segments of population in favour of non-SC households by 21 per cent points was highest in Faridabad district closely followed by Sirsa while this gap was minimal in Yamunanagar district by eight per cent points.

(b) COMPUTER / LAPTOP WITH INTERNET FACILITY

If Haryana is lackluster on any modernization indicator, it happens to be the use of computer/laptop with internet facility. Only 5.3 per cent of the total households in the state were users of this facility. The state can take claim that it is higher than the all-India average of three per cent. The use of this facility among SC households in the state was further disheartening. Less than two per cent (1.7 per cent) of the households among SCs use computer/laptop with internet facility. This figure ranged from the highest of 5 per cent in Gurgaon to the lowest of 0.6 per cent in Mewat and Fatehabad. In six districts, the proportion of households among SCs with use of computer/laptop with internet facility was less than one per cent. As regards use of this facility among non-SC households is concerned, the figure ranged from the highest of 24 per cent in Gurgaon and 20 per cent in Panchkula to 0.6 in Mewat, 1.6 per cent in Mahendragarh and 1.9 per cent in Bhiwani districts. Both the segments of population in the state had higher access to this facility as compared to their counterparts at all-India level.

The differentials between the two segments of population at the districts level reveal that Mewat was the only district where scheduled caste households were marginally ahead of non-scheduled caste households as regards computer/laptop with internet facility. In all other 20 districts, the scheduled caste households lagged behind their counterparts with varying degrees. The non-scheduled cast households have outnumbered their counterparts as regards use of computer/laptop with internet facility by 19 per cent points in Gurgaon district, by 17 per cent points in Panchkula and by 10 per cent points in Faridabad district. In Jind and Mahendragarh districts the non-scheduled caste households were marginally ahead of scheduled caste households. In 16 of the total of 21 districts the non-scheduled caste households were ahead by SC households by less than five per cent points, thereby indicating an overall less usage on computers/laptop with internet facility.

(c) CAR/JEEP/VAN

The relative prosperity of Haryana is reflected by the fact that one in every ten households enjoys the facility of car/jeep/van which was 2.3 times higher than the all-India average of 4.6 per cent. The proportion of households with car/jeep/van among non-scheduled caste households in the state (12.5 per cent) was 3.4 times higher than among the scheduled castes (3.7 per cent). At all-India level this proportion was higher by 2.9 times. Both the segments of population in Haryana enjoy better facility on the count of car/jeep/van than their counterparts at all-India level. In Haryana 3.7 per cent of the households among scheduled castes enjoyed facility of car/jeep/van as compared to 1.8 per cent at all-India level. There were district level variations in this regard. The figure ranged from the highest of 9.5 per cent in Gurgaon to lowest of 1.7 per cent in Palwal district. Among non-scheduled caste households, the figure ranged from the highest of 32 per cent in Gurgaon and Panchkula to the lowest of four per cent in Mewat and five per cent in Mahendragarh districts. The number of districts with five percent of households enjoying the facility of car/jeep/van was five in case of scheduled caste households and 20 in case of non-scheduled caste households.

As regards the car/jeep/van facility, the non-scheduled caste households in the state were ahead of schedule caste households by nine per cent points which was 2.5 times higher than the all-India figure. Further, the non-scheduled castes have outnumbered their counterparts in all districts in the state with varying degrees. It ranged from 26

per cent points in Panchkula, 24 per cent points in Gurgaon and 15 per cent points in Faridabad to 0.6 per cent points in Jind, 1.5 per cent points in Mahendragarh to 1.7 per cent points in Mewat.

(d) MOBILE

Two in every three households (67 per cent) in Haryana enjoyed the facility of mobile as compared to one in every two at all-India level (53 per cent). Both the scheduled caste and non-scheduled caste households had a higher proportion of mobiles in Haryana than their counterparts at all-India Level. About 60 per cent of the scheduled caste households had the facility of mobile in the state as compared to 47 per cent at all-India level. The corresponding figures for non-scheduled caste households were 70 and 54 per cent respectively.

The range of values on this item among the scheduled caste households in different districts varied from 63 per cent in Faridabad and Gurgaon districts to 49 per cent in Palwal and 54 per cent in Sonipat district. Among the non-scheduled caste households the percentage ranged from 75 in Hisar and Bhiwani district to 55 in Panchkula and 61 in Ambala districts. Majority of the households in all districts except in Palwal district had mobiles irrespective of the caste factor.

Interestingly a higher proportion of scheduled caste households in Panchkula and Gurgaon districts had facility of mobile as compared to non-scheduled castes in both districts, even though the margin was slender. In rest of 19 districts the non-scheduled caste households outnumbered their counterparts on the count of facility of mobile. The difference between the two segments of population in favour of non-scheduled castes ranged from 19 per cent points in Kaithal, 17 per cent points in Fatehabad, 4 per cent in Ambala and 5.6 per cent in Faridabad district.

(e) TELEVISION

The presence of a television is the most pervasive feature of Haryana houses next only to banking services among indicators of modernization level. About 68 per cent of the households in the state have television as compared to 47 per cent at the all-India level. Fifty-five per cent of the households among the scheduled castes in Haryana had television as compared to 39 per cent at all-India level. Both the non-scheduled castes and scheduled caste households in Haryana were ahead of their counterparts at all-India level as regards possession of a television set. The proportion of scheduled caste households having television in Haryana was 1.4 times higher than the all-India average while among the non-scheduled caste households this figure was 1.5 times higher in Haryana than the all-India average.

The percentage of households among the scheduled castes having a television set ranged from 72 per cent in Ambala, 68 per cent in Panchkula and Yamunanagar to 32 per cent in Mewat and 34 per cent in Sonipat. In 13 districts more than half of the households among SCs had television. As regards the non-scheduled caste, the proportion of households with television ranged from 87 per cent in Ambala district, 84 per cent in Kurukshetra and Panchkula districts to 16 per cent in Mewat district. Majority of the households among non-scheduled castes in all districts except Mewat had the facility of a television. In Ambala, Kurukshetra, Panchkula, Faridabad and Karnal districts more than 80 per cent of the non-scheduled caste households had a television set.

The composite index on modernization level component had placed Gurgaon district at the top among both the social groups (Table 3). Panchkula, Faridabad and Ambala districts, each with a major city, follow next in line. Karnal, Rohtak and Yamunanagar also belong to the middle range in this context for both the social groups. Mewat district has the distinction of being at the bottom among the households belonging to both the social groups. Mahendragarh, Bhiwani and Palwal districts are its close associates. In fact most of the districts in southern most Haryana fall

Table - 3: Haryana: Ranking of Districts by Composite Index* of Modernization Level of non-Scheduled Caste and Scheduled Caste Households

Name of District	non-Scheduled Caste (non-SC)	Scheduled Caste (SC)	Difference (non-SC minus SC)
Gurgaon	4.7	1.64	3.06
Panchkula	4.44	1.43	3.01
Faridabad	3.22	1.31	1.91
Ambala	2.49	1.23	1.26
Sirsa	1.77	0.71	1.06
Karnal	1.88	0.87	1.01
Kurukshetra	2.04	1.14	0.9
Rohtak	1.85	0.97	0.88
Fatehabad	1.52	0.69	0.83
Hisar	1.59	0.8	0.79
Yamunanagar	1.84	1.06	0.78
Sonipat	1.69	0.99	0.7
Panipat	1.74	1.04	0.7
Rewari	1.6	1.04	0.56
Kaithal	1.37	0.82	0.55
Jhajjar	1.59	1.05	0.54
Bhiwani	1.21	0.72	0.49
Palwal	1.29	0.82	0.47
Mahendragarh	1.13	0.81	0.32
Jind	1.32	1.01	0.31
Mewat	0.47	0.59	-0.12

Source: Computed from data made available in different volumes of Tables on Houses, Household Amenities and Assets and Tables on Houses, Household Amenities and Assets for Scheduled Castes, India and Haryana, Registrar General & Census Commissioner, India.
** Districts are ranked according to difference in Composite Index.*

in the same category. Districts with higher level of modernization level among non-scheduled castes households were marked with relatively higher level of modernization level among the scheduled caste households and *vice versa*. The correlation value of 0.895 between the scheduled caste and non-scheduled caste households on indicators of modernization further endorse this situation.

Among the various indicators of modernization level, internet emerged as the strongest differentiating factor for the districts of Haryana among both the segments of population. This is followed by the indicator of car/jeep/van. The facility of television, use of banking and mobile was of lowest order among households belonging to both the social groups. The difference in the index value of these social groups revealed that it was highest in computer/laptop with internet facility followed by car/jeep/van, television, banking and mobiles.

Table 4 portrays the state average of all the indicators for non-scheduled caste and scheduled

Table - 4: Distribution of Districts with Highest and Lowest Percentage Values of Different Kinds of Assets and Amenities among non-Scheduled & Scheduled Castes

Assets and amenities	State average (in percentage)		Districts with highest percentage		Districts with lowest percentage	
	non-SC	SC	non-SC	SC	non-SC	SC
Economic wellbeing						
Pucca house	50.6	35.0	Panchkula (84.0)	Panchkula (60.9)	Mewat (14.9)	Palwal (13.7)
With at least one asset	92.8	83.2	Ambala (97.0)	Ambala (91.9)	Mewat (79.8)	Mahendragarh (73.9)
Status of women						
Kitchen facility	72.3	46.1	Ambala (87.4)	Ambala (69.2)	Mewat (31.4)	Mewat (27.9)
Bathroom facility	73.6	48.9	Gurgaon (86.2)	Gurgaon (67.7)	Mewat (26.1)	Mewat (24.1)
Flush latrine	24.4	13.2	Gurgaon (56.4)	Gurgaon (36.5)	Mewat (1.1)	Mewat (1.3)
LPG	49.4	24.9	Gurgaon (78.0)	Faridabad (53.8)	Mewat (9.5)	Kaithal (11.5)
Modernization level						
Banking services	71.3	57.1	Panchkula (83.5)	Rewari (69.2)	Mewat (40.2)	Mewat 47.7)
Computer with internet facility	6.3	1.2	Gurgaon (23.6)	Gurgaon (5.0)	Mewat (0.6)	Fatehabad (0.6)
Car/jeep/van	12.5	3.7	Gurgaon (32.4)	Gurgaon (8.5)	Mewat (4.1)	Fatehabad (1.7)
Mobile	69.7	57.4	Hisar (75.3)	Faridabad (63.5)	Panchkula (55.0)	Palwal (48.7)
Television	71.6	54.8	Ambala (86.8)	Ambala (72.5)	Mewat (16.0)	Mewat (32.0)

Source: Computed from data made available in different volumes of Tables on Houses, Household Amenities and Assets and Tables on Houses, Household Amenities and Assets for Scheduled Castes, India and Haryana, Registrar General & Census Commissioner, India

caste households and the districts with highest and lowest values on different indicators separately for non-scheduled castes and scheduled castes. It shows that the difference between non-scheduled and scheduled castes at the state level was highest on the indicator of kitchen facility at 26 per cent points followed by bathroom at 25 per cent points while the difference between these two segments of population was least on the count of computer with internet facility at five per cent points.

Gurgaon district emerged on top on five out of the total of 11 indicators among the non-scheduled castes and on four indicators among scheduled castes. While reoccurrence of Mewat district was most frequent (9 times) in the districts with least values among non-scheduled castes as well as among scheduled castes (5 times). Thus, the non-scheduled castes and scheduled castes in Gurgaon had relatively higher access to amenities as compared to other districts while both the segments of population in Mewat district lagged behind their counterparts in other districts.

Table – 5: Haryana: Ranking of Districts by Composite Index* of Quality of Life of non-Scheduled Caste and Scheduled Caste Households

Name of District	non-Scheduled Caste (non-SC)	Scheduled Caste (SC)	Difference (non-SC minus SC)
Panchkula	12.10	6.44	5.66
Gurgaon	12.30	7.03	5.27
Faridabad	10.27	5.95	4.32
Sirsa	7.52	4.06	3.46
Rohtak	7.98	4.75	3.23
Ambala	8.73	5.62	3.11
Karnal	7.82	4.73	3.09
Kurukshetra	8.06	4.99	3.07
Yamunanagar	8.16	5.14	3.02
Fatehabad	6.81	3.84	2.97
Hisar	7.05	4.18	2.87
Kaithal	5.99	3.41	2.58
Sonipat	7.04	4.58	2.46
Jind	5.93	3.65	2.28
Panipat	7.51	5.27	2.24
Bhiwani	5.61	3.56	2.05
Rewari	6.00	4.16	1.84
Jhajjar	6.31	4.59	1.72
Mahendragarh	4.75	3.14	1.61
Palwal	4.55	3.07	1.48
Mewat	2.43	2.55	(-)0.12

Source: Computed from data made available in different volumes of Tables on Houses, Household Amenities and Assets and Tables on Houses, Household Amenities and Assets for Scheduled Castes, India and Haryana, Registrar General & Census Commissioner, India.
** Districts are ranked according to difference in Composite Index.*

An additional exercise in correlates of the quality of life of non-scheduled castes and scheduled castes revealed the pre-eminence of the factor of urbanization followed by per capita income and percentage of non-agricultural workers in rural areas. Also, in areas of their heavy concentration, the scheduled caste population shared a lower degree of quality of life.

Quality of Life

Gurgaon district is the top ranking in Haryana on the composite index of quality of life of both the non-scheduled caste as well as scheduled caste households (Table 5). It is closely followed by Panchkula and Faridabad districts by both groups of population on this count. Both Gurgaon and Faridabad districts are located in the neighborhood of New Delhi, the capital of India and Panchkula is located in the neighbourhood of the state capital of Haryana, Chandigarh.

On the other extreme, Mewat district lies at the bottom in respect of overall quality of life of both the segments of population. Mewat is closely

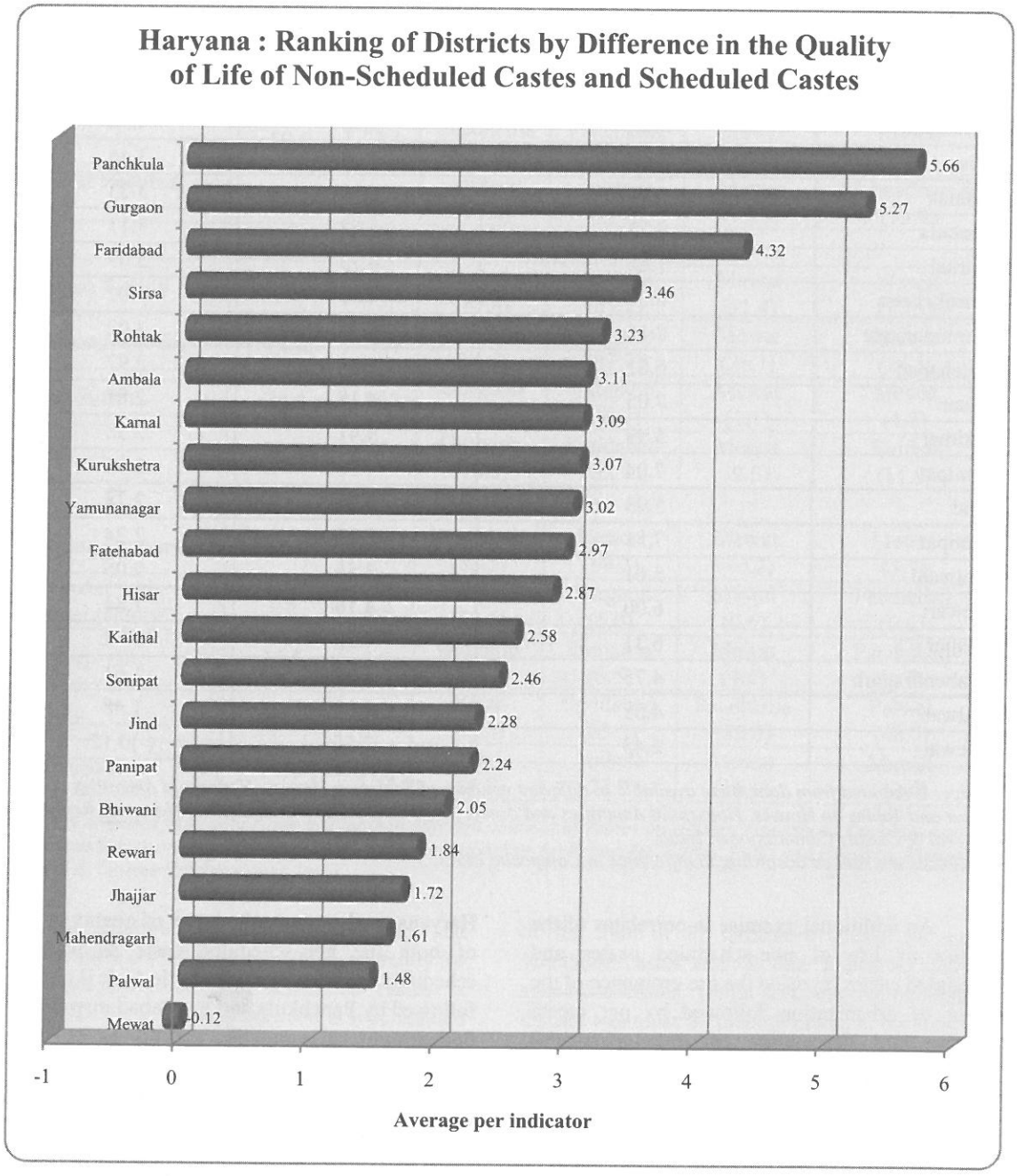
Haryana : Ranking of Districts by Difference in the Quality of Life of Non-Scheduled Castes and Scheduled Castes
Panchkula
Gurgaon
Faridabad
Sirsa
Rohtak
Ambala
Karnal
Kurukshetra
Yamunanagar
Fatehabad
Hisar
Kaithal
Sonipat
Jind
Panipat
Bhiwani
Rewari
Jhajjar
Mahendragarh
Palwal
Mewat
5.66
5.27
4.32
3.46
3.23
3.11
3.09
3.07
3.02
2.97
2.87
2.58
2.46
2.28
2.24
2.05
1.84
1.72
1.61
1.48
-0.12
-1
0
1
2
3
4
5
6
Average per indicator

Fig. 1

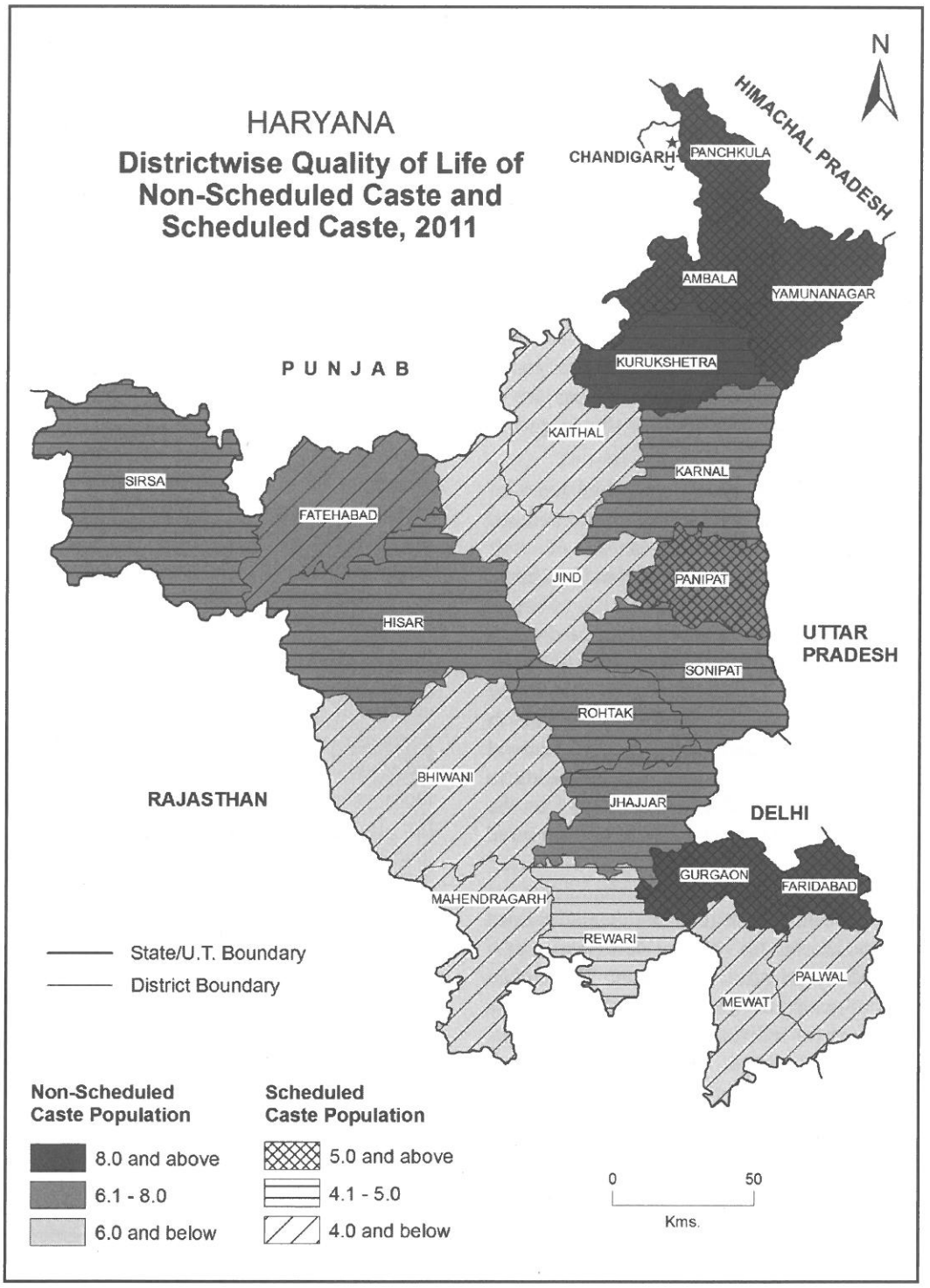
HARYANA
Districtwise Quality of Life of Non-Scheduled Caste and Scheduled Caste, 2011
N
HIMACHAL PRADESH
CHANDIGARH
PANCHKULA
AMBALA
YAMUNANAGAR
KURUKSHETRA
PUNJAB
KAITHAL
KARNAL
SIRSA
FATEHABAD
JIND
PANIPAT
HISAR
UTTAR PRADESH
SONIPAT
ROHTAK
BHIWANI
RAJASTHAN
JHAJJAR
DELHI
GURGAON
FARIDABAD
MAHENDRAGARH
REWARI
PALWAL
MEWAT
State/U.T. Boundary
District Boundary
Non-Scheduled Caste Population
8.0 and above
6.1 - 8.0
6.0 and below
Scheduled Caste Population
5.0 and above
4.1 - 5.0
4.0 and below
0
50
Kms.

Fig. 2

Table - 6: Haryana: Quality of Life by Components

Component	non-Scheduled Castes (non-SC)	Scheduled Castes (SC)	Difference (non-SC minus SC
Modernization level	52.79	26.35	26.44
Economic wellbeing	21.92	21.79	0.13
Status of women	30.27	34.77	-4.5
Quality of life	**31.96**	**27.6**	**4.36**

Source: Computed from data made available in different volumes of Tables on Houses, Household Amenities and Assets and Tables on Houses, Household Amenities and Assets for Scheduled Castes, India and Haryana, Registrar General & Census Commissioner, India.

followed by Palwal and Mahendragarh districts. In fact most of the districts in southern most part of the state are marked with relatively lower quality of life.

The difference in the composite index of these social groups reveals that non-scheduled caste households were way ahead of their counterparts in Panchkula, Gurgaon and Faridabad districts, thereby indicating that quality of life of non-scheduled caste households in these districts was far better than among the scheduled caste households (Fig. 1). On the other hand, the difference in the quality of life was minimal in Rewari, Jhajjar, Mahendragarh and Palwal districts (Fig. 1). Here households belonging to both segments of population were placed on the lower side as regards quality of life captured through access to different kinds of amenities. However, quality of life among scheduled caste households was better than the non-scheduled caste households in Mewat district largely dominated by Muslim population. The spatial patterns of quality of life, based on the composite index values for individual districts, for both the non-scheduled caste and scheduled caste households as depicted in Fig. 2 reveal that (i) high level of quality of life exists among both the segments of population in five districts *viz.*, Panchkula, Ambala and Yamunanagar which form one contiguous patch in the north of the state and Gurgaon and Faridabad districts located adjacent to the national capital, New Delhi; (ii) a moderate level of quality of life among both the segments of population can be identified in six districts out of which five i.e., Sonipat, Jhajjar, Rohtak, Hisar and Sirsa, extending from east to west in central part of Haryana, form a contiguous area; (iii) a low level of quality of life among both the segments of population has been identified in six districts which occur as three contiguous patches in different parts of the state with two districts each *viz.*, Kaithal and Jind, Bhiwani and Mahendragarh, and Palwal and Mewat (Fig.2). Thus in seventeen out of twenty one districts in the state there is a broad correspondence in the relative level of quality of life among both the segments of population although there is a wide disparity in the index value e.g., for Gurgaon district, having high index values for both the segments of population the index value for non-scheduled caste households is 12.3 and for scheduled caste ones it is 6.44 (Table 5).

The composite scores of the districts on the top and those at the bottom are roughly in the ratio of 5:1 among non-scheduled households and 3:1 among scheduled caste households. The differentiation between two segments of population in favour of non-scheduled castes is quite wide on modernization level whereas on the count of status of women a reverse scenario was found (Table 6). The scheduled caste households have left behind non-scheduled caste households on the level of status of women. There was hardly any difference between two segments of population as regards the quality of life reflected in economic wellbeing. This could be due to weak

selection of indicators. More refined indicators like the number of each asset owned by the households belonging to both segments of population could have displayed more accurate economic wellbeing levels.

Conclusions

The non-scheduled caste households in the state enjoyed a better overall quality of life as compared to their counterparts. They were way ahead of scheduled castes on the count of modernization level, quite close on economic wellbeing and lagged behind on status of women. The non-scheduled caste households within Panchkula, Gurgaon and Faridabad districts were way ahead than the scheduled castes in terms of quality of life. In Mahendragarh and Palwal districts the difference in the quality of life of non-scheduled castes and scheduled caste was quite narrow again it was in favour of non-scheduled castes.

Panchkula, Ambala, Yamunanagar, Karnal, Panipat districts in eastern Haryana are noted for relatively higher quality of life in general largely due to higher proportion of urban population, agricultural development, good transport connectivity, diversification of economy, industrial development and higher levels of literacy. In addition to this, Faridabad and Gurgaon districts are relatively more developed due to higher level of urbanization, industrial development, their strategic location along the highway and close proximity of Faridabad and Gurgaon to the national capital region of Delhi and Panchkula to the State capital of Chandigarh. Contrary to this, the southern part including Mewat, Mahendragarh, Palwal displays a lower level of quality of life due to the associated factors of lower urbanization, higher proportion of Muslim population having social and economic backwardness, low levels of literacy, low industrial development, their remote location away from the national capital region and state capital and poor connectivity with other parts of the state. The correlates of the quality of life of non-scheduled castes and scheduled castes revealed the pre-eminence of factor of urbanization followed by per capita income and percentage of non-agricultural workers in rural areas. The scheduled caste population shared a lower degree of quality of life in areas of their heavy concentration.

The relative lower quality of life among scheduled castes in the state not only depicts their poor income level status but also lack of access to various services like education, health, water supply and public distribution. It is evident that the gaps between scheduled castes and the rest of the population are quite large in terms of modernization levels despite special earmarking of funds for scheduled castes in various development programmes. Focus should be given at improving the access to housing facilities to rejuvenate enhancement of overall quality of life among both the social groups. However, to reduce the gap among both these two social groups, the rate of change needs to be greater for scheduled castes who are lagging behind in their access to most of amenities. In order to reduce the regional disparities in the quality of life a large scale industrial development in underdeveloped districts in the state with good transportation and communication network needs to be planned by the state government.

Acknowledgement

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SPATIAL PATTERNS OF LITERACY DIFFERENTIALS IN HARYANA (2011): A REGIONAL PERSPECTIVE

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Chandigarh, India

Abstract

This paper attempts to examine the spatial variations and differentials in the levels of literacy on the basis of analysis of data from Primary Census Abstract of Haryana, 2011. The unit of analysis is *tahsil*. The differentials in literacy level by sex, residence and caste have been computed by using Krishan and Shayam's Index of Differential in literacy. The study reveals that overall there is a significant increase in literacy rates in the state, from 26.89 per cent to 75.55 per cent between 1971 and 2011. There is a significant difference in literacy rates between males and females in both rural and urban areas of the *tahsils*. Male literacy rates are substantially higher as compared to females in both rural and urban areas in every *tahsil*. The overall spatial pattern of literacy shows notable regional variations ranging from 87.02 per cent in Gurgaon *tahsil* to 49.26 per cent in Punahana *tahsil* of Mewat district. The variation in male literacy is from 92.39 per cent in Manesar *tahsil* to 65.79 per cent in Punahana *tahsil* and in female literacy from 72.17 per cent in Manesar *tahsil* to 31.09 per cent in Punahana. The differential values in male-female literacy range from 0.70 points in Punahana *tahsil* to 0.10 points in Gurgaon *tahsil*. The rural-urban differential in literacy ranges from 0.37 in Punahana *tahsil* to 0.01 points in Loharu *tahsil*. In the case of scheduled caste and non-scheduled caste population it is 0.05 points in Bilaspur *tahsil* and 0.34 in Ratia *tahsil*.

I knew Prof. G.S. Gosal as father of Prof. R.P.S. Gosal, my Ph.D. supervisor. He briefly taught us Geographical Thought when Prof. Swarnjit Mehta, who was currently teaching this course, proceeded on leave. After he was awarded the status of Professor Emeritus by the Panjab University, the three of us used to have tea in Prof. R.P.S. Gosal's room. He enjoyed having his tea. Later on I discovered that he enjoyed whatever he did.

After Prof. R.P.S. Gosal's sudden and untimely demise I came close to Prof. G.S. Gosal and he went out of his way to help me in writing my Ph.D. thesis, for which I will always remain indebted to him.

Introduction

Literacy and education play a pivotal role in awakening an individual against socio-economic and political marginalization. The socio-economic status of a man is influenced by the levels of education (Gosal, 1967). According to the Census of India a person who can read and write with understanding in any language is considered as literate. All children below the age of 6 years have been treated as illiterate. Among the important factors associated with resource development, education is the most pivotal. The extension of education facilities to all regions, all social groups and to both men and women received priority consideration in developmental planning in all the

Table-1: India : Literacy Rates (2011)

State/UT	Total			Rural			Urban		
	Persons	Male	Female	Persons	Male	Female	Persons	Male	Female
Jammu & Kashmir	67.16	76.75	56.43	63.18	73.76	51.64	77.12	83.92	69.01
Himachal Pradesh	82.80	89.53	75.93	81.85	89.05	74.62	91.10	93.42	88.37
Punjab	75.84	80.44	70.73	71.42	76.62	65.74	83.18	86.67	79.21
Chandigarh	86.05	89.99	81.19	80.75	85.77	73.17	86.19	90.11	81.38
Uttarakhand	78.82	87.40	70.01	76.31	86.62	66.18	84.45	89.05	79.25
Haryana	**75.55**	**84.06**	**65.94**	**71.42**	**81.55**	**60.02**	**83.14**	**88.63**	**76.90**
Nct of Delhi	86.21	90.94	80.76	81.86	89.37	73.10	86.32	90.98	80.95
Rajasthan	66.11	79.19	52.12	61.44	76.16	45.80	79.68	87.91	70.73
Uttar Pradesh	67.68	77.28	57.18	65.46	76.33	53.65	75.14	80.45	69.22
Bihar	61.80	71.20	51.50	59.78	69.67	49.00	76.86	82.56	70.49
Sikkim	81.42	86.55	75.61	78.95	84.62	72.45	88.71	92.35	84.70
Arunachal Pradesh	65.38	72.55	57.70	59.94	67.44	52.04	82.93	88.45	76.66
Nagaland	79.55	82.75	76.11	75.35	78.96	71.51	89.62	91.62	87.40
Manipur	76.94	83.58	70.26	73.40	80.29	66.34	85.38	91.68	79.31
Mizoram	91.33	93.35	89.27	84.10	88.16	79.81	97.63	97.98	97.27
Tripura	87.22	91.53	82.73	84.90	90.07	79.49	93.47	95.51	91.38
Meghalaya	74.43	75.95	72.89	69.92	71.46	68.37	90.79	92.46	89.14
Assam	72.19	77.85	66.27	69.34	75.40	63.03	88.47	91.81	84.94
West Bengal	76.26	81.69	70.54	72.13	78.44	65.51	84.78	88.37	80.98
Jharkhand	66.41	76.84	55.42	61.11	72.86	48.91	82.26	88.44	75.47
Odisha	72.87	81.59	64.01	70.22	79.65	60.74	85.75	90.72	80.42
Chhattisgarh	70.28	80.27	60.24	65.99	76.98	55.06	84.05	90.58	77.24
Madhya Pradesh	69.32	78.73	59.24	63.94	74.74	52.43	82.85	88.67	76.52
Gujarat	78.03	85.75	69.68	71.71	81.61	61.36	86.31	90.98	81.03
Daman & Diu	87.10	91.54	79.55	81.36	89.43	71.93	88.96	92.10	82.88
Dadra & Nagar Haveli	76.24	85.17	64.32	64.12	76.40	49.58	89.79	93.99	83.38
Maharashtra	82.34	88.38	75.87	77.01	85.15	68.54	88.69	92.12	84.89
Andhra Pradesh	67.02	74.88	59.15	60.45	69.38	51.54	80.09	85.79	74.35
Karnataka	75.36	82.47	68.08	68.73	77.61	59.71	85.78	90.04	81.36
Goa	88.70	92.65	84.66	86.65	91.71	81.63	89.95	93.21	86.56
Lakshadweep	91.85	95.56	87.95	91.58	94.53	88.50	91.92	95.84	87.79
Kerala	94.00	96.11	92.07	92.98	95.35	90.81	95.11	96.95	93.44
Tamil Nadu	80.09	86.77	73.44	73.54	82.04	65.05	87.04	91.80	82.31
Puducherry	85.85	91.26	80.67	80.10	87.44	73.02	88.49	93.03	84.17
A & N Islands	86.63	90.27	82.43	84.50	88.53	79.85	90.10	93.11	86.63
India	**72.98**	**80.88**	**64.63**	**67.77**	**77.15**	**57.93**	**84.11**	**88.76**	**79.11**

Source: Computed from Primary Census Abstract of India, 2011.

countries which are among the most advanced today. India has a great disparity in literacy level between rural and urban areas and between males and females. There are wide spatial, sectional and male-female differentials in this regard. In India, as per 2011 census, 72.98 per cent of the population is literate. With 94.00 per cent of its population recorded as literate Kerala leads all other states and union territories in the country followed by Lakshadweep (91.85 per cent), Mizoram (91.33 per cent), Goa (78.87 per cent), Tripura (87.22 per cent), Daman & Diu (87.10 per cent), Andaman & Nicobar Islands (86.63 per cent), Delhi (86.21 per cent) and Chandigarh (86.05 per cent). But these are very small areal units and account for only a small fraction of the country's total population (4.80 per cent). Large states like Uttar Pradesh (67.68 per cent), Andhra Pradesh (67.02 per cent), Rajasthan (66.11 per cent), Jharkhand (66.41 per cent) and Bihar (61.80 per cent) are way behind in their literacy rates. Further, the male-female differences in literacy rates have a wide range of variation (Table 1). In Bihar, Rajasthan, Jharkhand, Jammu and Kashmir and Uttar Pradesh female literacy rates are woefully low (between 50 to 57 per cent). In India as a whole, while 80.88 per cent of the males are literate, the corresponding figure for the females is only 64.63 per cent. Likewise, the rural and urban areas stand apart in literacy (67.77 per cent of population in rural area and 84.11 per cent in urban areas). In Bihar, Arunachal Pradesh, Andhra Pradesh, Jharkhand and Rajasthan the rural literacy rates range between 59 to 61 per cent while in Kerala it is as high as 92.98 per cent. The situation with regard to rural female literacy rates is far worse and spatial disparities therein far larger. Whereas in Kerala as much as 90.81 per cent of females in villages can read and write, the corresponding figures for Rajasthan, Jharkhand, Bihar, Andhra Pradesh, Jammu & Kashmir, Arunachal Pradesh and Madhya Pradesh are as low as 45.50 per cent, 48.91 per cent, 49.00 per cent, 51.54 per cent, 51.64 per cent, 52.04 per cent and 52.43 per cent respectively. On the other hand, in the urban areas literacy rates are much higher and inter-state differences smaller. In urban India as a whole 88.76 per cent of the males and 79.11 per cent of the females are literate. In Kerala, Lakshadweep, Tripura, Himachal Pradesh, Goa and Meghalaya urban male literacy is 96.95 per cent, 95.84 per cent, 95.51 per cent, 93.42 per cent, 93.21 per cent and 92.46 per cent respectively. In comparison the urban female rates in these states are 93.44 per cent, 87.79 per cent, 91.38 per cent, 88.37 per cent, 86.56 per cent, and 89.14 per cent respectively (Table 1). These figures bring out clearly that literacy is far more diffused among males and females in the urban areas and male-female differences are relatively small.

The study of literacy is of immense significance. Chandna (2012) stated that literacy is essential for eradicating poverty and mental isolation, for cultivating peaceful and friendly international relations and for permitting the free play of demographic processes. Illiteracy, on the other hand, takes away from man his dignity, perpetuates ignorance, poverty and mental isolation, deters peaceful and friendly international relations and free demographic processes and hampers social advancement, economic growth and political maturity. No wonder, the trends in literacy are considered as an index of the pace at which the socio-economic transformation of a society is taking place. Thus, the analysis of literacy patterns has considerable significance.

Haryana had 16.59 million literate persons in 2011 comprising 75.55 per cent of its population as compared to 72.98 per cent in India (Table 2). In the census year 1971, barely one-third (26.89 per cent) of the state population, which was lower than the national average (29.46 per cent) in that year could read and write. The literacy rate has grown from 26.89 per cent in 1971 to 75.55 per cent in 2011 within a span of four decades.

The study of literacy is not entirely a new field of research. Gosal (1964) studied the spatial distribution of literacy in India, regional aspects of rural literacy in India (1967) and spatial perspective on literacy in India (1979). Besides these, a number of studies by several geographers

Table - 2: Literacy Rates: India and Haryana (1971-2011)

Census Year	India	Per cent Change	Haryana	Per cent Change
1971	29.46	-	26.89	-
1981	36.23	6.77	35.84	8.95
1991	42.84	6.61	55.85	20.01
2001	55.18	12.34	67.90	12.05
2011	72.98	17.8	75.55	7.65

Source: Computed from Primary Census Abstract of India and Haryana, 1971-2011.

have also come out on different states of India *viz.*, Krishan and Shayam (1973, 1977 and 1978) on India as a whole, Krishan and Chandna (1974) on Haryana, Siddique (1977) on Uttar Pradesh, Sharma and Gupta (1995) on Chhattisgarh, Bhardwaj (1999) on Himachal Pradesh, Joshi (1999 and 2000) on Rajasthan, Shafiqullah (2011) on Uttar Pradesh and Kaur (2013) on Rajasthan, but there are only a few studies conducted on Haryana. It is very interesting to note that despite a predominantly agricultural economy and rural population, the state has been able to perform so well on its literacy front. Though some literature is available on literacy in Haryana but the unit of analysis in these studies is district. This study deals with differentials in literacy at *tahsil* level in Haryana in order to capture the intra and inter-district variations in literacy patterns and differentials.

Objectives and Methodology

The objectives of this paper are (i) to examine the patterns in literacy and (ii) to study the differentials in literacy by sex (male and female), residence (rural and urban) and caste (scheduled and non-scheduled) in the state of Haryana in a spatial perspective. The analysis is based on data from Primary Census Abstract of Haryana, 2011. *Tahsil* is taken as the unit of analysis. The literacy rate refers to the percentage of literate population to total population (excluding 0-6 population). Differential Index in literacy by sex, residence and caste has been computed by using Krishan and Shayam's method as given below:

$$DI = \frac{X2 - X1}{T}$$

Where:

DI = Differential Index

X2 = Percentage of literates in male, urban and scheduled caste population

X1 = Percentage of literates in female, rural and non-scheduled caste population

T = Percentage of literates in total population

Higher the value of the index, the greater is the disparity and *vice-versa*. The results obtained from processing of data are presented in the form of tables and choropleth maps. The Administrative Divisions of Haryana are depicted in Fig.1.

Overview of Literacy

According to 2011 Census 75.55 per cent of the total population in Haryana was literate. The literacy rates for males and females were 84.06 per cent and 65.94 per cent respectively. Literacy rate of urban population was notably higher (83.14 per cent) than that of the rural population (71.42 per cent).

As a whole, the literacy rate during 1971-2011 in Haryana has increased by 48.66 percentage points. The rate of decennial increase during 1971-1991 was higher than the national average, almost equal to it during 1991-2001 and lower than the national average during 2001-2011 (Table 2).

Table 3 shows the literacy rates for general, male and female population by caste and residence

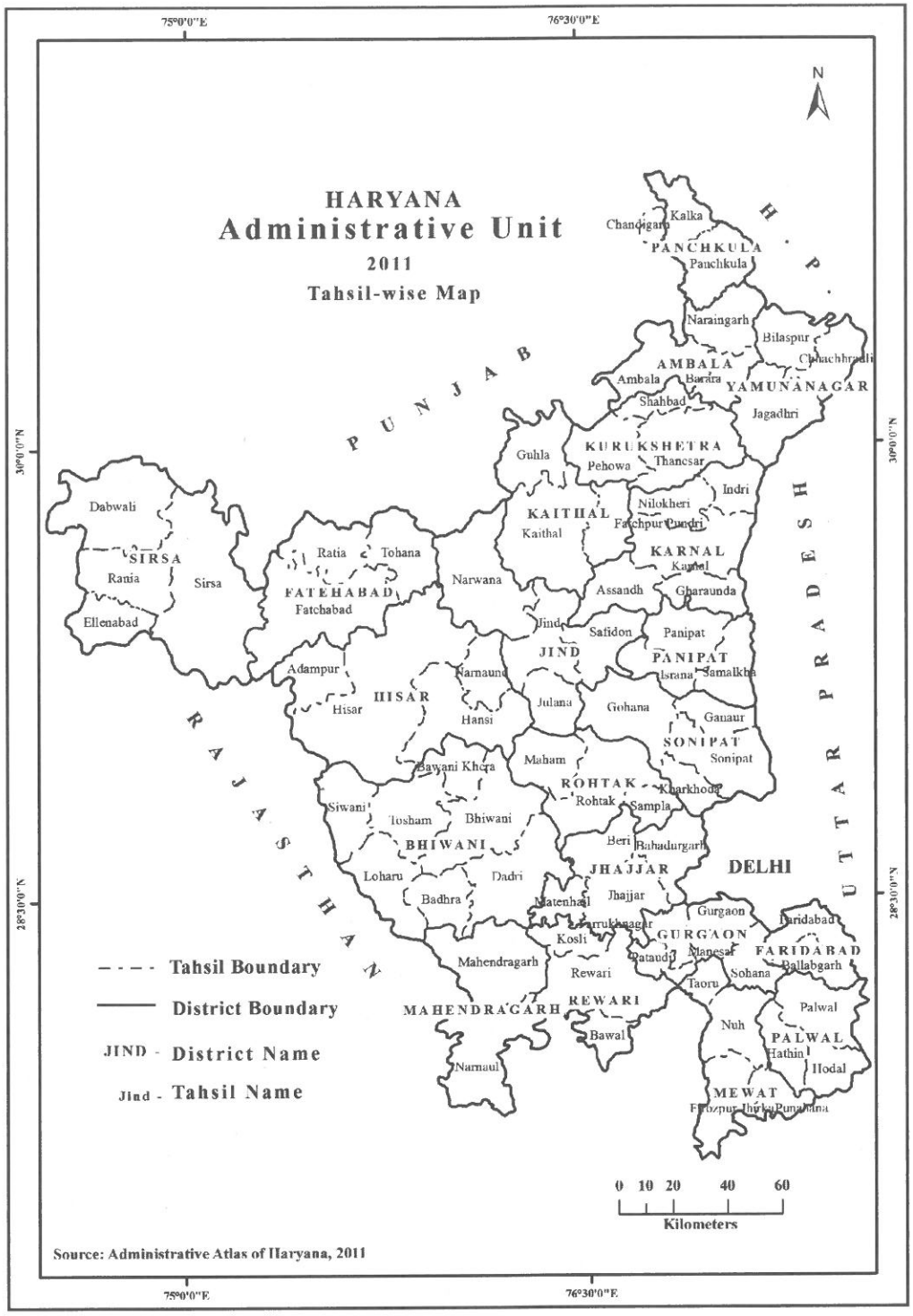
HARYANA
Administrative Unit
2011
Tahsil-wise Map
75°0'0"E
76°30'0"E
30°0'0"N
28°30'0"N
N
PUNJAB
HIMACHAL PRADESH
UTTAR PRADESH
RAJASTHAN
DELHI
PANCHKULA
Kalka
Panchkula
AMBALA
Ambala
Barara
YAMUNANAGAR
Naraingarh
Bilaspur
Jagadhri
Shahbad
KURUKSHETRA
Guhla
Pehowa
Thanesar
KAITHAL
Kaithal
Nilokheri
Indri
Fatehpur Gundri
KARNAL
Karnal
Assandh
Gharaunda
Panipat
PANIPAT
Israna
Samalkha
Safidon
JIND
Jind
Narwana
SIRSA
Rania
Sirsa
Dabwali
Ellenabad
FATEHABAD
Ratia
Tohana
Fatehabad
HISAR
Hisar
Adampur
Narnaund
Hansi
Julana
Gohana
Ganaur
SONIPAT
Sonipat
Maham
Bawani Khera
ROHTAK
Rohtak
Kharkhoda
Sampla
Siwani
Tosham
Bhiwani
BHIWANI
Beri
Bahadurgarh
JHAJJAR
Jhajjar
Loharu
Dadri
Badhra
Matenhail
Farrukhnagar
Gurgaon
Faridabad
GURGAON
Kosli
Pataudi
Manesar
FARIDABAD
Ballabgarh
Mahendragarh
Rewari
Sohana
Taoru
REWARI
MAHENDRAGARH
Palwal
Nuh
Bawal
PALWAL
Hathin
Hodal
Narnaul
MEWAT
Firozpur Jhirka
Punahana
Tahsil Boundary
District Boundary
JIND - District Name
Jind - Tahsil Name
0 10 20 40 60
Kilometers
Source: Administrative Atlas of Haryana, 2011

Fig.1

Table - 3: Haryana : Literacy Rates of Scheduled and Non- Scheduled Caste Population (2011)

Percentage of Literates			
Population	**Total**	**Scheduled Caste**	**Non-Scheduled Caste**
Persons	75.55	66.85	77.70
Males	84.06	75.93	86.06
Females	65.94	56.65	68.25
Rural			
Persons	71.42	65.75	73.04
Males	81.55	75.10	83.40
Females	60.02	55.20	61.39
Urban			
Persons	83.14	69.78	85.57
Males	88.63	78.14	90.52
Females	76.90	60.46	79.93

Source: Computed from Primary Census Abstract of Haryana, 2011.

for 2011. For the state as a whole, the literacy rate for males was much higher (84.06 per cent) than that of females (65.94 per cent). There is a difference of 18.12 per cent points in male and female literacy in the state. Thus, the literacy rates are biased in favour of males in the state. A similar trend is visible in rural and urban areas. The male-female difference in literacy in rural areas (21.53 per cent points) is higher than the value for urban areas (11.73 per cent points). Similarly, male-female difference is 19.28 per cent points for Scheduled Caste population whereas it is 17.81 per cent points for non-Scheduled population. Among the non-Scheduled Caste population the literacy difference in urban male-female is quite low (10.59 per cent points) as compare to rural i.e. 22.01 per cent. In urban areas literacy rates were much higher than rural areas due to better availability of educational facilities and higher number of educational institutions. The literacy rates among scheduled caste and non-scheduled caste population are 66.85 per cent and 77.70 per cent respectively. The literacy rates among scheduled caste and non-scheduled caste males were 75.93 per cent, 86.06 per cent respectively. The comparative figures for females were 56.65 per cent and 68.25 per cent respectively. The scheduled caste literacy in rural population is comparatively low (65.75 per cent) as compared to urban areas (69.78 per cent).

Spatial Patterns of Literacy

On the basis of tahsil level analysis of data the following three types of areas can be identified (Fig 2):

A. Areas of high literacy (more than 74.00 per cent);

B. Areas of moderate literacy (70.00 to 74.00 per cent); and

C. Areas of low literacy (less than 70.00 per cent).

Areas of High Literacy

There is a wide range in the levels of literacy under this category, and this category may be further split into two sub-categories for a better understanding:

(a) Areas with more than 78.00 per cent literacy termed as areas of very high literacy, and

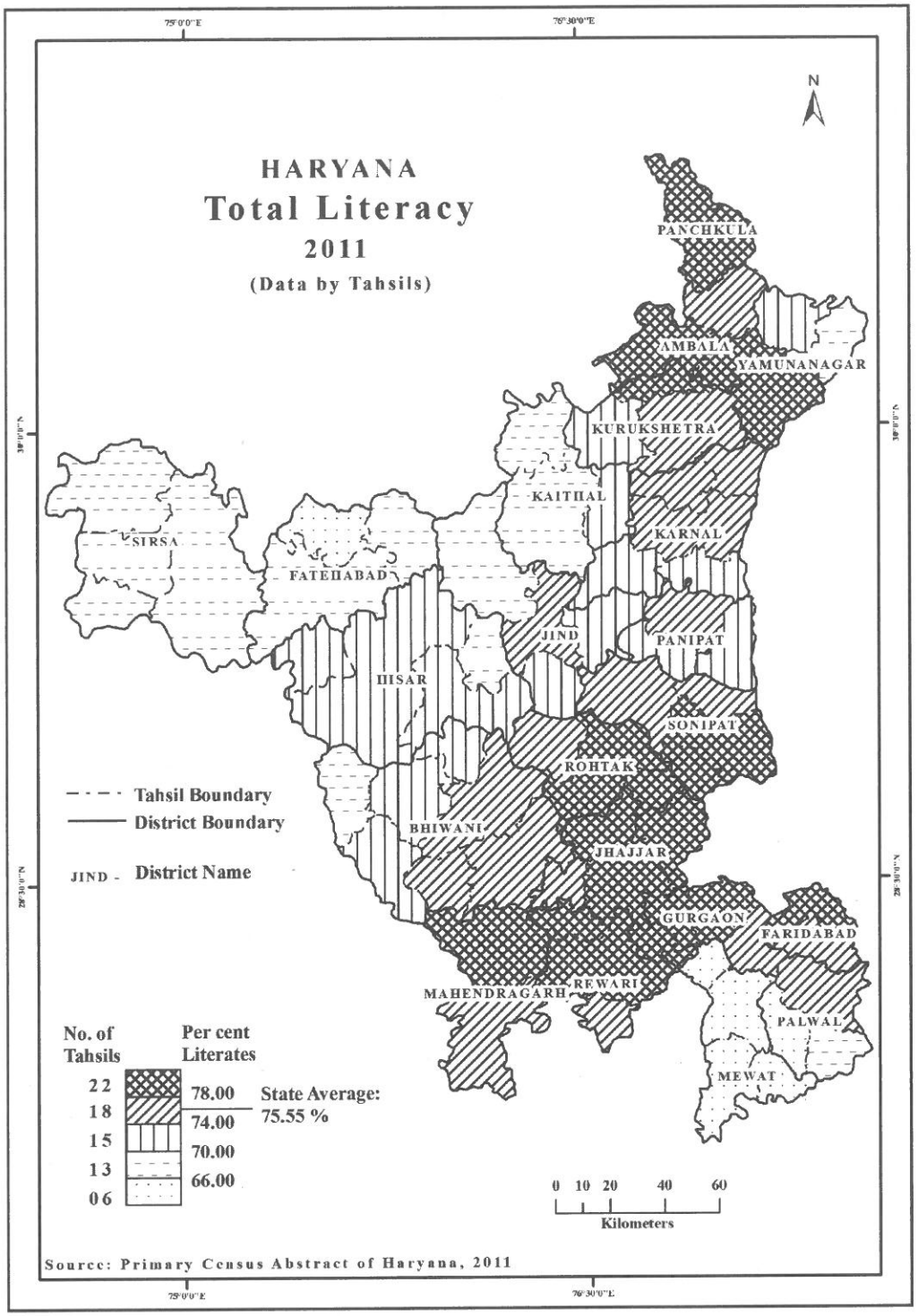
HARYANA
Total Literacy
2011
(Data by Tahsils)
N
PANCHKULA
AMBALA
YAMUNANAGAR
KURUKSHETRA
KAITHAL
KARNAL
SIRSA
FATEHABAD
JIND
PANIPAT
HISAR
SONIPAT
ROHTAK
BHIWANI
JHAJJAR
GURGAON
FARIDABAD
REWARI
MAHENDRAGARH
PALWAL
MEWAT
Tahsil Boundary
District Boundary
JIND - District Name
No. of Tahsils
Per cent Literates
22 78.00
18 74.00
15 70.00
13 66.00
06
State Average: 75.55 %
0 10 20 40 60
Kilometers
Source: Primary Census Abstract of Haryana, 2011

Fig. 2

Table - 4: Haryana: Tahsil-wise Literacy Rate, Urban Population, Non-Agricultural Workers and Number of Schools (2011)

Category	Tahsil Name	Literacy Rate*	Per cent Urban Population to total Population	Per cent Non-Agricultural Workers to total Population	No. of Schools (Govt. and Private)
Very High Literacy Rates	Gurgaon	87.02	93.11	35.77	685
	Ambala	84.15	67.14	28.83	907
	Manesar	83.57	20.11	27.79	181
	Bahadurgarh	82.84	44.01	22.84	464
	Faridabad	82.58	89.95	30.45	638
	Panchkula	81.98	60.86	31.06	537
	Rewari	81.92	32.15	24.18	1102
	Kalka	81.67	43.98	29.66	358
	Rohtak	81.66	55.17	21.83	971
	Sonipat	81.51	46.04	22.86	1105
	Farrukhnagar	80.81	10.02	18.22	306
	Jagadhri	80.64	51.05	24.16	1041
	Jhajjar	80.31	19.23	14.18	599
	Pataudi	80.18	34.43	18.92	286
	Kosli	80.17	07.83	18.38	224
	Sampla	80.17	16.61	15.99	193
	Barara	79.03	12.15	15.50	509
	Beri	78.94	10.23	12.62	213
	Shahbad	78.82	32.73	17.89	261
	Kharkhoda	78.55	15.57	16.50	332
	Mahendragarh	78.27	10.42	14.70	740
	Sohna	78.00	32.58	19.48	289
High Literacy Rates	Naraingarh	77.70	13.54	15.37	438
	Panipat	77.63	65.10	26.84	162
	Thanesar	77.62	31.78	20.46	897
	Dadri	77.49	14.66	14.61	307
	Narnaul	77.30	17.53	17.71	1074
	Bhiwani	77.26	35.41	18.70	886
	Bawal	77.17	12.90	21.48	1102
	Karnal	77.16	45.99	22.69	854
	Matenhail	76.83	0.00	14.80	312
	Gohana	76.53	17.66	14.61	715
	Ganaur	76.01	17.21	17.33	393
	Ballabgarh	75.05	2.00	17.00	411
	Maham	75.03	10.09	16.52	449
	Jind	74.94	35.15	17.05	832
	Palwal	74.64	31.69	17.27	1012

	Nilokheri	74.62	21.19	14.81	394
	Indri	74.44	10.76	11.41	318
	Badhra	74.15	0.00	12.26	307
Moderate Literacy Rates	Hisar	73.89	39.65	19.31	1501
	Julana	73.40	15.71	13.23	224
	Bilaspur	73.12	14.24	14.00	371
	Safidon	73.04	15.90	13.48	522
	Loharu	72.99	08.72	09.30	466
	Samalkha	72.83	12.99	17.03	531
	Bawani Khera	72.73	15.97	09.94	192
	Hansi	72.48	22.43	13.25	499
	Israna	72.36	0.00	12.31	162
	Pehowa	72.01	20.59	15.75	511
	Tosham	71.72	08.13	09.48	444
	Gharaunda	71.16	20.10	17.05	267
	Fatehpur Pundri	70.72	14.12	11.98	415
	Adampur	70.59	17.37	11.14	234
	Assandh	70.40	11.63	11.45	381
Low Literacy Rates	Sirsa	69.99	28.53	16.26	1028
	Chhachhrauli	69.94	06.05	12.70	300
	Siwani	69.70	19.11	10.87	241
	Fatehabad	69.66	14.19	14.03	704
	Hodal	69.30	23.08	14.62	566
	Kaithal	69.18	25.48	16.14	967
	Narnaund	68.83	12.24	08.66	221
	Ellenabad	67.97	27.69	14.94	215
	Tohana	67.65	27.17	15.80	434
	Rania	67.63	14.3	16.96	233
	Guhla	67.16	19.95	14.43	338
	Dabwali	66.93	19.59	11.67	436
	Narwana	66.70	16.29	12.32	635
Very Low Literacy Rates	Taoru	65.15	17.15	16.13	243
	Ratia	63.46	20.69	15.15	233
	Hathin	58.66	05.36	11.47	340
	Nuh	55.36	07.66	11.56	331
	Ferozepur Jhirka	51.59	10.53	10.84	411
	Punahana	49.26	12.79	11.34	271
	Haryana	**75.55**	**23.69**	**16.86**	**37671**

Source: Computed and Compiled from Primary Census Abstract and District Census Handbook of Haryana, 2011.
** Literacy rates are arranged in descending order.*

(b) Areas with a literacy rate between 74.00 and 78.00 per cent termed as areas of high literacy.

(a) There are two concentrations of areas where literacy rate is more than 78.00 per cent (Fig. 2). Such areas cover 22 *tahsils* out of the 74 *tahsils* in the state. One concentration comprises National Capital Region and the other concentration is located around the state capital Chandigarh. The first area includes *tahsils* Mahendragarh in Mahendragarh district, Kharkhoda and Sonipat in Sonipat district, Shahbad in Kurukshetra district, Sampla and Rohtak in Rohtak district, Beri and Jhajjar in Jhajjar district, Kosli and Rewari in Rewari district, Farrukhnagar, Sohna, Pataudi, Gurgaon, Bahadurgarh and Manesar in Gurgaon district and Faridabad in Fridabad district. The second concentration includes Kalka and Panchkula *tahsils* in Panchkula district, Ambala and Barara in Ambala district and Jagadhri in Yamunanagar district. The major contributing factors responsible for relatively high literacy rates in these areas are early start in the field of education as well as easy access to educational facilities. The high literacy rates in these *tahsils* are mainly associated with high proportion of non-agricultural workers and high degree of urbanization. These *tahsils* have an average urbanization of 36.61 per cent, non-agricultural workers 21.90 per cent and 36.60 per cent of the total schools in the state. In these *tahsils* the range of urban population varies between 93.11 per cent in Gurgaon *tahsil* to 7.83 per cent in Kosli *tahsil*. Similarly, the range of non-agricultural workers varies between 35.77 per cent in Gurgaon *tahsil* to 12.62 per cent in Beri *tahsil* (Table 4). The non-agricultural workers in these *tahsils* are mainly engaged in household industries and other government services contributing to high literacy since the nature of jobs they perform require some level of educational attainment. The National Capital Region comprised of Sonipat, Rohtak, Jhajjar, Gurgaon and Faridabad districts is known for notable educational institutions *viz.*, Deenbandhu Chhotu Ram University of Science and Technology in Sonipat district, Maharishi Dayanand University in Rohtak district. The region of Panchkula, Ambala and Yamunanagar districts owes its high literacy rate due to the influence of Chandigarh city, Panchkula city and Kurukshetra city which have world level educational institutions i.e., Panjab University, Chandigarh and Kurukshetra University, Kurukshetra. Jagadhri *tahsil*, by comparison, has a high literacy rate due to well developed road network which has facilitated easy access to the educational institutions in the vicinity or in neighbouring *tahsils*.

(b) Adjoining the two concentrations discussed above are located the *tahsils* having literacy rates ranging between 74.00 per cent and 78.00 per cent. There are 18 *tahsils* in this category namely Badhra, Bhiwani and Dadri in Bhiwani district, Indri, Nilokheri and Karnal in Karnal district, Palwal in Palwal district, Jind in Jind district, Maham in Rohtak district, Ballabgarh in Faridabad district, Ganaur and Gohana in Sonipat district, Matenhail in Jhajjar district, Bawal in Rewari district, Narnaul in Mahendragarh district, Thanesar in Kurukshetra district, Panipat in Panipat district and Naraingarh in Ambala district. In these *tahsils* the proportion of urban population ranges from 65.10 per cent in Panipat *tahsil* to 2.00 per cent in Ballabgarh *tahsil*. The values for non-agricultural workers vary between 26.84 per cent in Panipat *tahsil* to 11.41 per cent in Indri *tahsil* (Table 4). The non-agricultural activity in these areas is mainly associated with transport and marketing services. Similarly, the establishment of a thermal plant, oil refinery and sugar industries provides employment in non-agricultural sector.

Areas of Moderate Literacy

This category includes *tahsils* having literacy rates between 70.00 to 74.00 per cent (Fig. 2). This category includes 15 out of 74 *tahsils* which extend from east to west in the central parts of the state. These *tahsils* are Julana and Safidon in Jind district, Assandh and Gharaunda in Karnal district, Fatehpur Pundri in Kaithal district, Pehowa in Kurukshetra district, Israna and

Samalkha in Panipat district, Bilaspur in Yamunanagar district, Adampur, Hisar and Hansi in Hisar district, Bawani Khera and Loharu in Bhiwani district. Among the *tahsils* in this category the levels of urbanization vary between 39.65 per cent in Hisar *tahsil* to 08.13 per cent in Tosham *tahsil* and the proportion of non-agricultural workers is between 19.31 per cent in Hisar *tahsil* to 09.30 per cent to Loharu *tahsil* of Bhiwani district (Table 4). These *tahsils* have a moderate level of urbanization due to their close proximity of one or the other large urban-industrial centre such as Hansi near Hisar city, Pehowa near Thanesar and Gharaunda near Karnal city. These *tahsils* are located between areas having high and low literacy in the state. It was observed that *tahsil* Israna in Panipat district is entirely rural and has a moderate level of literacy. In the *tahsils* in this category moderate literacy is generally associated with a low proportion of non-agricultural workers.

Areas of Low Literacy

This category is also split into two sub-categories (Table 4 and Fig. 2): (a) Areas with literacy rates ranging between 66.00 and 70.00 per cent termed as areas of low literacy, and (b) Areas with less than 66.00 per cent literacy termed as areas of very low literacy.

(a) The areas of low levels of literacy are located along the inter-state border of Punjab and Rajasthan states. Interestingly the adjoining *tahsils* in these two states also have comparable low levels of literacy between 67.57 per cent in Samana *tahsil* of Punjab to 69.13 per cent in Rajgarh *tahsil* of Rajasthan. There are thirteen *tahsils* in the category *viz.*, Sirsa, Dabwali, Rania and Ellenabad in Sirsa district, Chhachhrauli in Yamunanagar district, Siwani in Bhiwani district, Fatehabad and Tohana in Fatehabad district, Hodal in Palwal district, Kaithal and Guhla in Kaithal district, Narnaund in Hisar and Narwana in Jind district. The literacy rate among these *tahsils* varies between 69.99 per cent in Sirsa *tahsil* to 66.70 per cent in Narwana *tahsil*. All these *tahsils* have a literacy rate lower than the state average (75.55 percent). Similarly these *tahsils* have lower levels of urbanization and non-agricultural workers as compared to the state average ranging from 28.53 per cent in Sirsa *tahsil* to 6.05 per cent in Chhachhrauli *tahsil* and 16.96 per cent in Rania *tahsil* to 8.66 per cent in Narnaund *tahsil* respectively (Table 4). In this region a large proportion of workers is engaged in primary occupational activities. The out-migration of educated youth in search of employment and low level of urban-industrial development are the main associations for low literacy rates.

(b) There are six *tahsils* with a very low level of literacy *viz.*, Taoru, Nuh, Ferozpur Jhirka, Punhana forming Mewat district and Hathin in Palwal district together comprising a contiguous patch of very low literacy in extreme south of Haryana. One *tahsil*, Ratia in Fatehabad district, located along the iner-state border with Punjab in the north, forms an isolated patch (Fig.2). In these *tahsils* literacy rates are less than 66.00 per cent i.e. much below the state average of 75.55 per cent. The major reasons associated with very low literacy are (i) pre-dominance of Muslim population in the case of Mewat district; (ii) economic backwardness; (iii) low proportion of non-agricultural workers and low degree of urbanization. The Mewat region is dominated by Meo population who are socio-economically backward and do not encourage educational development and social upliftment. Between these *tahsils* on an average 12.36 per cent population lives in urban areas and only 12.75 per cent workers are engaged in non-agricultural activity. In these six *tahsils* there are only 1829 (4.85 per cent) government and private schools out of the total 37671 schools in Haryana (Table 4). Large family size, low diversification of economy, prejudices against female education, low mobility among females for education and employment and poor infra- structural facilities for education are the other associated factors responsible for very low literacy rates in this region.

Table - 5 : Haryana: Tahsil-wise Literacy Differential Index* (2011)

Tahsil Name	District	Male-Female*	Urban-Rural	SC-Non SC
Punahana	Mewat	0.70	0.37	-0.25
Ferozepur Jhirka	Mewat	0.66	0.36	-0.26
Nuh	Mewat	0.60	0.2	-0.24
Hathin	Palwal	0.59	0.24	-0.11
Taoru	Mewat	0.46	0.27	-0.16
Hodal	Palwal	0.42	0.10	0.12
Loharu	Bhiwani	0.35	0.01	0.11
Badhra	Bhiwani	0.35	0	0.10
Narnaund	Hisar	0.34	0.09	0.16
Siwani	Bhiwani	0.34	0.07	0.13
Narnaul	Mahendragarh	0.34	0.09	0.05
Adampur	Hisar	0.33	0.11	0.15
Tosham	Bhiwani	0.33	0.11	0.10
Ballabgarh	Faridabad	0.33	0.03	0.07
Palwal	Palwal	0.33	0.10	0.11
Bawal	Rewari	0.32	0.02	0.07
Narwana	Jind	0.31	0.17	0.17
Bawani Khera	Bhiwani	0.31	0.02	0.14
Mahendragarh	Mahendragarh	0.31	0.06	0.07
Dadri	Bhiwani	0.30	0.09	0.11
Kosli	Rewari	0.30	0	0.08
Israna	Panipat	0.29	0	0.11
Matenhail	Jhajjar	0.29	0	0.08
Kaithal	Kaithal	0.28	0.18	0.18
Fatehpur Pundri	Kaithal	0.28	0.10	0.14
Julana	Jind	0.28	0.03	0.14
Fatehabad	Fatehabad	0.28	0.21	0.21
Hansi	Hisar	0.27	0.15	0.17
Beri	Jhajjar	0.27	0.03	0.11
Samalkha	Panipat	0.26	0.19	0.05
Jind	Jind	0.26	0.16	0.15
Safidon	Jind	0.26	0.12	0.14
Rania	Sirsa	0.26	0.05	0.28
Hisar	Hisar	0.26	0.19	0.19
Maham	Rohtak	0.26	0.10	0.15
Sohna	Gurgaon	0.26	0.08	0.05
Gharaunda	Karnal	0.25	0.17	0.15
Gohana	Sonipat	0.25	0.09	0.13
Ellenabad	Sirsa	0.25	0.15	0.25
Rewari	Rewari	0.25	0.06	0.08

Assandh	Karnal	0.24	0.10	0.18
Ganaur	Sonipat	0.24	0.12	0.09
Kharkhoda	Sonipat	0.24	0.02	0.12
Bhiwani	Bhiwani	0.24	0.12	0.15
Sampla	Rohtak	0.24	0.02	0.12
Jhajjar	Jhajjar	0.24	0.06	0.07
Pataudi	Gurgaon	0.24	0	0.08
Farrukhnagar	Gurgaon	0.24	0	0.07
Manesar	Gurgaon	0.24	0.10	0.08
Guhla	Kaithal	0.23	0.15	0.23
Ratia	Fatehabad	0.23	0.19	0.34
Tohana	Fatehabad	0.23	0.18	0.25
Dabwali	Sirsa	0.23	0.24	0.28
Sirsa	Sirsa	0.23	0.22	0.29
Chhachhrauli	Yamunanagar	0.22	0.23	-0.01
Nilokheri	Karnal	0.21	0.09	0.15
Indri	Karnal	0.21	0.01	0.16
Bilaspur	Yamunanagar	0.20	0.13	0.05
Pehowa	Kurukshetra	0.20	0.17	0.16
Panipat	Panipat	0.19	0.07	0.14
Sonipat	Sonipat	0.19	0.07	0.12
Bahadurgarh	Jhajjar	0.19	0.04	0.1
Naraingarh	Ambala	0.18	0.08	0.08
Barara	Ambala	0.18	0.07	0.12
Shahbad	Kurukshetra	0.18	0.09	0.17
Thanesar	Kurukshetra	0.18	0.13	0.14
Rohtak	Rohtak	0.18	0.1	0.17
Karnal	Karnal	0.17	0.16	0.17
Faridabad	Faridabad	0.16	0.16	0.18
Kalka	Panchkula	0.14	0.19	0.1
Jagadhri	Yamunanagar	0.14	0.10	0.12
Panchkula	Panchkula	0.13	0.12	0.19
Ambala	Ambala	0.12	0.14	0.15
Gurgaon	Gurgaon	0.10	0.06	0.13
Haryana		**0.27**	**0.11**	**0.14**

Source: Computed from Primary Census Abstract of Haryana, 2011.
** The index values are arranged according to Male-Female differential in literacy.*

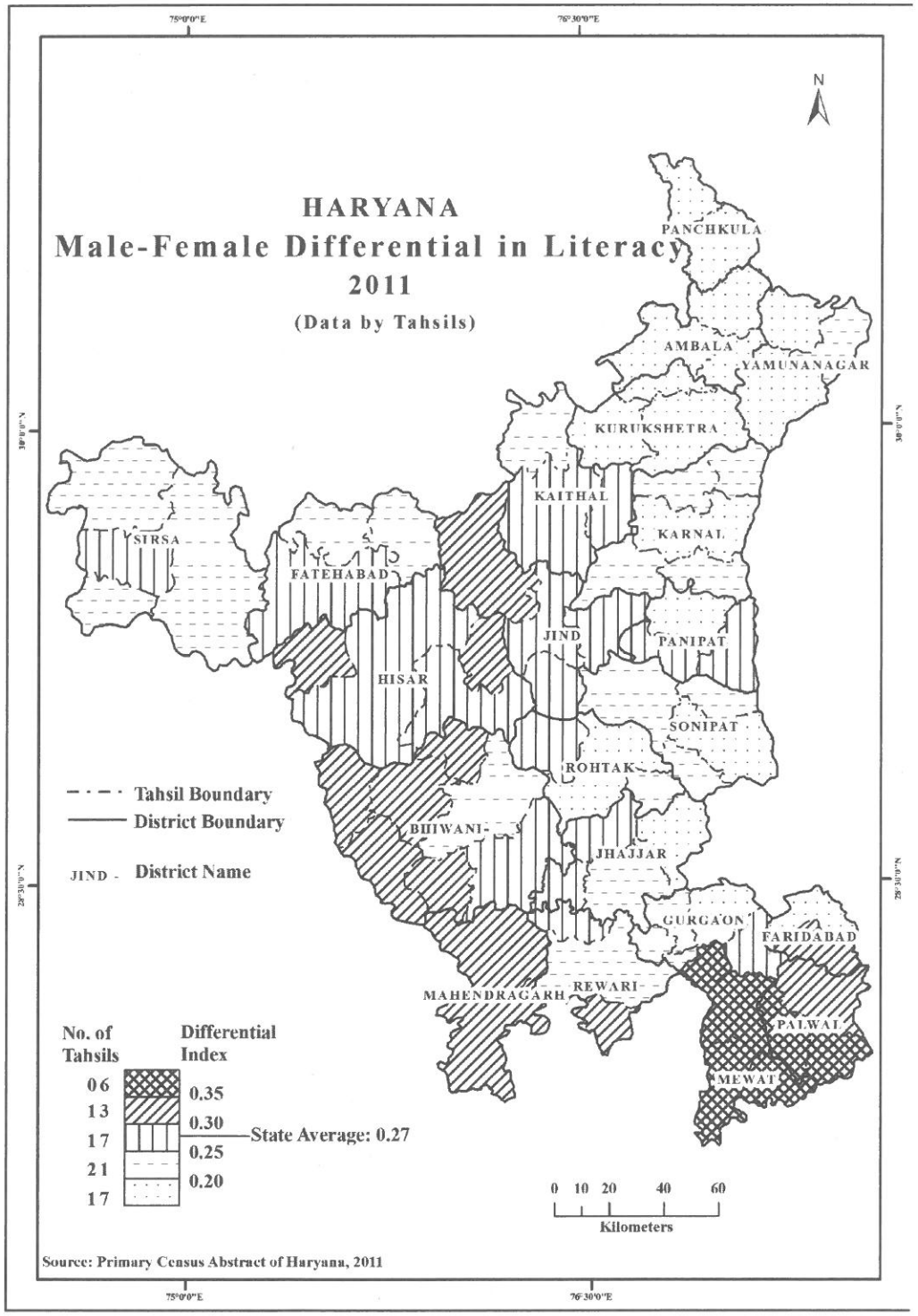
HARYANA
Male-Female Differential in Literacy
2011
(Data by Tahsils)
N
PANCHKULA
AMBALA
YAMUNANAGAR
KURUKSHETRA
KAITHAL
KARNAL
SIRSA
FATEHABAD
JIND
PANIPAT
HISAR
SONIPAT
ROHTAK
BHIWANI
JHAJJAR
GURGAON
FARIDABAD
REWARI
MAHENDRAGARH
PALWAL
MEWAT
Tahsil Boundary
District Boundary
JIND - District Name
No. of Tahsils
Differential Index
06 0.35
13 0.30
17 0.25
21 0.20
17
State Average: 0.27
0 10 20 40 60
Kilometers
Source: Primary Census Abstract of Haryana, 2011
75°0'0"E
76°30'0"E

Fig. 3

Male-Female Differential in Literacy

The state level value of the index is 0.27 (Table 5). There is considerable variation in the spatial distribution of male-female differential in literacy among the *tahsils* of the state. It varies from 0.70 in Punahana in Mewat district to 0.10 in Gurgaon *tahsil* in the district with the same name. These variations may be conveniently grouped into five categories (Fig. 3). However, for purpose of discussion the first two have been merged together and termed as (a) areas of high differential with two sub-categories i.e., (i) six *tahsils* having an index value of above 0.35 termed as areas of very high differential and, (ii) 13 *tahsils* having an index value between 0.30 and 0.35 called areas of high differential. The third category with index values ranging between 0.25 and 0.30 and covering 17 *tahsils* (Fig. 3) has been treated as an independent group and termed as (b) areas of moderate differentials. The next two categories have again been merged in to one group called (c) areas of low differential with two sub-categories i.e., (i) 21 *tahsils* having an index value between 0.20 and 0.25, termed as areas of low differential, and (ii) 17 *tahsils* having an index value below 0.20 called areas of very low differential.

The six *tahsils*, four in Mewat and two in Palwal districts forming the area of very high male-female differential, comprise a contiguous patch in the extreme south of the state. Except for Hodal *tahsil* in Palwal district, which had low literary rate, all the other *tahsils* had very low level of literacy. The thirteen *tahsils*, five in Bhiwani, two each in Mahendragarh and Hisar, and one each in Faridabad, Palwal, Rewari and Jind districts, included in the area of high male-female literacy differential index, form two contiguous patches along the south-western inter-state border of the state with Rajasthan in Bhiwani and Mahendragarh districts. Bawal *tahsil* in Rewari and Adampur *tahsil* in Hisar district also have a similar location. Palwal and Ballabhgarh *tahsils* in Palwal and Faridabad districts respectively share the inter-state border with Uttar Pradesh, and Narwana *tahsil* in Jind district shares the inter-state border with Punjab state. Most of these *tahsils* had a high or moderate level of total literacy. Interestingly, although the 17 *tahsils* having moderate male-female literacy differential index values (between 0.25 and 0.30) belong to 11 out of a total of 21 districts in the state, spatially 15 *tahsils* comprising the districts of Kaithal (two *tahsils*), Jind (three *tahsils*), Panipat (two *tahsils*), Rohtak (one *tahsil*), Jhajjar (two *tahsils*), Hisar (two *tahsils*), and one *tahsil* each from Bhiwani, Fatehabad and Rewari form a contiguous belt running from north to south and east to west in the central part of the state (Fig.3). The other two *tahsils* occur as isolated patches. There are 21 *tahsils* having an index value between 0.20 and 0.25 considered as areas of low differential. Within this group the highest value of 0.25 is in Gharaunda and the lowest, 0.20, in Indri *tahsils* both of which are in Karnal district. In most cases the *tahsils* in this group form contiguous spatial patches within the districts of their location e.g., the three *tahsils* in Sirsa district in the extreme west sharing the inter-state border with Rajasthan and Punjab; four *tahsils* of Karnal district; three *tahsils* in Sonipat along with one *tahsil*, Sampla of Rohtak district and three *tahsils* of Gurgaon district along with Rewari *tahsil* of Rewari district. In most cases these *tahsils* encircle the *tahsils* named after the district of their location and having very low index values e.g., Karnal, Sonipat, Rohtak, Gurgaon and Sirsa. There are 17 *tahsils* with an index value of less than 0.20 termed as areas of very low male-female differential in literacy (Fig.3). Out of these, ten *tahsils*, three each in Ambala and Kurukshetra and two each in Panchkula and Yamunanagar districts form a large contiguous area in the extreme north of the state. The others occur as isolated patches in the districts of their location generally in the *tahsils* housing the district headquarters.

In areas of very high and high male-female differential index in literacy the main associations are with a low level of urbanization, primarily traditional agricultural economy, high concentration of socio-economically backward sections of the society, inadequate educational infrastructure. The low male-female differential in

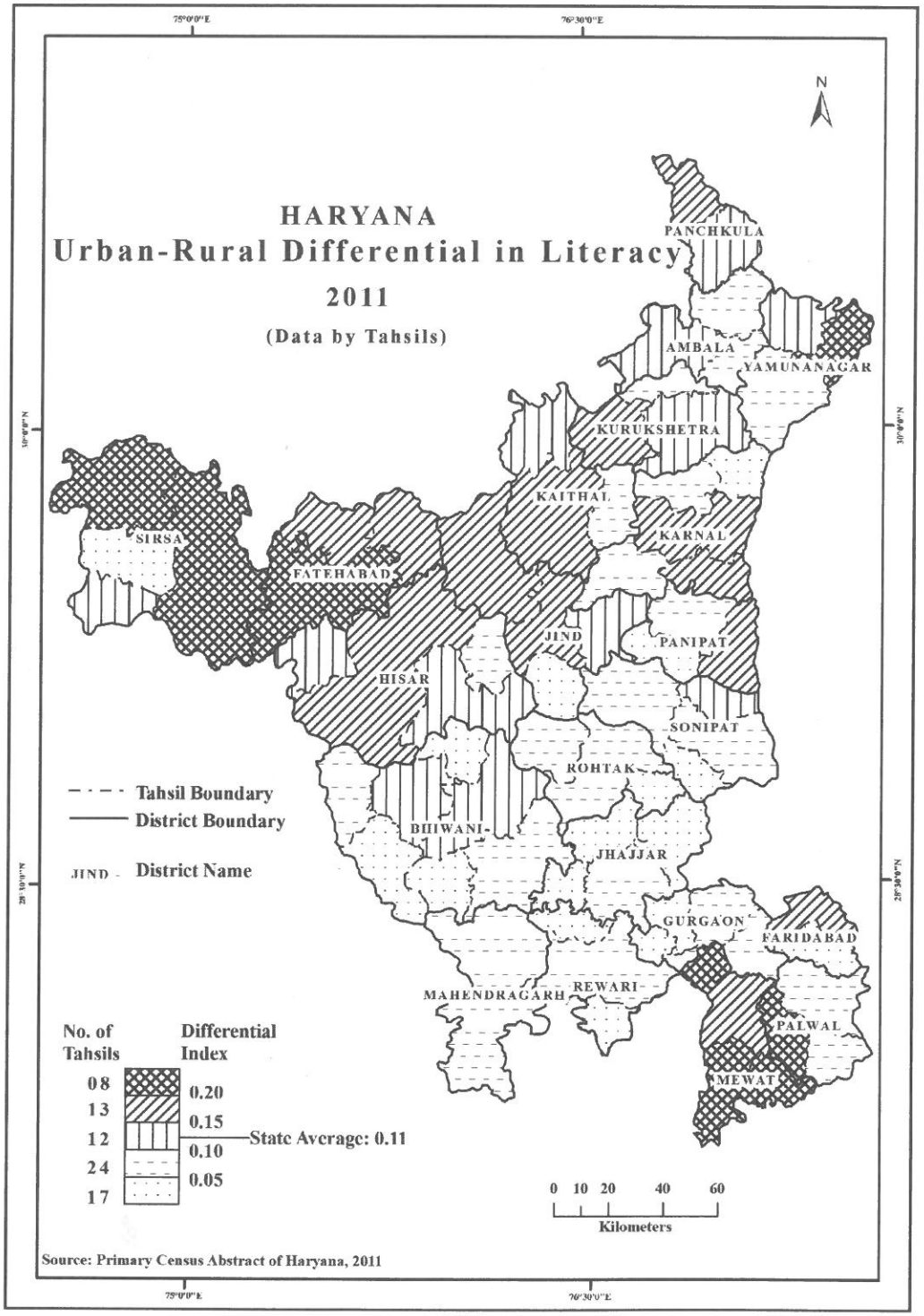
HARYANA
Urban-Rural Differential in Literacy
2011
(Data by Tahsils)
N
PANCHKULA
AMBALA
YAMUNANAGAR
KURUKSHETRA
KAITHAL
KARNAL
SIRSA
FATEHABAD
JIND
PANIPAT
HISAR
SONIPAT
ROHTAK
BHIWANI
JHAJJAR
GURGAON
FARIDABAD
MAHENDRAGARH
REWARI
PALWAL
MEWAT
Tahsil Boundary
District Boundary
JIND - District Name
No. of Tahsils
Differential Index
08 0.20
13 0.15
12 0.10
24 0.05
17
State Average: 0.11
0 10 20 40 60
Kilometers
Source: Primary Census Abstract of Haryana, 2011

Fig. 4

literacy in the northern part of the state and adjoining areas of Delhi is associated with faster increase in literacy. The inequality in literacy by sex is the outcome of traditional prejudices against female education because it is considered as having little economic value since there are strong prejudices against their employment. Female children suffer relative neglect and same is the case with their education. They are also not permitted much mobility and may not be sent to a school even in an adjoining village.

Urban-Rural Differential in Literacy

At the state level the urban-rural differential index value in literacy is 0.11 (Table 5). Like the male-female differential, the urban-rural differential also varies from one part of the state to another from 0.37 in Punahana in Mewat district to 0.01 in Kosli *tahsil* in district Rewari. On the basis of variations in index values the *tahsils* in the state can be grouped in to five categories (Fig.4). However, for the purpose of discussion the *tahsils* with higher values (above 0.15) have been categorised as (a) areas of high urban-rural differential with two sub-categories (i) areas of very high differential (8 *tahsils* with index value above 0.20) and (ii) areas of high differential (17 *tahsils* with index value from 0.15 to 0.20). The 12 *tahsils* with index value between 0.10 to 0.15 have been termed as (b) areas of moderate differential. The *tahsils* with an index value of less than 0.10 have been considered together as (c) areas of low differential with two sub-groups (i) areas of low differential formed by 24 *tahsils* with a value between 0.10 and 0.05 and (ii) areas of very low differential comprised of 17 *tahsils* with a value of less than 0.05. Three *tahsils* in the state *viz.*, Israna, Badhra and Matenhail in Panipat, Bhiwani and Jhajjar districts respectively are entirely rural.

Broadly, the spatial distribution of urban-rural differential values in literacy show a general pattern in which there is a decline in differential values from extreme western part of the state to the east. In fact the *tahsils* located to the west of the centre in the state have high differential values and those located east of the centre have predominantly low values (Fig. 4). Specifically, the areas of very high differential values comprise of two *tahsils* in Sirsa and one in Fatehabad forming a contiguous patch in the extreme west of the state; three *tahsils* in Mewat and one in adjoining Palwal district form another contiguous patch in the extreme south-east of the state while one *tahsil* in Yamunanagar occurs as an isolated patch in the north of the state. Seven *tahsils*, two each in Fatehabad and Jind, and one *tahsil* each in Hisar, Kaithal and Kurukshetra districts comprise a large area of high differential values adjoining the area of very high values in the west of the state. Another such area is formed by contiguously located two *tahsils* in Karnal and one *tahsil* in Panipat district in the east of the state. Other three *tahsils* in this group occur as isolated patches. The 12 *tahsils* with moderate differential values occur as scattered patches generally forming a zone of transition between areas of high and low differential values (Fig.4). In most cases these are adjoined towards the east by *tahsils* with low and very low index values. Out of the 24 tahsils having low index values (0.10 to 0.05) twelve form a large contiguous patch cutting across the districts of Gurgaon (three *tahsils*), Palwal, Mahendragarh, Rohtak, and Sonipat (two *tahsils* each) and Bhiwani (one *tahsil*) in southern and central Haryana. Another contiguous area, located to its north, formed by four *tahsils*, two in Karnal district and one each in Panipat and Kaithal districts can be identified. Two *tahsils* in Ambala and one each in Kurukshetra and Yamunanagar districts from another contiguous patch in the north of the state. Most of the *tahsils* with very low urban-rural differentials (less than 0.05) occur as isolated patches except for a contiguous area located adjacent to the national capital, New Delhi. There are only three *tahsils viz.*, Israna in Panipat district, Badhra in Bhiwani district and Matenhail in Jhajjar district which are entirely rural. The spatial variations in urban-rural differential index values in the state suggest that the cities and towns as an apex march towards modernization. Broadly, *tahsils* with high literacy rate in both urban as well as rural areas have low differential index. The

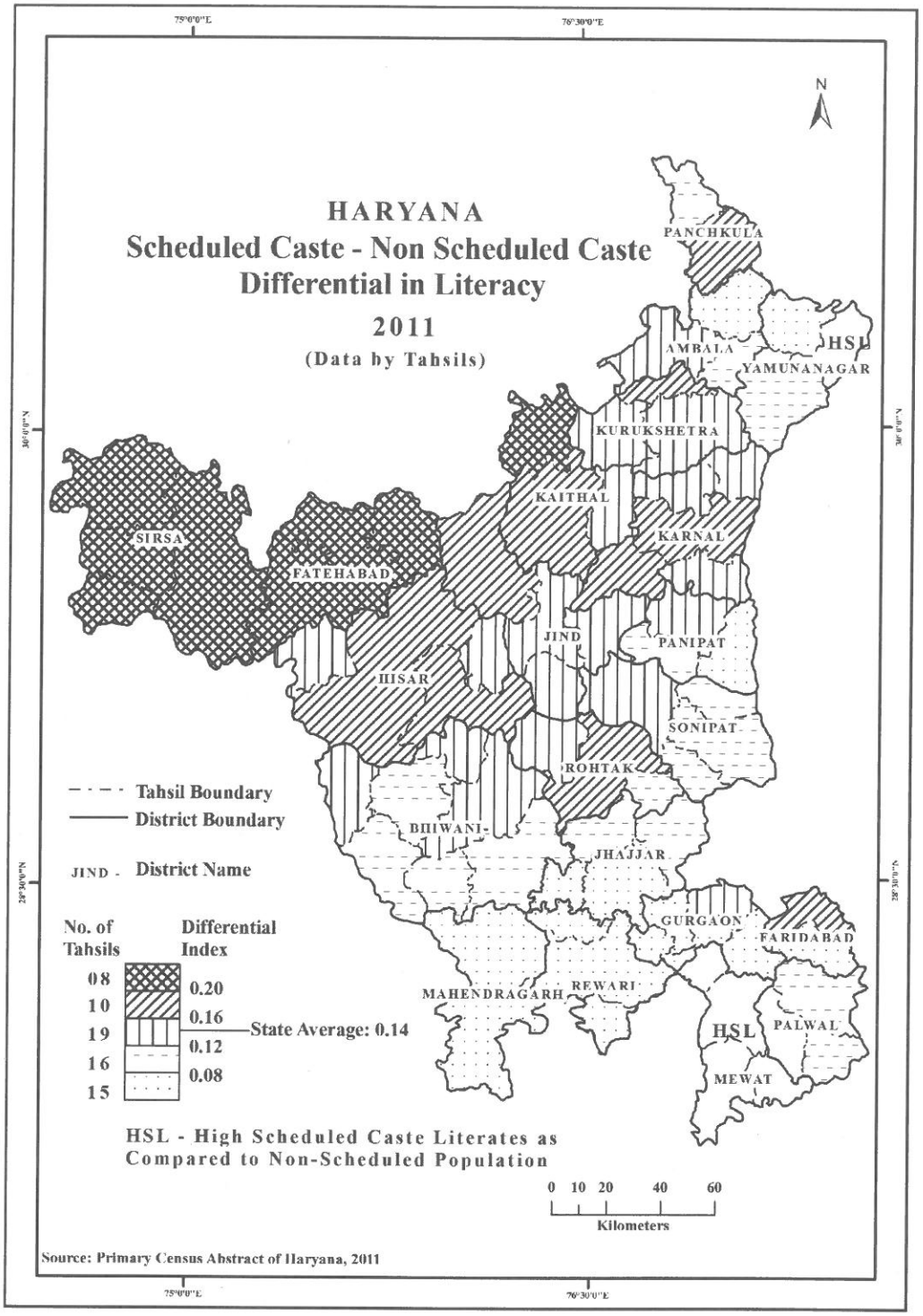
HARYANA
Scheduled Caste - Non Scheduled Caste
Differential in Literacy
2011
(Data by Tahsils)
N
PANCHKULA
AMBALA
HSL
YAMUNANAGAR
KURUKSHETRA
KAITHAL
KARNAL
SIRSA
FATEHABAD
JIND
PANIPAT
HISAR
SONIPAT
ROHTAK
BHIWANI
JHAJJAR
GURGAON
FARIDABAD
MAHENDRAGARH
REWARI
HSL
PALWAL
MEWAT
Tahsil Boundary
District Boundary
JIND - District Name
No. of Tahsils
Differential Index
08 0.20
10 0.16
19 State Average: 0.14
16 0.12
15 0.08
HSL - High Scheduled Caste Literates as Compared to Non-Scheduled Population
0 10 20 40 60
Kilometers
Source: Primary Census Abstract of Haryana, 2011
75°0'0"E
76°30'0"E

Fig. 5

western region of the state has the highest urban-rural differential index. By comparison, the adjoining areas of Delhi have the lowest urban-rural differential index (Fig. 4). The differences in the level of urbanization, socio-economic development, primarily traditional agricultural economy, high concentration of socio-economically backward sections of society, inadequate educational infrastructure and late start of education in rural areas are the chief determinants for the urban-rural differential in literacy.

Scheduled Caste-Non Scheduled Caste Differential in Literacy

Table 5 and Figure 5 depict the differential index values in literacy between scheduled caste and non-scheduled caste population in Haryana. The average index value for these two groups was 0.14 points in the state. The value varies between 0.34 in Ratia *tahsil* in Fatehabad to 0.05 in Sohana in Gurgaon district. On the basis of variations in the index value the *tahsils* in the state have been grouped in to five categories (Fig.5). The 18 *tahsils* with a value of above 0.16 have been termed as (a) areas of high differential. Out of these, 8 *tahsils* have very high value of above 0.20 and the remaining ten *tahsils* have high values (between 0.16 to 0.20). The 19 *tahsils* having values between 0.12 to 0.16 have been termed as (b) areas of moderate differential. There are 31 *tahsils* with an index value of less than 0.12. These are termed as (c) areas of low differential. Out of these 31 *tahsils* the value for 16 varies between 0.12 and 0.08. These are termed as areas of low differential. An additional 15 *tahsils* have a value of less than 0.08 and these are termed as areas of very low differential. Interestingly there are six *tahsils* in which the proportion of literates among the scheduled caste population is higher as compared to the non-scheduled castes. Among these four *tahsils* in Mewat and one in Palwal district form a contiguous patch in the extreme south of Haryana and Chhachhrauli *tahsil* in Yamunanagar district occurs as an isolated patch (Fig.5).

Spatially, a distinct pattern in which there is a decrease in the index value from very high in the extreme west of the state to low and very low in the extreme south-east and north-east can be identified. In fact the location of areas of very high to very low differential values reveal a pattern of transition. The eight *tahsils* with values above 0.20, four in Sirsa, three in Fatehabad and one in Kaithal districts form the area of very high differential in the western and northern part of the state adjoining the inter-state border with Rajasthan and Punjab. To its east is a large area of high differential formed by six out of 10 *tahsils*, two each in Hisar and Karnal and one each in Kaithal and Jind districts. The other four *tahsils* occur as isolated patches. The *tahsils* with moderate values between 0.12 and 0.16 form a large contiguous area located to the east of areas of high differential values stretching across *tahsils* located in Bhiwani, Rohtak, Kaithal, Jind, Karnal and Panipat districts. Out of the 19 *tahsils* in this category ten comprise this area. Low differential index values (0.08 to 0.12) are found in 16 *tahsils*. Spatially, eleven out of these, four in Bhiwani, two in Jhajjar, one in Rohtak, three in Sonipat and one in Panipat district form a contiguous patch in the form of a crescent located to the east of *tahsils* with high or moderate values (Fig. 5). Very low differential index values of less than 0.08 are found in 15 *tahsils* out of which twelve, two in Mahendragarh, three in Rewari, two in Jhajjar, four in Gurgaon, and one in Faridabad district form a spatially contiguous area in the south-east of the state. Two *tahsils*, one each in Ambala and Yamunanagar districts form a contiguous patch in the north and, one *tahsil* in Panipat district occurs as an isolated patch. As one moves from western Haryana to southern Haryana the differential in literacy decreases because of the proximity of Delhi. High value of differential index in literacy in *tahsils* of western part are associated with several factors such as the traditional engagement in occupations like agricultural labour, household industries and menial services by the people of lower caste. In comparison the *tahsils* which adjoin the Union Territory of Delhi are

characterized by relatively high literacy rate and low differential index in literacy. The main association behind this is that the proximity of Delhi has diversified the economy of these *tahsils* and created a greater awareness towards education leading to the spread of education not only among the general population but also among the scheduled castes e.g. the scheduled caste population in Mahendragarh, Narnaul, Rewari and Bawal *tahsils* recorded relatively high literacy rates along with the general population in these *tahsils* which are predominantly inhabited by Ahirs who have established a fine tradition in army service by virtue of which they hold progressive outlook, particularly in relation to giving education to their children (Chandna, 1972). It further led to the opening of many educational institutions which benefitted the scheduled caste population also by making them relatively more literate.

Correlation Analysis

There are considerable variations in the level of literacy in Haryana. Therefore, an attempt has been made to analyze quantitatively the levels of literacy and its determinants by employing the correlation coefficient technique. The association between overall literacy rate and each of the independent variables has been computed and tested to know the existing relationship between variables. Table 6 shows the correlation coefficient between dependent and independent variables on the basis of *tahsil* level data from 2011 Census. The list of dependent and independent variables is given below:

Dependent Variable

Y = Percentage of Literates to Total Population

Independent Variables

X1 Urban Population (Per cent of Total Population)

X2 Non-Agricultural Workers (Per cent of Total Population)

X3 Number of Schools (Government and Private)

N = 74

Urbanization

The level of urbanization plays a very important role and has a great impact in the spread of literacy in an area because socio-economic status of urban centers requires more educated persons as compared to rural areas, educational facilities in towns and cities are much more than villages, females do avail superior status in urban societies than in rural and, educated persons usually migrate to urban centers in search of jobs. Therefore, here it has been chosen as an independent variable.

Non-Agricultural Workers

Non-agricultural activities undertaken by workers either as main or subsidiary occupations have a direct effect on literacy in an area. A higher proportion of non-agricultural workers in an area is expected to have a better level of literacy since the

Table-6: Haryana: Coefficient of Correlation of Literacy Rate with Selected Variables, 2011

	Y	X_1	X_2	X_3
Y	1.000			
X_1	.479(*)	1.000		
X_2	.653(*)	.830(*)	1.000	
X_3	.264	.400(*)	.358(*)	1.000

Source: Computed from Primary Census Abstract of Haryana, 2011
** Correlation is significant at the 0.01 level (1-tailed).*

category of non-agricultural workers includes those jobs which require a particular skill or some level of educational attainment to perform these jobs.

It is evident from Table 6 that literacy level (Y) is positively associated with urban population (X1) and non-agricultural workers (X2). The proportion of non-agricultural workers has the highest positive correlation coefficient (0.653) with literacy level followed by urban population (0.479) and number of schools (0.264). This is significant at one per cent level (one-tailed) with non-agricultural works and urban population. At this significant level the critical area of a distribution is one sided. The one-tailed test gets its name from testing the area under one of the tails (sides) of a normal distribution, although the test can be used in other non-normal distributions as well. The relationship between urbanization (X1) and non-agricultural activity (X2) was almost perfectly positive (0.830). The total number of schools (X3) positively and significantly co-varies with urbanization (X1) and non-agricultural activity (X2). A closer scrutiny suggests that the literacy level of the state is positively correlated with independent variables. The explanation leads to the conclusion that urbanization and non-agricultural workers in an area are the chief determinants but the magnitude of their effect is different.

Conclusions

This paper has made an effort to analyze the areal variations in the distribution and differentials in the levels of literacy in Haryana in terms of male-female, rural-urban and Scheduled Caste and non-Scheduled Caste population. Haryana is a densely populated (573 persons per sq. km) state of India where majority of the people are engaged in agricultural activities (51.8 per cent). Generally high level of urbanization and high degree of industrialization are associated with a high level of literacy in an area. There are two concentrations of areas where literacy rate is more than 78.00 per cent. One concentration comprises *tahsils* located adjacent to the National Capital Region and the other concentration is found around the state capital, Chandigarh. The causes of high percentage of literacy in these areas need an explanation. The first area comprising the NCR has a number of large towns. These towns abound in government offices and educational institutions. Similarly, the area around the state capital also has a large urban agglomeration with industrial, commercial and a number of educational institutions. There are marked regional variations in literacy depending upon the level of urbanization and the development of industrial, commercial, agricultural, irrigation and transport facilities. Usually, literacy is high in the plains and south-eastern region of the state. It is low in hilly areas of Aravalli of Mewat district and in the forested hilly area of the Yamunanagar district. Western Haryana shows comparatively low literacy than the educationally developed area in the northern region. In Haryana, high male-female differential in literacy in urban areas is a result of larger male selective immigration from the rural areas to the cities and towns in search of employment. Urban centers also attract a large number of male students from the countryside. This has increased the male literacy in urban areas on the one hand and widened the gulf between male and female literacy on the other. This unusual disparity among male and female is also related to a long and continued prejudice against women's employment outside the home. A high differential index has been observed between rural and urban population in the western and southern part of the state caused by low literacy in rural areas related to several factors such as higher socio-economic status of urban centers requires more educated persons than villages, educational facilities in towns and cities are much more and better than villages, females do avail superior status in urban societies than in rural and, educated persons usually migrate to urban centers in search of jobs. However, during recent years, with the opening of a large number of schools in rural areas and increasing socio-economic and political awakening there has been a remarkable progress in literacy in the rural areas of

the state. It may be seen that the level of urbanization plays a very important role in the spread of literacy. The prosperity of a region attracts a large number of in-migration of literate and educated persons from the neighbouring areas. Majority of the towns function as centers of administration, education and trade and commerce. Therefore, rate and pattern of urbanization has a greater impact on literacy in Haryana.

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POPULATION GEOGRAPHY Volume 36 Number 1 & 2 June-December 2014

NEW MAP SERIES : 4
SLUM POPULATION IN METROPOLITAN CITIES OF INDIA: 2011

GOPAL KRISHAN
Chandigarh, India

A favourite quote of Professor Gurdev Singh Gosal :
"The geography of soul is the soul of Geography."

Introduction

The Section-3 of the Slum Area Improvement and Clearance Act, 1956, defines slums in India as mainly those residential areas where dwellings are in any respect unfit for human habitation by reasons of dilapidation, overcrowding, faulty design of buildings, narrowness and defective arrangement of streets, lack of ventilation, light or sanitation facilities or any combination of these factors which are detrimental to safety, health and morals. Conceptually slums are, thus, compact overcrowded residential areas, and not isolated or scattered dwellings, unfit for habitation. These are the troubled spots of the soul of cities.

Census of India 2011 provides fairly elaborate data on slum population in all statutory towns/cities, irrespective of their population size. Three types of slums are distinguished: Notified, Recognized and Identified. Notified slums are synonymous with localities notified as slums in a town/city by State, Union Territory Administration or Local Government under any Act. Recognized slums are those which have been viewed on similar lines but have not been formally notified under any Act. Identified slums are the ones which have been identified by the Census Charge officer and also inspected by the nominee of the Census Directorate. These represent compact areas of at least 300 population or about 60-70 households of poorly built congested tenements in unhygienic environment usually with inadequate infrastructure and lacking in proper sanitary and drinking water facilities.

Among the 4041 statutory towns in the country, 2613 reported existence of slums, as per the 2011 Census. The slum population in these places was recorded as 65.5 million or 22.5 percent of their population. This population was somewhat equally shared by these three types of slums: 34.4 percent notified; 30.7 percent recognized; and 34.9 percent identified.

The share of slum population living in these three types of slums, however, differs significantly by states and union territories (Table 1). Most earnest in notifying slums have been Sikkim, Himachal Pradesh, Kerala, Andhra Pradesh, Karnataka, Meghalaya and Punjab, where a majority of slum population dwells therein. In Chandigarh Union Territory every slum pocket is notified. In Mizoram, Tripura, Uttar Pradesh, Nagaland, West Bengal and Odisha, as also in the Union Territory of Puducherry, a majority of slum population resides in recognized ones. Slums exist but only with identified status in Bihar, Rajasthan, Gujarat and Arunachal Pradesh. The National

Table - 1: India: Distribution of Slum Population by Type of Slum (2011)

India/States/Union Territories*	Percentage of slum population in		
	Notified	Recognized	Identified
States			
All India	**34.4**	**30.7**	**34.9**
Sikkim**	100.0	0.0	0.0
Himachal Pradesh	98.2	0.0	1.8
Kerala	92.4	4.1	3.5
Andhra Pradesh (including Telangana state)	81.9	8.6	9.5
Karnataka	69.0	13.5	17.4
Meghalaya	60.5	13.9	25.6
Punjab	53.9	13.3	32.8
Tamil Nadu	43.8	34.1	22.1
Uttarakhand	38.1	10.7	51.2
Chhattisgarh	37.6	40.3	22.1
Madhya Pradesh	33.4	44.5	22.1
Maharashtra	31.3	29.4	39.3
Jammu and Kashmir	24.6	20.6	54.8
Goa	23.3	0.0	76.7
Jharkhand	17.3	15.9	66.8
Uttar Pradesh	9.0	75.0	16.0
Assam	4.6	36.0	59.4
Haryana	0.9	0.0	99.1
West Bengal	0.8	57.7	41.5
Mizoram**	0.0	100.0	0.0
Tripura	0.0	88.7	11.3
Nagaland	0.0	58.6	41.4
Odisha	0.0	52.1	47.9
Bihar**	0.0	0.0	100.0
Rajasthan**	0.0	0.0	100.0
Gujarat**	0.0	0.0	100.0
Arunachal Pradesh**	0.0	0.0	100.0
Manipur	0.0	0.0	0.0
Union Territories			
Chandigarh**	100.0	0.0	0.0
Puducherry	48.5	51.1	0.4
Delhi	41.4	0.0	58.6
Andaman & Nicobar	0.0	0.0	100.0
Dadra Nagar Haveli	0.0	0.0	0.0
Daman & Diu	0.0	0.0	0.0
Lakshadweep	0.0	0.0	0.0

Source: Census of India, 2011: Primary Census Abstract, Slum, p. LXX.

** Listed in descending order of the percentage of slum population in notified, recognized and identified slums.*

***** All slums in Sikkim and Chandigarh are notified; all in Mizoram recognized; and all in Bihar, Rajasthan, Gujarat and Arunachal Pradesh simply notified.***

Table - 2: India: Percentage of Slum Population by Size Category of Towns/ Cities (2011)

Size category	Slum population	Percentage of slum population	Percent share in total slum population
One Million and above	2,599,576	21.5	38.3
100,000 to one million	22,371,095	21.4	34.2
20,000 to 100,000*	15,342,770	24.3	23.4
Less than 20,000*	2,681,163	27.2	4.1
Total	65,494,604	22.4	100.0

Source: Census of India, Primary Census Abstract, Slum, p. LXVIII.
**** Contrary to popular notion smaller towns and cities have a higher percentage of slum population than the larger ones.***

Capital Territory of Delhi also recorded a majority of its slum population residing in identified ones.

A popular perception that the larger towns/ cities are marked by higher incidence of slum population than the smaller ones is not validated by data (Table 2). The share of slum population in their respective category was the highest at 27.2 percent in the case of small towns with a population of less than 20,000; 24.3 percent in respect of medium towns with a population of 20,000 to one hundred thousand; and 21.4 percent in cities with a population of at least one hundred thousand. The cities, even the metropolitan ones with a population of one million or above, had recorded virtually the same percentage of slum population as the non-metropolitan ones did. By and large, migration to large cities and obsolescence of existing localities in smaller towns has been largely generative of slums in the two different situations.

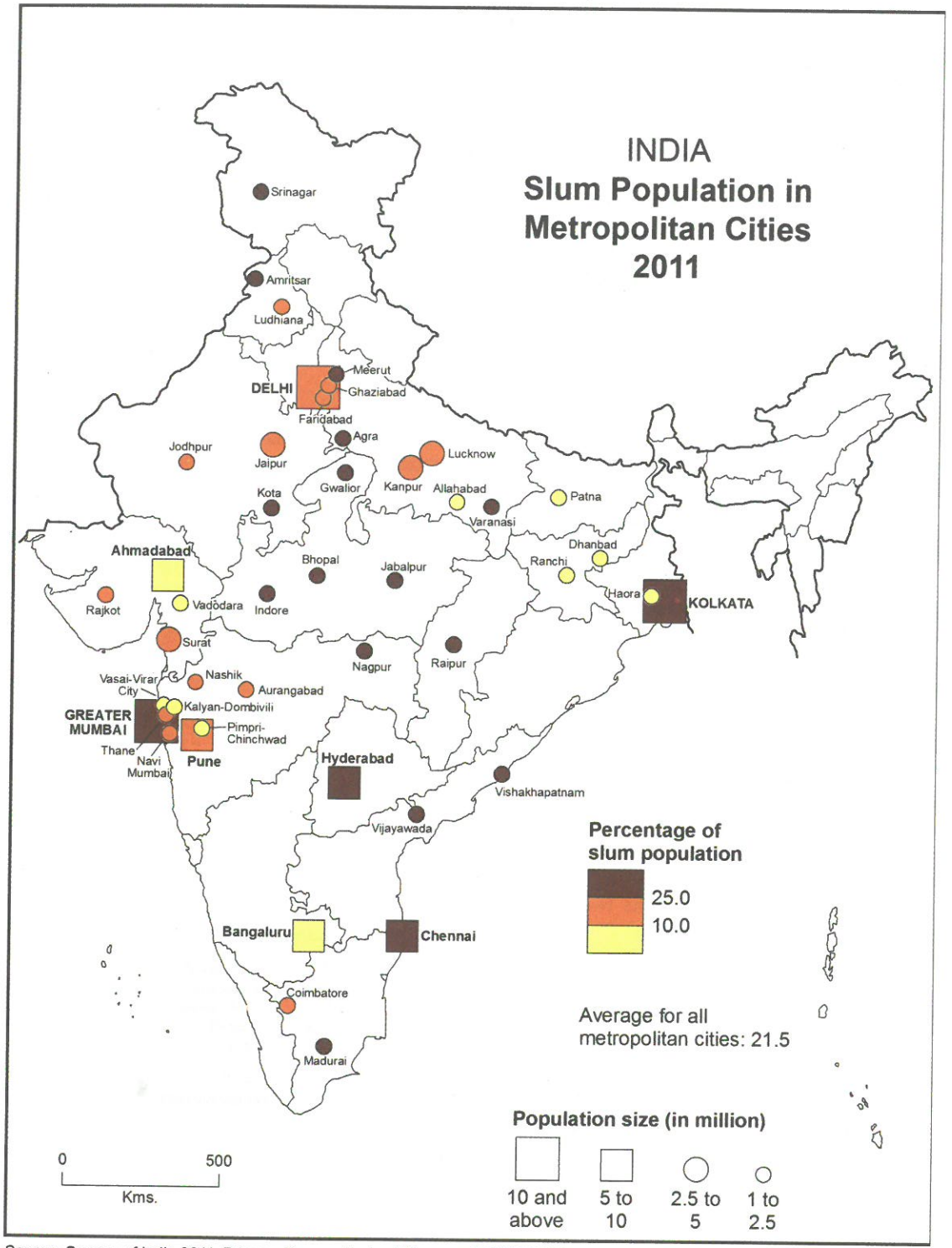
This should not lead one to believe that the size of slum population in cities is in any way small. Census 2011 data reveals that out of the total slum population in India, 72.5 percent dwells in cities, 23.4 percent in medium towns and 4.1 percent in small towns. The top 93 cities alone account for 50.7 percent of slum population in urban India, and among them 46 metropolitan cities partake over two-thirds of this slum population.

The 46 metropolitan cities together recorded 21.5 per cent of their population as resident of slum localities (Table 2). Nineteen among them had more than one-fourth of their population as slum dwellers while 11 had less than one-tenth of the total. In the remaining 16 metropolitan cities, the percentage of slum population ranged between 10 and 25 percent (Table 3).

Jabalpur (44.7 percent), Vishakhapatnam (44.6 percent), and Greater Mumbai (41.8 percent) are the three first ranking metropolitan cities in terms of share of slum population in the total. On the other hand, Dhanbad (1.2 percent), Vasai-Virar City (2.9 percent) and Ahmadabad (4.4 percent) can be credited for recording the lowest percentage of slum population. No consistent relationship is observed between the population size and share of slum population in metropolitan cities of India as per the Census 2011.

The factor of 'location', of course, projects itself as significant. Metropolitan cities in backward regions are noted for a relatively high incidence of slum population. This is observed particularly in central India. On the other hand, metropolitan cities in proximity of big metros such as Haora adjacent to Kolkata, Kalyan-Dombivli close to Greater Mumbai, and Pimpri-Chinchwad near Pune are noted for low concentration of slum population.

Among 14 metropolitan cities which have the status of state/national capital, seven are



Source: Census of India 2011, Primary Census Abstract Slum pp. XCVII-XCVIII

Table - 3: India: Ranking of Metropolitan Cities by Slum Population (2011)

Metropolitan city*	State /Union Territory	Population	Slum population	Percentage of slum population
Jabalpur	Madhya Pradesh	1,081,677	483,626	44.7
Visakhapatnam	Andhra Pradesh	1,728,128	770,971	44.6
Greater Mumbai	Maharashtra	12,442,373	5,206,473	41.8
Meerut	Uttar Pradesh	1,305,429	544,859	41.7
Raipur	Chhattisgarh	1,027,264	406,571	39.6
Vijayawada	Andhra Pradesh	1,143,232	451,231	39.5
Nagpur	Maharashtra	2,405,665	859,427	35.7
Agra	Uttar Pradesh	1,585,704	533,554	33.6
Hyderabad	Andhra Pradesh	6,993,262	2,287,014	32.7
Kota	Rajasthan	101,694	319,309	31.9
Kolkata	West Bengal	4,496,694	1,409,721	31.4
Indore	Madhya Pradesh	1,994,397	590,257	29.6
Gwalior	Madhya Pradesh	1,054,420	309,793	29.4
Chennai	Tamil Nadu	4,646,732	1,342,337	28.9
Srinagar	Jammu & Kashmir	1,206,419	343,125	28.4
Amritsar	Punjab	1,159,227	329,797	28.4
Madurai	Tamil Nadu	1,017,865	278,153	27.3
Bhopal	Madhya Pradesh	1,798,218	479,699	26.7
Varanasi	Uttar Pradesh	1,198,491	302,025	25.2
Jodhpur	Rajasthan	1,056,191	254,096	24.1
Pune	Maharashtra	3,124,458	690,545	22.1
Ghaziabad	Uttar Pradesh	1,648,643	333,962	20.3
Aurangabad	Maharashtra	175,116	221,001	18.8
Navi Mumbai	Maharashtra	1,120,547	207,645	18.5
Thane	Maharashtra	1,841,488	326,798	17.7
Kanpur	Uttar Pradesh	2,768,057	425,008	15.4
Faridabad	Haryana	1,414,050	215,053	15.2
Ludhiana	Punjab	16,188,179	244,163	15.1
DMC	Delhi	11,034,555	1,617,239	14.7
Rajkot	Gujarat	1,323,363	189,360	14.3
Lucknow	Uttar Pradesh	2,817,105	364,941	13.0
Nashik	Maharashtra	1,486,053	189,721	12.8
Coimbtore	Tamil nadu	1,050,721	129,181	12.3
Jaipur	Rajasthan	3,046,163	323,400	10.6
Surat	Maharashtra	4,501,610	467,434	10.4
Bangalore	Karnataka	8,495,492	712,801	8.4
Kalyan-Dombivili	Maharashtra	1,247,327	98,157	7.9
Allahabad	Uttar Pradesh	1,168,385	91,689	7.8
Haora	West Bengal	1,077,075	83,509	7.8
Pimpri Chincwad	Maharashtra	1,027,692	129,099	7.5
Ranchi	Jharkhand	1,073,427	74,287	6.9
Vadodra	Gujarat	1,752,371	84,804	4.8
Patna	Bihar	1,684,297	77,034	4.6
Ahmadabad	Gujarat	5,633,927	250,681	4.4
Vasai-Virar City	Maharashtra	1,222,390	35,691	2.9
Dhanbad	Jharkhand	1,162,472	14,275	1.2

Source: Census of India, 2011: Primary Census Abstract Slum, pp. XCVII-XCVIII.

** Metropolitan City is the one with a population of at least one million.*

** All the metropolitan cities in the table are identified through their official status as Municipal Corporation rather than as Urban Agglomeration.*

** The metropolitan cities have been listed as per descending order of their percentage of slum population.*

**** The share of slum population in total population of metropolitan cities finds an association more with their location and function rather than with population size.***

marked by more than one-fourth of their population living in slums. Prominent regional centers such as Nagpur, Vijayawada and Meerut fall on similar lines. Industrial cities such as Vishakhapatnam, Raipur and Kota, are also high on incidence of slum population. The role of the 'function' of a metropolitan city comes into prominence in all such cases.

Evidently the factors of location and function have been more critical than the factor of population size in influencing the incidence of slum population in metropolitan cities. Inclination of the government to notify/recognize slums also seems to be a significant factor. The extremely low figure of Dhanbad prompts such a consideration.

A word of caution here will be in order. The data on slum population needs to be analyzed with some care. Different states/union territories have shown varying tendency in notifying or recognizing slums. While in Kerala, Himachal Pradesh and Sikkim almost the entire slum population resides in notified slums; in Bihar, Rajasthan and Gujarat, slum population is reported as residents of identified slums only. Likewise, while in Chandigarh all slums are notified; in Andaman & Nicobar Islands all of these are identified. The percentage of slum population is likely to be understated if the slums have not been notified or recognized by the government.