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Regional analysis of urban-rural differentials in literacy in Uttar Pradesh, India

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The present paper is an attempt to analyse the trends of differential in literacy rate, spatial patterns of urban-rural differential and the relationship between differential index and selected variables of development among the districts of Uttar Pradesh, India. The urban-rural differential index is found to be high in the south-eastern part and it tends to decline towards western part of the state. The relationship between rural literacy and urban literacy rate are marked by a substantial increase from western-central to eastern regions. The 't' test reveals that male literacy rate, female literacy rate, urbanization, per capita income, commercialization, educational facilities, and medical facilities are the chief determinants.

Key words: Rural population, differential index, relationship, variables, literacy rate, urbanization.

INTRODUCTION

Literacy is one of the biggest and the most difficult issues that people in the developing countries are facing. The developing countries of the world, of which India is a part, are characterized not only by low literacy rates but also by a great disparity in the literacy rates between urban and rural, between males and females and between young and the aged, a disparity in consonance with differences in necessity, prosperity, and opportunity to become literate. Equally striking are the regional disparities in literacy and literacy differentials itself.

Literacy is one of the important demographic elements, which is good measure of human process towards modernization. It is an important indicator of the socio-economic development of an area. It acts as a catalyst for social upliftment enhancing the returns on investments made in almost every aspects of development efforts, be it population control, health, hygiene, environmental degradation control, empowerment of women and weaker sections of the society. 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 democratic processes and hamper social advancement, economic growth and political maturity. Above all, literacy influences other attributes of population such as fertility, mortality, sex-ratio and occupation etc. As per the definition of the Census of India 2001, a person who can read and write with understanding in any language is taken as literate. All children below the age of 7 years have been treated as illiterate. In the 1961, 1971 and 1981 Censuses, children below the age of 5 years were considered as illiterates (Census of India, 2001).

Urban-rural differences are essentially a function of the differential rates of change occurring in towns and villages. Literacy, like other innovations, originates in urban places and diffuses subsequently into the countryside: The process of literacy begins in the town and trickles down to the village. The pace of the process depends on the intensity of interaction between the two. The degree of urban influence and the intensity of urban-rural interaction are evidently two major factors involved in the reduction of disparities between urban and rural literacy rates. Urban influence may also pay an indirect role by stimulating diversification of the rural economy. A diversified economic base in village generally accelerates the progress of rural literacy (Krishan and Shyam, 1978).

This problem has attracted attention of many scholars from different sciences resulting in a voluminous and diverse literature from various perspectives. Some of the important contributions are by Zachariah (1962), Krishan and Chandna (1974), Gurumurthy (1976), Siddique (1977), Gosal (1979), Mishra (1980), Mamoria (1981), Usha Rao (1981), Ram (1981), Mathur (1982), D'Souza (1982), Nain (1988), Ahmad and Nuna (1986), Sagar, (1990), Krishan (1991), Premi (1991), Jolly (1991), Ali (1995), Siddiqui and Naseer (2004) and others. But

perhaps there is no particular study on urban-rural differentials in literacy at district level.

Keeping these observations in view, in the present study, an attempt has been made to study the 'Regional Analysis of Urban-Rural Differentials in Literacy in Uttar Pradesh, India'. The objectives of this analysis are:

1. To examine the trends of urban-rural differentials in literacy in Uttar Pradesh and India from 1951 to 2001.
2. To describe the spatial distribution of differential in literacy in the districts of Uttar Pradesh.
3. To examine the relationship between rural and urban literacy rate, and
4. To analyse the relationship between literacy rate and levels of development and test the degree of relationship between differential index and independent variables in the state.

METHODOLOGY

Study area

The present study is related to the Uttar Pradesh which is the most populous state in India and occupies 7.3% area of the country. According to 2001 census, the population of Uttar Pradesh is 166 million (16.16% of the India's total population) of which 79.22% is rural and 20.78% is urban. The predominance of rural population makes the state economy primarily agrarian. The State's 66% of the work force, however, is still dependent on the agriculture and its allied activities for their livelihood. The economic development and prosperity of the masses depend mainly on agricultural base. It has witnessed rapid industrialization in the recent past particularly after the launch of policies of economic liberalization in the state.

After the hill districts were constituted into a separate State of Uttarakhand, Uttar Pradesh now largely consists of Gangetic Plain in the northern part of the country. The major river flowing through the State is the Ganga and its tributaries such as Yamuna, Ramganga, Gomti and Ghaghra. It lies between lat 23° 52' and 30° 24' N and long 77° 05' and 84° 38' E sharing international border with Nepal and Tibet in northeast, by the Indian states of Himachal Pradesh in northwest, by Haryana, Rajasthan and Delhi in west and by the state of Madhya Pradesh in south and the state of Bihar and Jharkahnd in southwest (Figure 1). Geographically, the location of Uttar Pradesh and its climate are suitable for the inhabitants to survive and live in comfort.

Data base

The study is mainly based on the secondary sources of data obtained from the Office of the Registrar General of India and Census Commissioner, Government of India, New Delhi and State Planning Institute, Uttar Pradesh, Lucknow. In the present paper, most suitable statistical and cartographic techniques have been applied. For the identification of the levels of development and its correlates, twenty-two variables have been selected (Table 2). The district has been considered as the smallest unit of study. The study is based on 2001 census data and urban-rural differential literacy rate is calculated by using the following formula (Krishna and Shyam, 1978).

$$ID = \frac{U - R}{T}$$

Where; ID = index of urban- rural differential in literacy; U = Percentage of literates in urban population; R = Percentage of literates in rural population, and T = Percentage of literates in total population.

$$\text{For Uttar Pradesh, this indices would be} = \frac{69.8 - 52.5}{56.3} = 0.31$$

The discussion in the present paper is based on the index values obtained for districts of Uttar Pradesh.

RUSULTS AND DISCUSION

Trends of urban-rural differential in literacy, 1951 to 2001

The analysis of literacy differential by residence has not been possible for the pre-Independence period because of the non-availability of census data for this period. Hence, the data on growth of literacy have been provided for the post-Independence period from 1951 to 2001. Table 1 reveals that the literacy rate improved from 10.8% in 1951 to 25.4% in 1971 and rose further to 56.3% in 2001. Similarly, the literacy rate for urban areas which was 29.0% in 1951 rose to 50.5% in 1971 and then increased further to 69.8% in 2001. In rural areas, the literacy rate which was only 8.0% in 1951 increased to 21.3% in 1971 and further improved to 52.5% in 2001 (Table 1 and Figure 2).

A considerable growth has taken place in literacy during 20th century, but it has not been satisfactory. It is however, well known that this progress is mainly concentrated in the urban areas, while the vast rural areas are far behind. An encroaching feature is that the growth rate of literacy in the decade ending 2001 has been higher in the rural areas. Despite these improvements, literacy in urban areas was 56.3% and that in rural areas, 52.5%. The most important reason behind the increase in literacy is the new definition and concept of literacy in the census of 1991 which excludes the population in the age-group of 0 to 6 years from the total population. In this way, the 1991 census uses the term 'Literacy Rate' in relation to the age-group of seven years and above (Census of India, 1991).

The urban-rural differential index in literacy rate in Uttar Pradesh decreased continuously from 1.94% point in 1951 to 0.31% point in 2001. India has also made remarkable differences in literacy since independence. It has decreased during the same period from 1.23% point in 1951 to 0.33% point in 2001. The urban-rural differential index of Uttar Pradesh has been decreasing continuously over the time since 1951, when it was

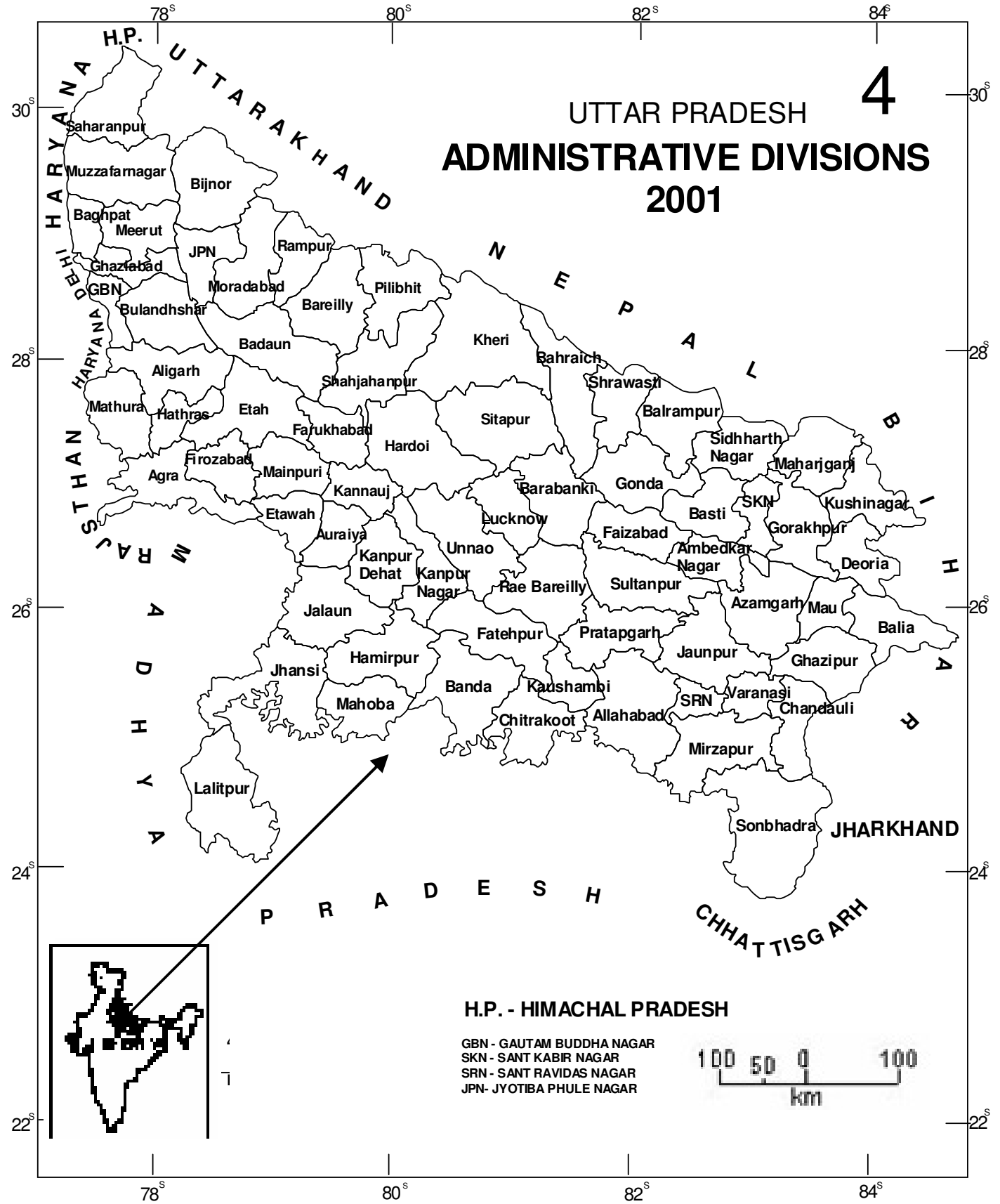

Figure 1. Utta Pradesh administrative divisions, 2001.

Table 1. Literacy rate and differential index, Uttar Pradesh, India, 1951 to 2001.

Census year	Uttar Pradesh					India			
	Age-group	Total areas	Urban areas	Rural areas	Urban-rural differential index	Total areas	Urban areas	Rural areas	Differential index
1951	5 and over	10.8	29.0	8.0	1.94	18.3	34.6	12.1	1.23
1961	5 and over	20.7	46.9	16.9	1.45	28.3	54.4	22.5	1.13
1971	5 and over	25.4	50.5	21.3	1.15	34.5	60.2	27.9	0.94
1981	7 and over	33.3	56.5	29.1	0.82	43.6	67.2	36.0	0.72
1991	7 and over	41.6	61.0	36.7	0.58	52.2	73.1	44.7	0.54
2001	7 and over	56.3	69.8	52.5	0.31	64.8	79.9	58.7	0.33

Source: Census of India, Registrar General of India, New Delhi.

Table 2. Coefficients of correlation for urban - rural differential in literacy and its correlates, Uttar Pradesh, 2001.

Correlate	Coefficient of correlation with urban - rural differential index (Y_1)
Percentage	
X_1 Literates in all areas	-0.731*
X_2 Literates in rural areas	-0.797*
X_3 Literates in urban areas	0.096
X_4 Literate male in all areas	-0.711*
X_5 Literate female in all areas	-0.704*
X_6 Urban population to total Population	-0.355*
X_7 Rural population to total population	0.338*
X_8 Scheduled caste population to the total population	0.051
X_9 Population below poverty line	-0.109
X_{10} Agricultural labourers to total workers	0.408*
X_{11} Marginal workers to total workers	0.284**
X_{12} Cultivators to total main workers	0.447*
X_{13} Agricultural labourers to total main workers	0.337*
X_{14} Household workers to total main workers	-0.281**
X_{15} Other than household workers to total main workers	-0.461*
Index	
X_{16} Electrified villages	0.070
X_{17} Population density	-0.284**
X_{18} Average size of landholding	-0.054
X_{19} Per capita income (at current price)	-0.320*
X_{20} No. of medical Hospitals	-.0154
X_{21} No. of bed in Hospitals	-0.009
X_{22} Villages in linked road	-0.429*

*Significant at 99% level of confidence; **Significant at 95 % level of confidence

sharper (1.94), as there was only the rural literacy rate for nearly every four (1:3.63). This disparity ratio declined from 3.63 in 1951 to 1.33 in 2001. The rural literacy had, nonetheless, registered as gradual increase from 8.0% in 1951 to 52.5% in 2001 and differential index narrowed down gradually from 1.94 in 1951 to 0.30 in 2001. From 1991 to 2001, the urban-rural differential literacy index fell sharply to 0.31 and 0.33% point in the state and country,

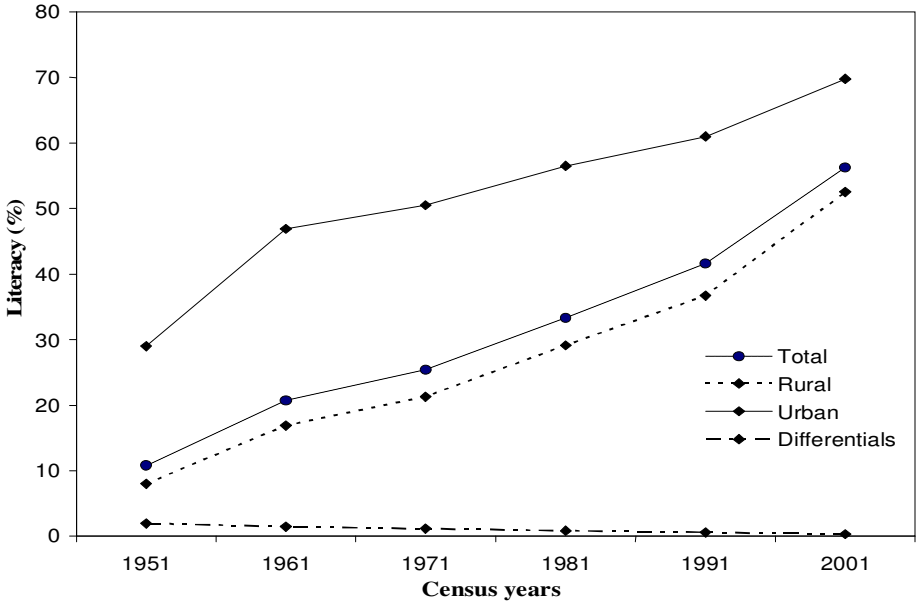

Figure 2. Literacy rate and urban-rural differentials, Uttar Pradesh, 1951 to 2001.

respectively. If progress is made at the same rate in the coming decades as well, then it would be possible to remove illiteracy by 2040 A.D.

The narrowing down of the urban-rural differential index as well as disparity ratio was associated with increasing degree of urban-rural interaction, increasing socio-economic functional value of education in the countryside, improving standards of living, and increasing facilities for schooling in the countryside. The 1991 to 2001 decade is the first census period when the absolute number of Uttar Pradesh illiterates declined (by 4.5 million), indicating that the literacy growth rate is now outstripping the population growth.

Urban-rural differential in literacy

The urban-rural differential in literacy is marked with notable variations in its distribution among the districts of the state. It varies from 0.94 in Bahraich to -0.15 in Azamgarh district with a state average of 0.31 in 2001 (Table 3). These variations may be conveniently grouped into five grades (Table 4). The graded distribution of urban-rural differential in literacy as given in Figure 3 shows that seven districts of the state fall under very high grade (0.60 and above) comprising the districts of Bahraich (0.94), Balrampur (0.89), Sonbhadra (0.85), Gonda (0.76), Sarwasti (0.72), Sidhrathnagar (0.62) and Lalitpur (0.62) in the north eastern and southern part of the state. These districts having very high differential index which is more than double of the state average (0.31). The reasons for these differentials are low level of urbanization, primarily traditional agricultural economy, high concentration of socio-economically backward sections of the society, inadequate educational infra-structure and late start of education in rural areas. Only five districts having high differential index of 0.45 to 0.60% forms two distinct regions in the eastern and western part of the state. The former which is relatively large in size comprises the districts of Maharajganj (0.55), Kushinagar (0.49) and Basti (0.48) and the later includes Badaun and Rampur districts (Figure 3). The urban-rural differential has been reducing continuously due to faster increase in rural literacy in the recent decade.

Twenty districts which are very close to the state urban-rural literacy differential average (0.31% point) ranging from 0.30 to 0.45% point are found to be grouped into a number of regions of which the most important region runs from Kheri district in the north to Mirzapur district in the south and covers about nineteen per cent of the area of the state. The rest of the districts belonging to this grade are scattered sporadically in the western and southern parts of the state. The urban-rural gap in terms of literacy is minimizing continuously due to educational facilities in rural mass and the rural population is more aware about the benefit of literacy. About fifty per cent districts fall under the grade of 0.15 to 0.30 urban-rural differential literacy indices. These districts are found to be grouped into a number of small regions of which the most prominent one extends from the Pilibhit in the north to Chitrakoot district in the south of the state. The second region though less prominent, lies in the eastern part and comprises Deoria, Ghazipur, Ballia, Mau Jaunpur and Sant Ravidas Nagar districts. The other districts of the same grade are scattered in nature and fail to form a

Table 3. District wise Literacy Rate and Urban –Rural Differentials in Literacy, Uttar Pradesh, 2001.

S/No.	District	All area	Rural area	Urban area	Differential index
1	Saharanpur	62.6	60.1	69.3	0.15
2	Muzaffarnagar	61.68	59.9	66.6	0.11
3	Bijnor	59.37	58.5	62.1	0.06
4	Moradabad	45.74	40.3	57.1	0.37
5	Rampur	38.95	34.2	52.2	0.46
6	Jyotiba Phulenagar	50.21	48.8	54.3	0.11
7	Meerut	65.96	63.9	68	0.06
8	Baghpat	65.65	64.6	70	0.08
9	Ghaziabad	70.89	64.4	75.9	0.16
10	Gautam Buddha Nagar	69.78	67.2	74	0.10
11	Bulandshahr	60.19	58.8	64.6	0.10
12	Aligarh	59.7	57.8	64.3	0.11
13	Hathras	63.38	62.6	66.4	0.06
14	Mathura	62.21	58.7	70.5	0.19
15	Agra	64.97	59	72	0.20
16	Firozabad	66.53	65.7	68.5	0.04
17	Etah	56.15	54.2	65.1	0.19
18	Mainpuri	66.51	65	75.3	0.15
19	Budaun	38.83	35.3	54.1	0.48
20	Bareilly	47.99	42.8	58.1	0.32
21	Pilibhit	50.87	48.5	61.2	0.25
22	Shahjahanpur	48.79	47.2	55	0.16
23	Kheri	49.39	47	68.3	0.43
24	Sitapur	49.12	46.5	67.4	0.42
25	Hardoi	52.64	50.7	66.5	0.30
26	Unnao	55.72	53	70.1	0.31
27	Lucknow	69.39	54.6	77.2	0.33
28	Rae Bareli	55.09	53	74.1	0.38
29	Farrukhabad	62.27	59.6	71.6	0.19
30	Kannauj	62.57	61.7	66.9	0.08
31	Etawah	70.75	68.6	77.6	0.13
32	Auraiya	71.5	69.5	82.9	0.19
33	Kanpur Dehat	66.59	65.9	75.7	0.15
34	Kanpur Nagar	77.63	69.2	81.5	0.16
35	Jalaun	66.14	63.8	73.6	0.15
36	Jhansi	66.69	58.4	78.1	0.29
37	Lalitpur	49.93	45.2	76	0.62
38	Hamirpur	58.1	55.1	72.8	0.31
39	Mahoba	54.23	50.2	68.1	0.33
40	Banda	54.84	51	73.7	0.41
41	Chitrakoot	66.06	64.7	78.7	0.21
42	Fatehpur	59.74	58.3	72	0.23
43	Pratapgarh	58.67	57.7	76	0.31
44	Kaushambi	48.18	47.1	61.9	0.31
45	Allahabad	62.89	56.5	80.7	0.39
46	Bara Banki	48.71	47.3	62.4	0.31
47	Faizabad	57.48	54.5	75.6	0.37
48	Ambedaker Nagar	59.06	57.7	73	0.26
49	Sultanpur	56.9	55.7	79.5	0.42
50	Bahraich	35.79	32.3	66	0.94

Table 3. Contd.

51	Shrawasti	34.25	33.5	58.2	0.72
52	Balrampur	34.71	32.1	63.1	0.89
53	Gonda	42.99	40.5	73.3	0.76
54	Siddharthnagar	43.97	42.9	70.2	0.62
55	Basti	54.28	52.7	79	0.48
56	Sant Kabir Nagar	51.71	50.5	67.4	0.33
57	Maharajganj	47.72	46.3	72.4	0.55
58	Gorakhpur	60.96	56.3	78.7	0.37
59	Kushinagar	48.43	47.3	71.2	0.49
60	Deoria	59.84	58.2	74.4	0.27
61	Azamgarh	56.15	56.8	48.3	-0.15
62	Mau	64.86	62.6	74.2	0.18
63	Ballia	58.88	57.7	68.9	0.19
64	Jaunpur	59.98	58.8	73.9	0.25
65	Ghazipur	60.06	58.9	73.5	0.24
66	Chandauli	61.11	59.2	76.1	0.28
67	Varanasi	67.09	63.5	71.3	0.12
68	Sant Ravidas Nagar Bhadohi	59.14	57.8	68.3	0.18
69	Mirzapur	56.1	53.7	70.7	0.30
70	Sonbhadra	49.96	41.3	83.6	0.85

Source: Calculated from Census of India, 2001, Registrar General, New Delhi.

Table 4. Category wise urban-rural differentials in Uttar Pradesh, 2001.

Category	No. of district	Districts (%)
Very high(> 0.60	7	10.00
High (0.45 - 0.60)	5	7.14
Medium (0.30 - 0.45)	20	28.57
Low (0.15 - 0.30)	24	34.39
Very low (< 0.15)	14	20.00
Total	70	100.00

notable region in the state. The districts of very low differential index (0.15 and below) covers about twenty percent of the area and has one distinct region in the western part of the state. These districts are Muzaffarnagar, Baghpat, Meerut, Jotiba Phule Nagar, Gautam Budh Nagar, Bulandshahr, Aligarh, Hathras and Firozabad. The other districts of the similar grade are scattered too sporadically to form a distinct region. The maximum decrease in urban-rural differential was in the district of Azamgarh (-0.15). In the district, the growth of rural literacy rates is higher than the urban literacy rate.

The general picture emerged from this discussion is that there is a gradual increase in urban-rural differential from western part to eastern part of Uttar Pradesh.

Rural-urban literacy rate

The regional dimensions of rural and urban literacy rate are shown in Figure 4. The districts with reference to percentage may be arranged into three categories, high, medium and low; these categories in terms of value are not found to be same. The figure reveals that about twenty-nine percent districts of the state lie under the low grade of rural literacy rate, of which eleven districts are associated with low, seven medium and only two districts with high urban literacy rate. A prominent region of low rural literacy with low urban literacy rate is found in the north-western part of the study area. Seven districts belong to medium literacy rate, majority of them form a continuous region in the north-eastern part. Two districts of low rural literacy rate with high urban literacy rate are scattered in the southern part and fail to form a notable region in the state.

Thirty-three districts lie under the medium grade of rural literacy rate, of which four associated with low, twenty medium and nine high score of urban literacy rate. Two dominant regions of medium grade are found in the south-central part and south-eastern part of the state. The largest one constitutes a continuous region which

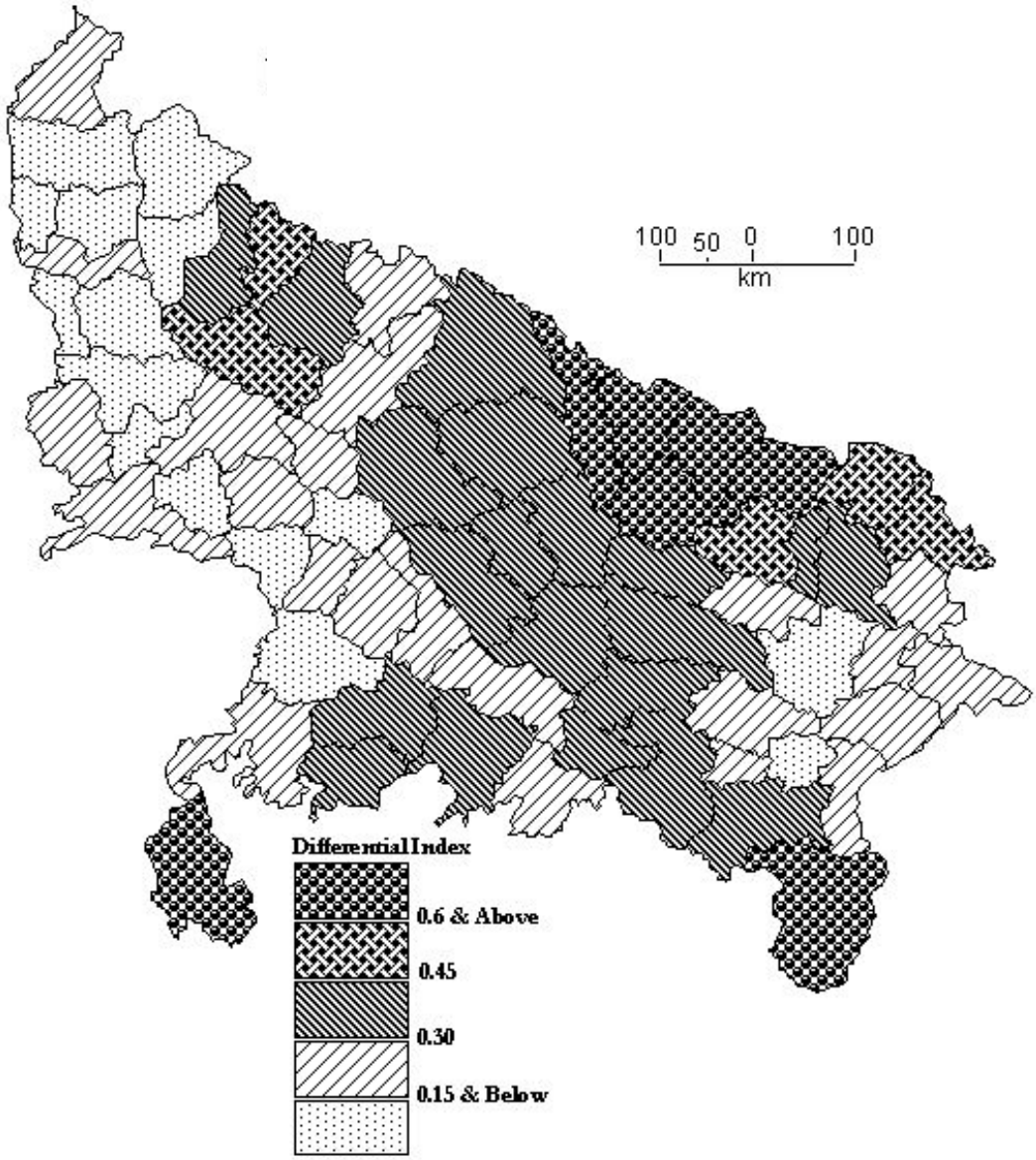

Figure 3. Uttar Pradesh urban - rural differentials literacy in 2001.

extends from Mathura district in the north to Mahoba district in the south. The second comprising eight districts of same grade are concentrated in the eastern part. The category of high literacy rate incorporates seventeen districts, ten belong to medium, seven to high and no districts are found in the low rate of urban literacy rate. The districts of medium grade of rural literacy with medium grade of urban literacy rate are scattered very widely over the state and fail to form a identifiable region in the state. Two small but identifiable regions of high grade of rural literacy associated with high grade of urban literacy rate are located in the western part.

The general distribution shown in figure is characterized by gradual increase in the level of literacy rate in respect to urban-rural rate from west to east.

Analysis

A simple association between urban- rural literacy differential index and each of the independent variables have been computed and tested, with the assumption that the relationships exist in all the cases. Selection of each variable is based on the ability to develop a rational hypothesis of relationship between the independent variables and the literacy differential index (Table 2).

Table 2 reveals that twelve variables out of twenty-two are significant at 99% level of confidence in their relationship with urban-rural differential index (Y_1). Among them four variables namely: X_7 (Rural population to total population, r = 0.338), X_{10} (Agricultural labourers to total workers, r = 0.408), X_{12} (Cultivators to total main workers

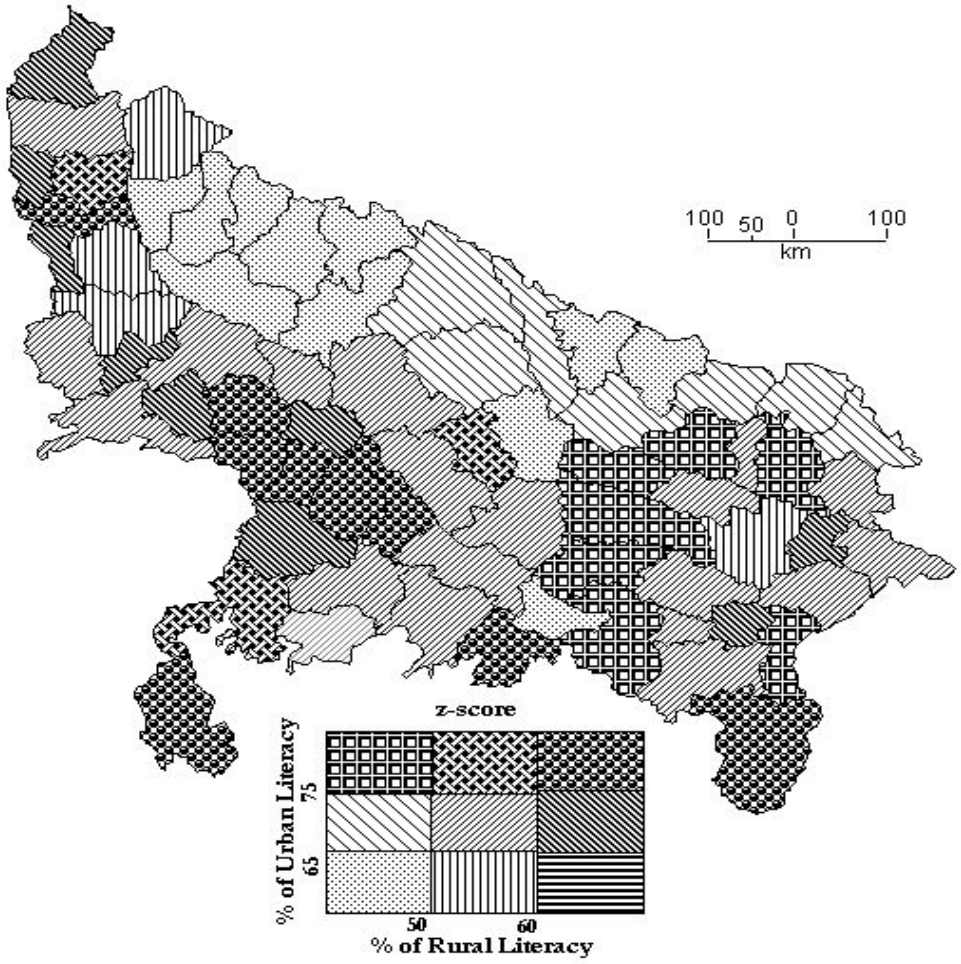

Figure 4. Uttar Pradesh urban - rural differentials literacy rate 2001.

workers, r = 0.447) and X_{13} (Agricultural labourers to total main workers, r = 0.337) are positively associated with urban-rural literacy index. Remaining eight variables X_1 (Literates in all areas, r = -0.731), X_2 (Literates in rural areas, r = -0.797), X_4 (Literate male in all areas, r = -0.711), X_5 (Literate female in all areas, r = -0.704), X_6 (Urban population to total population, r = -0.355), X_{15} (Other than household workers to total main workers, r = -0.461), X_{19} (Per capita income, r = -0.320), and X_{22} (Village in linked road, r = -0.429) are negatively associated with differential index. Besides these variables, the other variables which are found to have moderate correlation coefficient with Y_1 (Urban-Rural Differential Index) are quite significant. They are: $X_{11,}$ X_{14} and $X_{17.}$ The first obtains positive correlations and the remaining two yield negative correlation.

The explanation leads to the conclusion that literacy rate, male literacy rate, female literacy rate, urbanization, per capita income and the medical facilities are the chief determinants but the magnitude of their effects are dissimilar.

Conclusion

The analysis clearly indicates that there is a wide range of variations in rural-urban differential in literacy among the districts of the state. The observation further adds that the urban-rural differential indices in the western and central districts are relatively low as compared to the eastern and southern districts of the state. The statistical analysis revels that low urban-rural differential in literacy is characteristics of areas marked by relatively high degree of urbanization, literacy rate, educational facilities, medical facilities, commercialization of agriculture and dense road network. The districts (western part of Uttar Pradesh) which are near to the National Capital, the differential index was low due to urban industrial of the National Capital Region, high diversified economy, high degree of rural mobility, better avenue of employment and business proportion of non-agricultural workers and relatively high functional value of education among the ruralities. The districts having low level of development should be given top priority so that they may come up at

par with developed areas, and the concept of planning with social justice proves successful.

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