Editor: Prof. V.N. Sharma

Spatio-temporal analysis of trends and patterns in change of male-female literacy in Malda district, W.B.

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Abstract

In the present paper, the regional disparity in male-female literacy is highlighted with special focus on spatial and temporal variation at the block level in Malda district of West Bengal. Despite India's achieving universal elementary education, reaching the goal of full literacy is rather difficult owing to the female illiterate population across India's states and districts. According to the 2011 Census of India, the overall literacy rate in the country is 74 per cent, while for male it is 80.9 per cent and 64.6 per cent for female. In the same Census, the respective literacy in Malda districtwas 61.73 per cent in total, while 66.24 per cent for male and 56.96 per cent for female. And within that figure, nearly 40 per cent of males are illiterate, compared with more than 60 per cent of the female. This paper also makes an attempt to map out the comparative analysis of male-female literacy disparity and find out possible reasons.The study is based on secondary data obtained from statistical handbook, UDISE, and Census of India.Sopher method has been used to calculate disparity among male-female literacy and Coefficient of Variation has been used to measure intra-block variation in male-female literacy from 1991 to 2011. After 1991, study founds a swift decline in male-female literacy gap in the study area.It has also found that in between 1991 and 2011, intra-block variationsin male-female literacy reduced by five times in the study region. The study suggests thatthe new strategies and appropriate programmes like universal elementary education should be implemented at its widest sprit in order to realize the goal of full literacy and bridging the gap between male and female literacy. Special provision should be made to bring back 'out-of-school-age' illiterate populationespecially the girls, drop out children and left behind females who were never been in school. To realise the goal of full female literacy, study also suggests the provision of an effective adult-literacy programme with the focus on school left-out female above the age group of thirty.

Keywords : disparity, universal elementary education, literacy, spatio-temporal, coefficient of variations.

Introduction

According to the census enumeration, 'a person above the age of seven, who can read and write with understandings in any language, is considered to be 'literate'. The person may or may not have received any formal education(Roy & Mondal, 2015). This is the simplest and widely used indicator to assess and compare the progress in educational develop-

ment across India. The United Nations' Universal Declaration of Human Right recognizes literacy as a fundamental right of every individual.

According to Census information, the National literacy level rises up from 64.8 per cent in 2001 to 74 per cent in 2011 (RGI 2011a). Although this is a welcome trend, any observation regarding progress in literacy based on its aggregate level may well be misleading without accounting for the differences across spatial disparity, male-female gap and variation therein.

On the eve of India's independence, the founders of the country's constitution fully recognised the role of education in the nation's socio-economic development. However, providing everybody with basic skills in reading and writing was a herculean task, owing to its large number of uneducated citizens. According to the first population census of independent India, conducted in 1951, only 18.3 per cent of the people counted as literate in which 8.86 per cent were female and 27.16 per cent were male (RGI 2011a). Policymakers stressed the need to provide elementary education for children between 6-14 years of age and adult education for individuals 15 years and above, in order to achieve full literacy. Special provision was made with the equal participation of male-female in the existing schooling system.

Article 45 of the Indian constitution made the provision of free and compulsory education for all children up to 14 years of age. The implicit assumption at the policy level seemed to be that expansion of elementary education would take care of the problem of mass illiteracy. The National Policy on Education(1986) envisaged universal primary education by 1990 (Shukla & Mishra, 2017). This policy, as revised in 1992, intended two distinct policy initiatives; namely, Sarva Shiksha Abhiyan (SSA) and the Mid-Day Meal Scheme (MDMS). Parliament has since passed the86th Constitution Amendment Act (2002), to make elementary educa-

tion a fundamental right (Pt. III, Art. 21A) and to make it a fundamental duty (Art. 15A) of parents and guardians to provide their children aged 6-14 with opportunities for education. The 86th Constitution Amendment Act has been a path-breaking step towards the growth of education, especially for females. Similarly, the Right to Education Act (2010) makes elementary educationto all children above seven years as a fundamental right. As a result of a number of policy interventions and constitutional provisions, universal elementary education (UEE) is becoming a reality.

To foster the growth of female education government has undertaken several schemes under the umbrella of Sarva Shiksha Abhiyan (SSA). Kasturba Gandhi Balika Vidyalaya Scheme (KGBV) was first ever gendered perspective education for the underprivileged in rural areas where literacy level is very low. National Programme for Education of Girls at Elementary Level (NPEGEL) has been set up to provide better opportunities to girls' education.

In India, women face much discrimination at every level in society: they are not treated as at par with men, socially, economically and as a result, they fall far behind men in almost all spheres of life (Katiyar, 2016). This simple fact is evident from the reports of several committees constituted at various levels for the development of women. The National Committee on Women's Education (1957-1959), chaired by Smt. Durgabai Deshmukh made a strong recommendation for the education of women. Committee states that it should be a top priority, the report suggested that bold and determined efforts should be made to narrow down the existing gap between the education of men and women in as short a time as possible(Katiyar, 2015). The National Policy on Education (1968) stressed that the education of girls should receive priority, not only for the sake of social jus-

tice but also because this would be a tool for the social transformation

The issue of women's literacy is directly connected to the problem of poverty and hence there is a serious need to pay attention to economic barriers (Dighe, 1991). To increase literacy rates and eliminate dropouts, children from all social groups should be given free food and shelters as well as compulsory education (Thanragaj, 1995). Literacy is a tool to empower women in the wider struggle against inequality and injustice in society (Patel & Dighe, 1997). There is a need to implement literacy programmes as an integral part of an integrated rural development programme with a provision of vocational skill development and income generation programmes because literacy has a link with both societal needs and national development (Das & Singh, 2002). The administrator must pay greater attention to bridging the gap between the literacy of males and females in both rural and urban areas (Grover & Bhardwaj, 2002). The education disadvantageous class such rural women have been characterised by low literacy rates, high dropout rate as well as by the persistence of highly discriminatory malpractices (Katiyar, 2016). Socially weaker section, such as women, do not recognise the value of educating girls and the problems of access, quality, content and the devaluing of non-formal education reduce enrolment (Swamy, 2013). With this background, an attempt has been made to analyse spatial and temporal disparity and inter-block variation in male-female literacy in Malda district of West Bengal.

Study Area

The district lies between 24°40'20" N to 25°32'8" N latitude and 87°45'50" E to 88°28'10" E longitude. Malda district is bounded by Murshidabad from south, by Uttar Dinajpur district in the north, in the east by Bangladesh, and the state of Bihar to its west, by Dakshin Dinajpur districtin the northeast and Jharkhand to its southwest. The district is spread over an area of approximately 3,733 sq km and is located at distance of 365 km from Kolkata, the state capital. Malda has 15 blocks divided into two Sub Divisions, viz. Sadar and Chanchal. The district headquarters is Englishbazar.

Spreading over an area of 3733 sq.km with a population of 39.89 lakh in 2011, the district of Malda covers 4.7per cent of the total area of the state and is the home to 4.1per cent of the total state population. The population density of the district is 1069 persons persq km as compared to West Bengal, which is 1028 persons per sq. km. A total number of male population is 20.51 lakh, while the female population is19.37 lakh.Malda district of West Bengal has been chosen as the study area because of persistence disparity in male-female literacy. In West Bengal, Malda ranked third in ascending order in terms of female literacy in 2011.

Data sources and methodology

The present study is based on primarily and secondary sources of data mainly extracted from Census on India, District Statistical Handbook of Malda, Unified-District Information System for Education (UDISE) and School Report Card (SRC). Besides, some other reports and government publications have also been used to supplement our analysis. Obtained data has been processed on excel sheet.

To show male-female literacy disparity, Sopher method of Disparity Index has been used and the values are calculated for the census year of 1991, 2001 and 2011.

$$D = Log(X2/X1) + Log\,[(Q-X1)/(Q-X2)]$$

Where, X2> or = X1 and Q = 100

In the present study, group 2 is taken for male literacy, having comparatively higher value and, group 1 for female literacy that have rela-
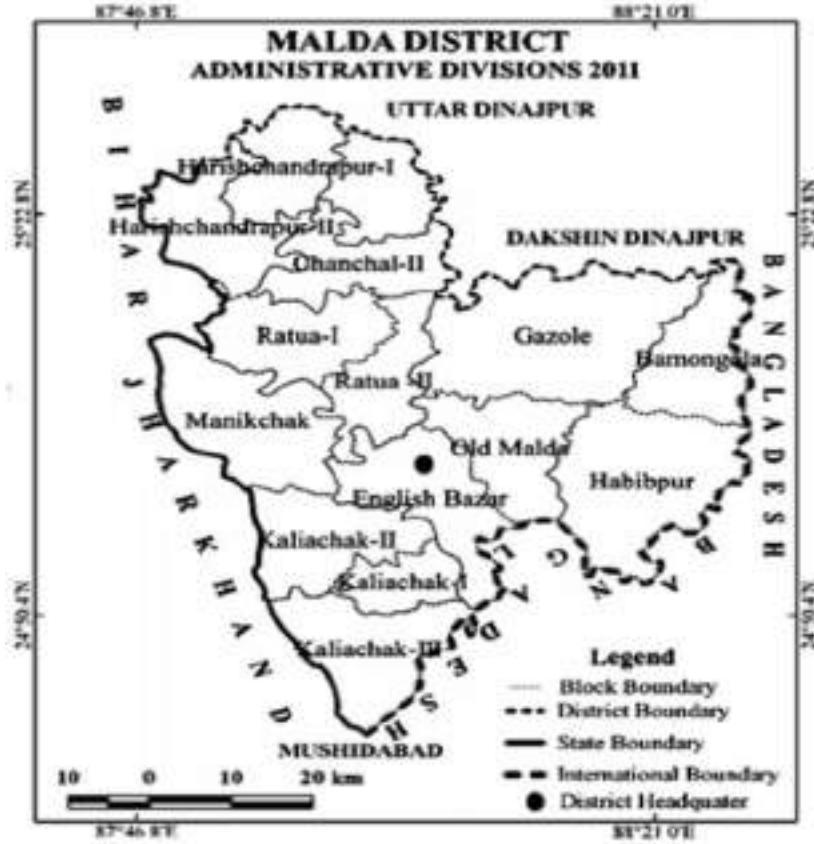
Figure 1 : Location of the Study Area

tively lower value.In case of perfect equality i.e. nodisparity at all, the value of D will be zero. The measured value of D is interpreted as - higher the value of D higher the extent of disparity and lower the value of D shows lower disparity.

For intra-block variation in male-female literacy from 1991 to 2011, Coefficient of Variation (C.V) has used.

The calculated value of C.V lies between zero to one. In case of perfect equality i.e. no disparity at all the value of C.V will be zero and higher the calculated value of C.V, greater the degree of variation in the series of observation.

To show the spatial pattern of literacy disparity at block level QGIS 2.14 and ArcView

$$\text{The coefficient of Variation (C.V.)} \ = \ \frac{\text{(Standard Deviation)}}{\text{Mean}}$$

3.2 software have been used. The displayed value has been categorised under three classes under Natural Break caption in QGIS and ArcView software. Due to the higher degree of variation in end data level from 1991 to 2011, no common scale in class categorizations has been fixed from researcher's end.

Results and discussion

Table 1 :Trends of Literacy Rate

Year	India			West Bengal			Malda		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
1951	27.23	8.90	18.31	34.60	13.20	24.90	18.10	5.00	11.68
1961	40.40	15.47	28.30	46.50	20.32	34.50	25.70	7.02	16.60
1971	46.00	22.00	34.45	49.50	26.50	38.91	29.90	11.20	20.86
1981	56.40	29.80	43.65	57.10	34.40	46.38	36.10	16.30	26.52
1991	64.10	39.30	52.21	67.80	46.60	57.73	45.60	24.92	35.62
2001	75.80	54.20	65.38	77.10	59.60	68.64	58.80	41.25	50.28
2011	82.14	65.46	74.04	82.67	71.16	77.08	66.24	56.96	61.73

Source: Census of India

The table No. 1 shows the trends of literacy pattern of the country, state and district since 1951. It has been noted that the literacy rate of the total population has been 18.31 per cent in 1951 and has further increased up to 74.04 per cent during 2011. Similarly, in 1951, 27.23 per cent of male and just 8.90 per cent of female were found as literates, which have increased to 82.14 per cent and 65.46 per cent respectively. Similar increasing pattern found for West Bengal and Malda. Male-female literacy rises up from 34.60 and 13.20 per cent to 82.67 and 71.16 per cent for West Bengal and 18.10 per cent to 5.00 percent for Malda. This is possible because of the 'national literacy mission' drive launched by the Government of India which has created a new scope of immediate awareness to supply the energy for rapid growth of literacy in the country as a whole.

However, it is quite surprising to note that, though the literacy rate of the total population is comparatively higher than female but male-female gap has formed persisting feature for all three levels. For Malda, after 1991 literacy rate shows a swift rise, still though, it below than national and state average. In 2011, the literacy rate among the female for Malda stood around 56.96 per cent but 14.20 and 8.30 per cent lower than the State and National average.

Hence, the analysis depicts that though the proportion of literates among both male and female has increased over the time period of 1951 to 2011, yet the positions of the district from the reference point of the state and national average remain almost unaltered. It is noteworthy to mention that, in the case of female literacy in Malda, the scenario has improved from 1991 to 2011.

In Table 2 calculated value stood for intra-block variations in male-female literacy variations from 1991 to 2011. District C.V value for female found 0.23 unit difference which is more

Table 2 : Coefficient of Variation value on Male-Female Literacy from 1991-2011

Block	Male	Female
Harishchandrapur-I	0.19	0.40
Harishchandrapur-II	0.19	0.47
Chanchal-I	0.17	0.34
Chanchal-II	0.19	0.43
Ratua-I	0.21	0.47
Ratua-II	0.20	0.43
Gazole	0.22	0.50
Bamongola	0.25	0.40
Habibpur	0.15	0.30
Old Malda	0.18	0.43
English Bazar	0.15	0.40
Manikchak	0.21	0.46
Kaliachak-I	0.21	0.43
Kaliachak-II	0.26	0.48
Kaliachak-III	0.22	0.50
District	0.20	0.43

Source: Value calculated by authors, (based on Census Table 2011.a)

than the double gap from the male. In male literacy, less than 0.20 point variation recorded in seven blocks while eight blocks lie above it. Least variation of male literacy for three census years, i.e., 1991, 2001 and 2011 found in English Bazar (0.15) and Habibpur (0.15) while highest variations recorded in Kaliachak-II (0.26) and followed by Bamongola(0.25) and Kaliachak-III (0.22). In figure 2 C.V of 1991 for Harishchandra Pur-I start from 0.40 and with 0.21 point lags of male i.e. 0.19. The gap between the highest and lowest C.V value in male-female are 0.24 and 0.15. Two blocks come under 0.40 CV value, seven under 0.45 and six valued more than 0.46 C.V value in the female category. Intra-block variation in female literacy though recorded 0.20 point gap but the concentration of blocks above 0.40 are twelve. Except for three blocks, the calculated value of female literacy recorded doubled gap than male.

Figure 2 represents more variation in C.V value for female than their male counterpart. The linear line of female moved across nine times of actual graph while male curve progressed across five times of actual male graph. The fe-
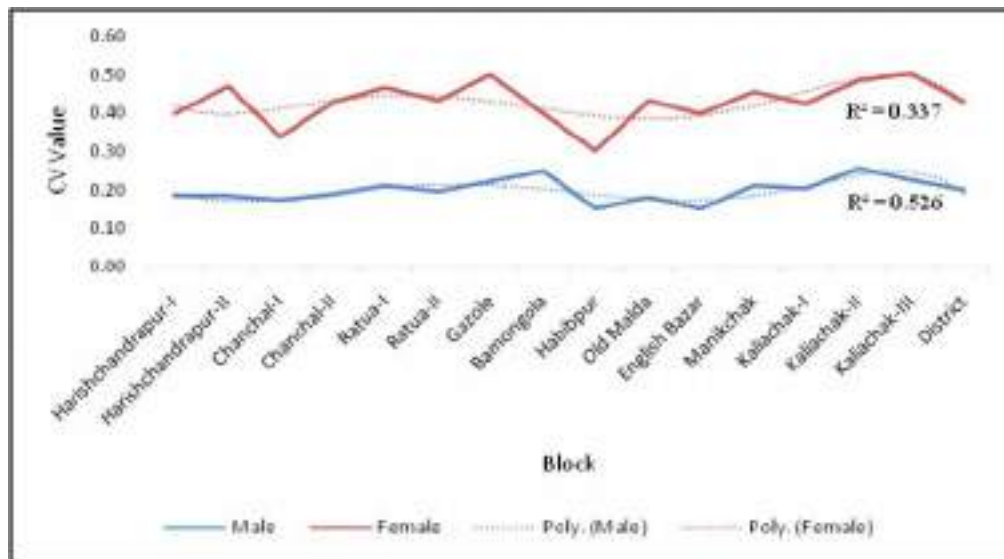

Figure 2 : Intra-block Variation in Male-Female Literacy (in CV) from 1991-2011

male C.V line (actual) also substantiate moving variation with almost continuous direction while male curve indicates sudden variation with limited moving extent. Therefore, a pattern evolves from female C.V in intra-block variation is more prominent and continuous than male C.V.

Gender-biased literacy in India found its roots in Gross Enrollment Ratio of female students, the distance of school from home, and limited infrastructure such as, female teacher, separate classroom, toilets, playgrounds, mid-day meal (Digh, 1991). Socio-religious background also plays an important role in school-based learning(UNESCO on India, 2001).

In the district of Malda,gross enrolement of male-female students in general schools including primary, secondary, high school and special and non-formal institutions have shown in figure 3. It shows a declining gap in enrolement of male-female students in general school from 1995-96 to 2007-08. Both curves merge in 2007-08 meaning by no disparity found in terms of gross enrolment. Female enrolement rises up and increased enrolment over male students. In pri-

mary and upper primary schools, female students enrolled more than male but in high schools, senior secondary, degree colleges and in technical institutes male dominate enrolment still evitably persist. Early marriage, the burden of households works, and pessimistic approach about end effect of education bars in rural female education in India. From 2013 onward, girls enrolments in higher secondary and colleges became female favoured. Policy outcome of central government about female education, girl favoured and specific facilities by the state government have found its effects in the recent change of enrolment and participation (Roy & Mondal, 2015).

Table 3 on the correlation matrix of the selected variable have been computed on block level data where total literacy found the significant correlation with the number of institutes, students and teachers for 1991. It meaning out thereby, apart from the said reasons literacy rate of both sexes, male, female and total literacy indicate its root determinants as the institute, students and teachers.
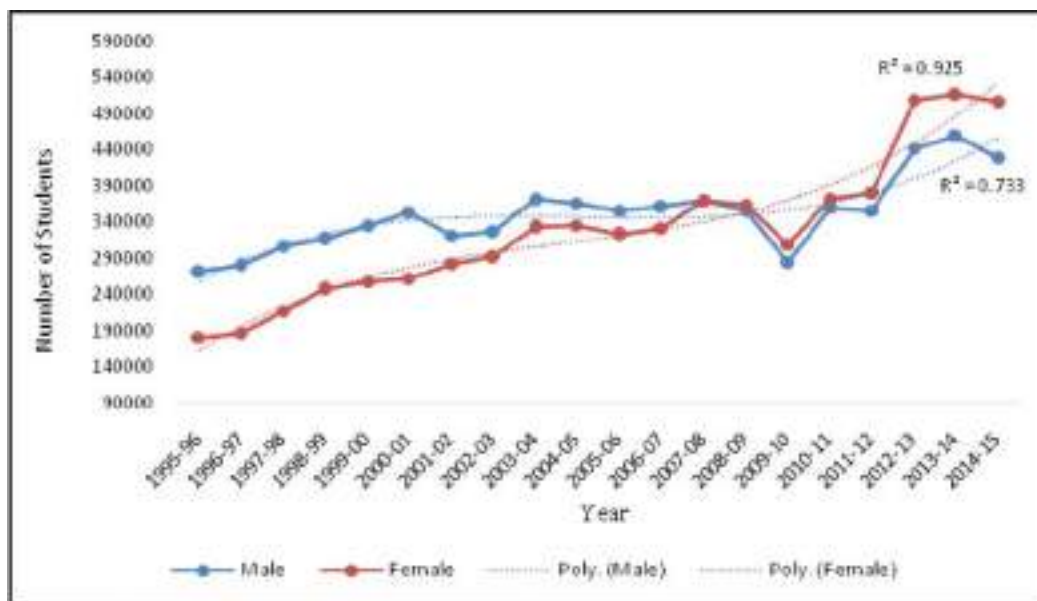

Figure 3 : Number of Students by Sex in General Education in Malda

From 1990-91 to 2010-11, the number of students in general education increased almost four times. In the same period, the number of

Table 3:Correlation Matrix, 1991

	Male Literacy	Female literacy	Total Literacy	Institute	Student	Teacher
Male Literacy	1					
Female literacy	0.83	1				
Total Literacy	0.96	0.96	1			
Institute	0.75	0.64	0.61	1		
Student	0.66	0.72	0.75	0.90	1	
Teacher	0.77	0.78	0.80	0.75	0.83	1

Source : Calculted by Authors (obtained from Statistical Handbook of Malda District, 1992)

institutions and teachers rise up just 0.7 and 0.9 times respectively. Table 4 do not found institutions and teachers as much significance as it was in 1991. Out-migration of male students as workforce, poverty and a growing number in workforce participation of male toward cities contribute significantly in lowering down male enrolment in schools and further studies (Township, n.d.). Correlated matrix value of institute, student and teacher for 2011 give direction about another variable which comes up as a sign in the rise of female and total literacy.

Spatiotemporal distribution of literacy gap of male-female from 1991 to 2011 as depicted in Figure 4. District means gap for 1991, 2001 and 2011 were 0.33, 21 and 12 respectively. In 1991, all the block recorded higher gap than two successive years. Kaliachak-III, with 0.40 index value rank top while Chanchal - I with 0.25 index value lie in the least at the ranking ladder. With 0.21 disparity index for the district in 2001, Habibpur recorded the highest gap with 0.26 index value while Chanchal - I and Kaliachak - I placed last with 0.17 index value.For 2011, district index value has fallen from 0.21 to 0.12 caused by increased in Gross Enrolment of girls in Primary and Secondary classes 2007-08 onward Habibpur found 0.17 index value while Ratua-II evolves as the least disparity block for 2011 with index value 0.07.

Spatial Analysis of Disparity Index

Spatial-temporal distribution of Sopher In-

Table 4: Correlation Matrix, 2011

	Male Literacy	Female literacy	Total Literacy	Institute	Student	Teacher
Male Literacy	1					
Female literacy	0.74	1				
Total Literacy	0.94	0.92	1			
Institute	0.22	0.34	0.40	1		
Student	0.54	0.43	0.51	0.45	1	
Teacher	0.20	0.53	0.53	0.59	0.67	1

Source : Calculted by Authors (obtained from Statistical Handbook of Malda, 2012)
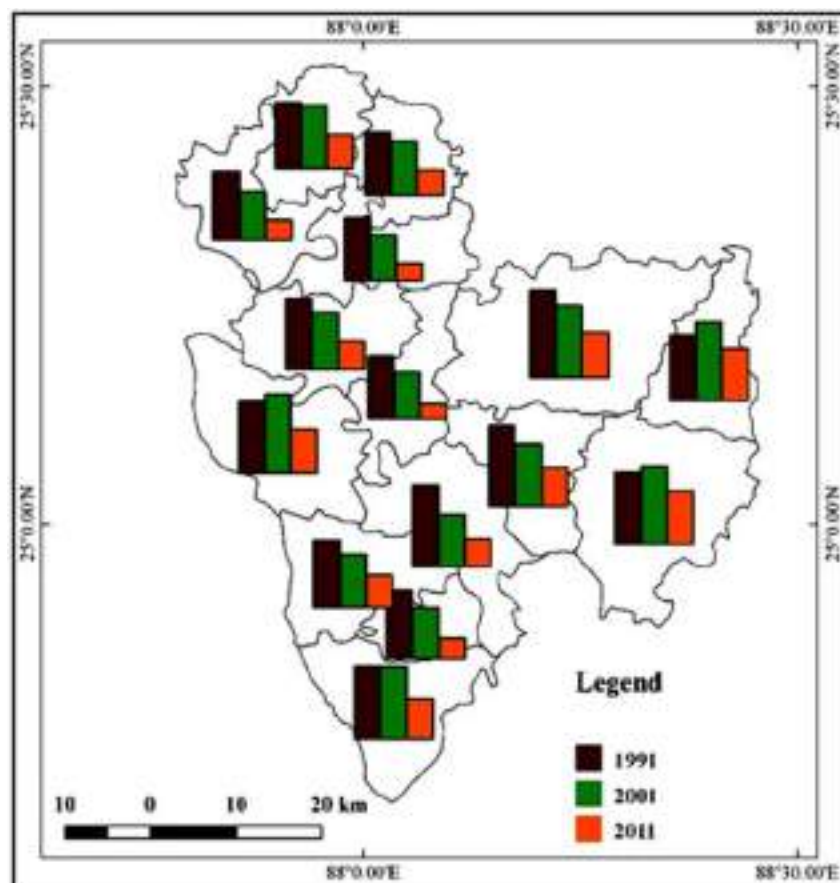
Figure 4: Pattern of Male-Female Literacy Disparity

dex value has been categorised into three classes for mentioned census year as High, Medium and Low. Due to high variability in data, the common index value is not the possible basis of categorisation. Therefore, classes were framed in QGIS 2.14 labelled at Natural Breaking. Since the gap of index value is different, therefore, not the value but blocks have taken as basis of comparison.

Male-Female Disparity 1991

Figure 5 shows that the spatial distribution of Sopher disparity index for 1991. Two out of fifteen blocks fall in the high category with 0.367-0.420 index value. Gazole and Kaliachak-III are such blocks where teachers and institu-

tion have found a significant correlation with girl's literacy. Harishchandra Pur-I, and II, Kaliachak II, Ratua-I, Manikchak, Old Malda and English Bazar have been placed in the medium category with index value 0.308-0.367. Remaining blocks found comparatively low index value ranging from 0.308 to 0.249. Number of teachers have found high significant matrix value and hence, low disparity depicts for Chanchal-I and II, Ratua-I, Bamongola, Habibpur and Kaliachak-I.

Male-Female Disparity 2001

Manikchak, Habibpur and Kaliachak- III have found high disparity with index value 0.239-0.272. In comparison to last year Kaliachak -III

Table 5 : Sopher Disparity Index

Block	1991	2001	2011
Harishchandrapur-I	0.33	0.22	0.13
Harishchandrapur-II	0.35	0.19	0.09
Chanchal-I	0.25	0.17	0.10
Chanchal-II	0.30	0.17	0.08
Ratua-I	0.34	0.20	0.11
Ratua-II	0.31	0.16	0.07
Gazole	0.42	0.23	0.15
Bamongola	0.28	0.24	0.16
Habibpur	0.28	0.26	0.17
Old Malda	0.37	0.21	0.13
English Bazar	0.33	0.18	0.10
Manikchak	0.35	0.27	0.15
Kaliachak-I	0.30	0.17	0.09
Kaliachak-II	0.32	0.19	0.12
Kaliachak-III	0.40	0.27	0.14
District	0.33	0.21	0.12

Source: Calculated by Authors (literacy data from Census of India)

remain on the same category. Here the number of institution found significant correction matrix value. Harishchandra Pur-I, Ratua-I, Gazole, Bamongola and Old Malda have come under a medium category. Harishchandra Pur-I, Ratua-I and Old Mlada have remained in medium category with the comparison to 1991. Seven out of fifteen blocks have placed in the low category with Kalichak-I, Ratua-II, Chanchal-I and II remained in the same category.

Male-Female Disparity 2011

Four blocks namely Gazole, Bamongola, Habibpur and Manikchak have come under high category with index value 0.138-0.170. Except for students-teacher, no other matrix value found the significant correlation with regard to literacy. Habibpur and Manikchak have remained in the same category with respect to 2001. Harishchandra Pur-I, Ratua-II and Old

Malda were unchanged blocks with the comparison to 2001. Chanchal-I, English Bazar, Kaliachak-II and III were added to the list of Medium categories with the index value of 0.089-0-138. Remaining four blocks with index value 0.073-0.089 were placed in the low category. Kaliachak-I, Ratua-II, Harishchandra Pur-II and Chanchal-II have remained in the same category. Teacher in total literacy found significant correlation matrix value and hence these blocks were in a low category.

Comparative Analysis

All these blocks found continuous fall in index value for three census years. In terms of parity in male-female literacy Chanchal-I, Chanchal-II and Kaliachak-I do found continuous fall from mean. Highest fall in mean deviation recorded in Chanchal-I block. High index value falls for three years recorded in Gazole
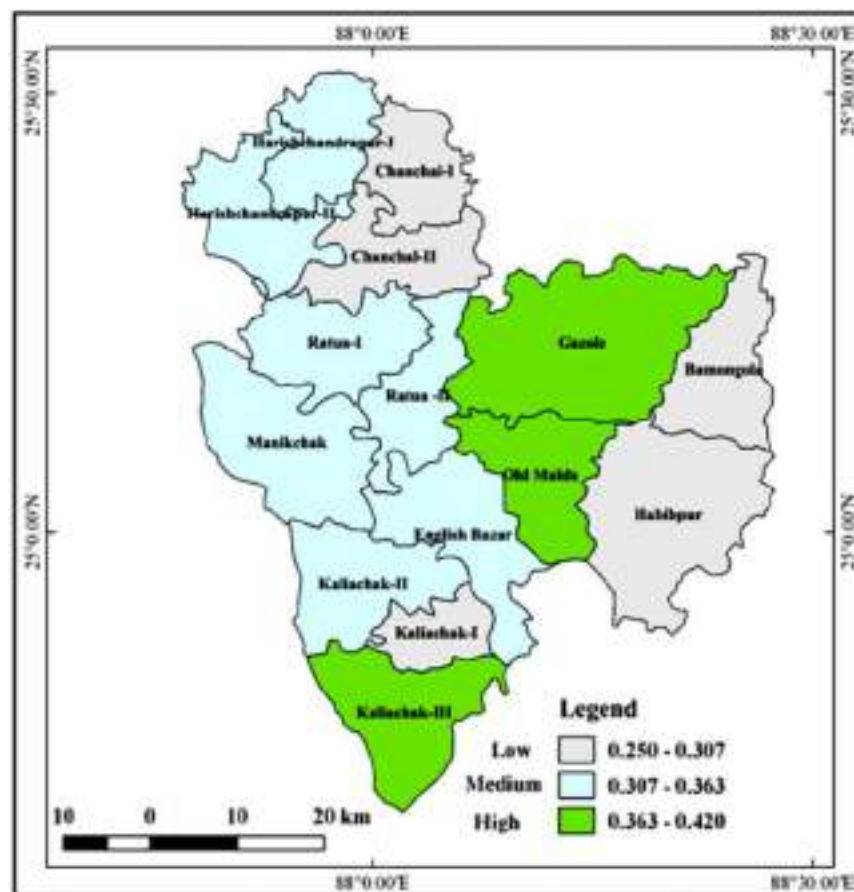
Figure 5 : Sopher Disparity Index, 1991

followed by Kaliachak-III, Old Malda, Manikchak and Harishchandra Pur-I. Ratua-II and English Bazar shows swift fall in index value in mentioned three years.

Conclusion

This paper provides an insight into the existing pattern of literacy rate, intra-block variation therein and the level of disparity of male-female literacy in Malda district of West Bengal.The analysis depicts that the proportion of literates among both male-female has been showing an increasing trend over the past three decades. In fact, though the literacy gap declines from 1991 to 2011 yet, the literacy rate of female still lags behind. This shows the awful con-

dition of the female literacy in the country even after six and half decades of independence. The study, reveals that two blocks namely Chanchal-I and Chanchal-II have minimum disparity with a continuous fall. Moreover, the block of Gazole has the maximum gap with swift fall and Kaliachak-III, Old Malda and Manikchak are next on the same line. The overall study concludes that there hasbeen a direct relationship between total literacy, male and female literacy. There is no block in Malda which has a better rate of female literacy than males. To raise overall literacy of female compared with male, age-cohort based literacyis essential. According to 2011 census, district has 45 per cent women above the age group of thirty. We propose broad-
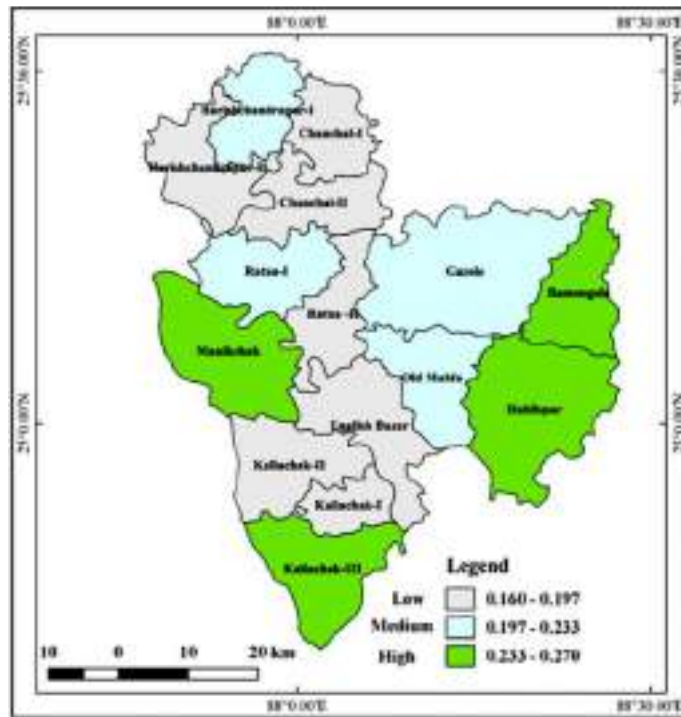
Figure 6 : Sopher Disparity Index, 2001

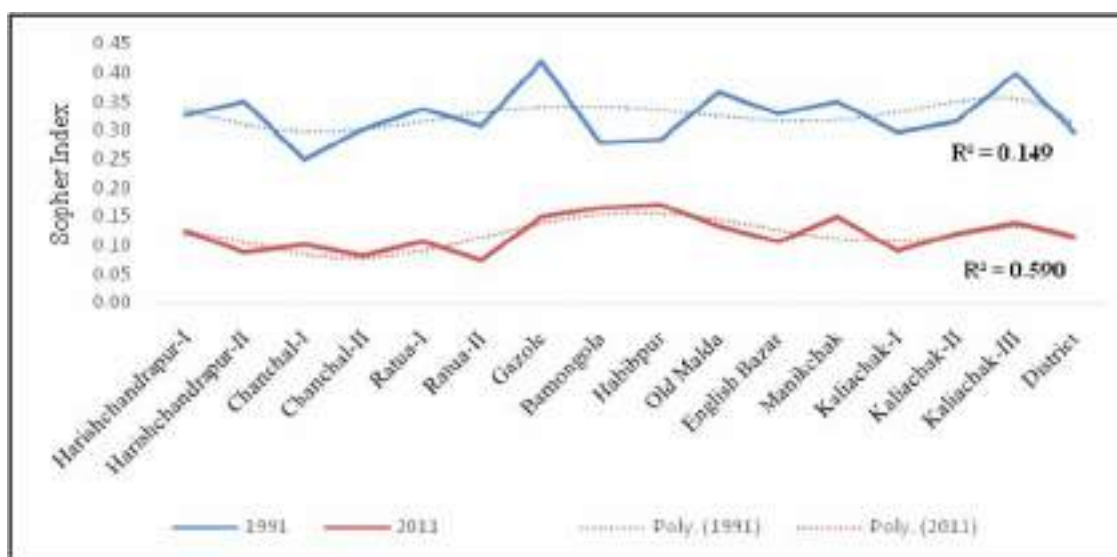Figure 7 : Sopher Disparity Index, 2011

Figure 8 : Comparison in Literacy Disparity Index - Malda

ening the scope of basic literacy programmes and their coverage beyond the 15-35 age group. Thus, we suggest that Malda needs of an effective adult-literacy programme in order to realise the goal of full female literacy.

References

Das, Y. L., and Singh, S. N., 2002, Literacy campaign in Bihar: Problems and prospects, *Indian Journal of Adult Education* (New Delhi), 63(4), October-December, 32.

Dighe, A., 1991, Women and literacy: Some policy considerations. *Indian Journal of Adult Education,* New Delhi, 52(1&2), January-March, April-June, 58.

Government of India, 1986, National Policy on Education, pp. 7-8, 41, New Delhi: *Department of Education, Ministry of Human Resource Development.*

Grover, R. P., and Bhardwaj, R., 2002, Gender Inequity in Literacy in Haryana: An analysis, *Indian Journal of Adult Education,* New Delhi, 63(4), October-December, 61.

Katiyar, S.P., 2015, Growth of Literacy in India - A Trend Analysis, *Indian Journal of Adult Education,* 76(1): 5-23.

Katiyar, S.P., 2016, Gender Disparity in Literacy in India, *Social Change,* 46(1): 46-69.

Patel, I., and Dighe, A., 1997, Gender Issues in Literacy Education, *Journal of Educational Planning and Administration,* 11(2), April, 161.

RGI, 2011b, Rural Urban Distribution of Literacy (chapter 3), *Provisional Population Totals, Paper 2 ofcensus 2011.* New Delhi: Office of the Registrar General and Census Commissioner of India.

Roy, D. and Mondal, A.,2015, Rural Urban Disparity of Literacy in Murshidabad District, WB, India, *International Research Journal of Social Sciences,* 4(7), 19-23.

Shukla, V., and Mishra, U. S., 2014a, Literacy Progress in Uttar Pradesh: A District Level Analysis, *Indian Journal of Human Development,* 8(1), 171-182.

Shukla, V. and Mishra, U.S., 2017, Literacy achievement in India: A demographic evaluation, prospects, *Comparative Journal of Curriculum, Learning, and Assessment,* 47(3):

257-274. https://link.springer.com/article/ 10.1007/s11125-018-9429-x

Sopher, D.,1974, Measurement of Disparity. *The Professonal Geographer,* 26(4), 4.

Swamy, R. N., 2013, A bird's-eye view of problems plaguing tribal women's literacy in India, *Indian Journal of Adult Education, New Delhi,* 74(4), October-December, 31

Thangaraj, M., 1995, Analysis of Literacy by Social Groups in India, *Indian Journal of Adult Education,* New Delhi, 56(4), 12

Township, B. P., 2011, Minority Concentration District Project Malda , West Bengal Executive Summary Sponsored by the Ministry of Minority Affairs Government of India, *Centre for Studies in Social Sciences , Calcutta,* (91).

UNESCO, 1978, Literacy in Asia: A continuing challenge. Report of the UNESCO Regional Experts Meeting on Literacy in Asia (Bangkok, 22-28 November 1977). Bangkok: UNESCO.

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Agricultural Change in India: Emerging Scenarios

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Abstract

The situation of Indian agriculture has undergone considerable changes since 1990s due to economic reforms introduced in 1991 and the consequent economic liberalisation. After the implementation of micro economic framework, public and private sectors have shown interest in direct investment in rural areas to take advantage of changes in rural enterprises, liberal trade and market policy, etc. Desirable changes in farm technology and new economic policy have contributed to the rise in agriculture productions. Many scholars have tried to study the impact of economic liberalisation on Indian economy and quite a few of them have specifically studied the impacts on Indian agriculture. The present attempt is to critically review them. Our analysis reveals that after the initiation of the economic reforms, rural economy has got gradually integrated and has witnessed changes in the nature practiced agriculture, especially during last two and half decades.

Keywords : agriculture, economic liberalization, green revolution, new economic policy, rural economy.

Introduction

Agricultural sector occupies a key position in the Indian economy. Around three- quarter of rural populations generate their income through agriculture in India (Astha, 2006). Swaminathan (2009) has rightly observed that, "agriculture is not just a food providing machine but the backbone of the livelihood of sixty nine percent people of India" (p. 12). However, agricultural sector in India has undergone significant changes and transformation during the last sixty years. The underlying factors for these changes have varied in different periods. During the 1950s and the 1960s, institutional reforms like land consolidation, changes in tenancy laws, development of irrigation and other agriculture related infrastructure played a major role in output change (Pandey, 1994).

The decades of 1960s and 1970s witnessed high growth in public investment in agriculture which improved infrastructural base for growth of output in the country in the following decades. But, the 1980s showed decline in the public investment in agriculture along with a considerable rise in the level of input subsidies. The declining trends in public investment in irrigation continued during the 1990s along with rising trend in the input subsidies. In 1991, the New Economic Policy (NEP) was introduced which brought significant changes especially in the exchange rate and external trade policy. The

reform measures initiated under the Structural Adjustment Programme (SAP), in turn, affected domestic prices of several commodities as a result of which terms of trade became favourable to agriculture for some years during the early nineties and then reversed from 1995 onwards (Chand, 2002). The World Trade Organization (WTO) officially started on the January 1, 1995 under the Marrakesh Agreement which was signed by 124 nations on 15 April 1994. Thus, it replaced the General Agreement on Tariffs and Trade (GATT). The Agreement on Agriculture (AoA), an international treaty of the WTO, negotiated during the Uruguay Round of the GATT, came into force with the establishment of the WTO. It was expected to bring significant changes in the agricultural sector through changes in cropping pattern in favour of crops that are demanded globally, increase in export demand, and increase in private investment, technology and high rates of change in the long run (Ahmed, 2009). Unfortunately, these subsidies failed to compensate the farmers for the negative impact of lower administered price paid on output, discrimination against agriculture due to overvalued currency and higher input prices due to excessive protection given to industry. As argued, the net effect was that agriculture had negative protection and was discriminated against (Gulati and Sharma, 1994). Prior the Green Revolution in India, agriculture did not generate sufficient production to meet the country's food requirements. In the past this had led to periodic food shortages and famines which were managed by huge imports of cereals from other countries. During the period of Green Revolution it was attempted to break these conditions and increase food production within the country for making the country self-sufficient. The era of Green Revolution resulting in 'new inputs' was high-yielding varieties of seeds, fertilizer, irrigation and crop protection technologies which raised production but accessibility of

these inputs was not of uniform nature for every farmers at ground level due to caste and class factors. Previous works have shown clearly that in northern plain of India the Green Revolution resulted in drastic increases in both yield per hectare and per capita income. But, the same was not uniform (cf. Frankel, 1971; Griffin, 1974; Sen, 1974; Day and Singh, 1977). The present paper makes a brief analysis of the nature of agricultural change after the economic liberalisation in India.

Objective and Methodology

Selected literatures were considered pertaining to the 1990s and afterwards for reviewing the nature of agricultural changes in this period focusing on major issues. The following discussions are organised into six sections: agricultural policy, credit, technological change, production, social change, and integrating the rural economy.

Agricultural Policy

Introduction of economic reforms in India in 1991 brought about fundamental changes in macro economic and trade policies, completely altering the agricultural policy framework which had prevailed during the planning period prior to the 1990s (cf. Bhalla and Singh, 2012). The initiation of economic reforms brought about major changes in the macroeconomic policy framework of the planned economy that existed in India during 1950-51 to 1990-91. This, in turn, was supposed to promote exports leading to rapid agricultural growth. The existing literature presents a number of arguments both in favour of and against trade liberalisation in agriculture. The arguments in favour of trade liberalisation in the Indian context focus mainly on the discrimination faced by the agricultural sector under the import substitution regime (cf. Ahluwalia, 1996; Gulati, 1989; Gulati and Sharma, 1994). Sharma (2002) argues for a holistic reappraisal of existing agricultural extension systems and the need

to work towards an outlook that encompasses a whole new policy mix favouring a plurality of institutions. Behera and Mishra (2007) on the other hand examined how the major four factors-economical, ecological, technological and institutional-affect agriculture in the Indian context. It appears that neither of these factors is exogenous in nature. Instead, they are endogenously determined not only by one another but also by the policies of the government. The institutions determine even the policies endogenously. Resulting prices of the inputs are determined by the trade and subsidy related policies and the role of the institutions in the input markets. The absence of institutional control in the county over input market has not only increased prices of the inputs but also created uncertainty on their availability in the right quantity, in the right quality, at the right price and at the right time to small and marginal farmers.

Credit

The Indian Government decided in June 2004 to double the flow of agriculture credit in the following three years with reference to base year 2003-04. The flow of agriculture credit since 2003-04 has consistently exceeded the target and credit flow in agriculture which was Rs.86, 981 crore in 2003-04 reached to Rs. 468,291 crore in 2010-11. "The target for 2015-16 was Rs. 8,50,000 crore and achievement is Rs. 8,77,527 crore. The target for 2016-17 has been set at Rs. 9,00,000 crore and a sum of Rs. 755,995.17 crore has been disbursed as agriculture credit during April-September, 2016" (Department of Agriculture & Cooperation, 2016, p. 1). Satish (2007) has discussed the financial sector reforms after 1991 systematically undermined the institutional credit arrangements for agriculture in India. A clear and explicit reversal of the policy of social and developmental banking was the leitmotif of these reforms. However, the policy, especially since May 2004, has displayed some response to the concerns

about the insufficient flow of credit to agriculture. Agricultural credit has played a vital role in supporting farm production in India. Though the outreach and amount of agricultural credit have increased over the years but several weaknesses have crept in which have affected the viability and sustainability of these institutions. Drastic shifts in consumption pattern encourage changing crop patterns in India. A silent transformation is taking place in most of the backward rural areas calling for diversification in agricultural and value addition processes in order to protect employment and livelihood of the rural population. In the changed scenario, strong and viable agricultural financial institutions are needed to cater to the requirements of finance for building (Mohan, 2006). Dev (2002) suggested that in order to revive agricultural growth, measures such as increase in public and private investment, increase in the availability of rural credit, infrastructure such as irrigation, better marketing systems, improvements in agricultural research and technology, domestic and trade liberalization are needed. Also, we need to have cost reducing technology in order to have a viable agriculture to compete with other countries under the WTO regime.

Technological Change

Technology has played an important role in the development of the agricultural sector in India especially since the late 1960s. The introduction of Norman Borlaug (1914-2009) method helped enormously in increasing the productivity of agricultural crops, especially wheat and paddy, by enhancing land productivity in irrigated areas through an increased use of fertilizers and pesticides and other inputs. But this increase in crop productivity did not come without adverse environmental effects (Behera and Mishra, 2007). The new technology brought to the fore, the urgent need for removing imbalance in agriculture, namely between rainfed and irrigated areas, between crops (cereals and other) and

between large, medium and small farms (Mukhopadhyay, 1976). As a result, output particularly of cereals went up, mainly due to expansion cropped areas up to starting of Green Revolution in India and raised up yield thereafter with launching of the HYPP (Mellor,1976). Change in Indian agriculture, in the process of Green Revolution effected the use of a very different modern technology and its adoption and achievement on an unprecedented scale. It brought in its wake, a quantum jump in yield of cereals and proved big leap in direction of modernisation and more importantly it showed a way out to face the future with greater hope and confidence, proved many a Cassandra wrong about our capacity to feed our large and fast-growing population (Hopper, 1976).Shankar (2005) presented tentative attempt at understanding 40 years of development experience, focusing on inter-regional differences in the pattern of agricultural growth. Given the overwhelming importance of agriculture in the state economy, a breakthrough in rainfed dryland agriculture can be said to hold the key to development. The post-reform era has grown encouraged the change in cropping pattern rather than prevailing persistent pattern with rising input costs, dwindling produce price realisation and the inability of farmers to abandon cultivation without alternative livelihood sources. Before the economic reform input cost in cultivation and wholesale price index (WPI) of output moved in tandem to each other but later the gap become deeper. The weighted average of the costs of farm inputs: wages (including machine labours), chemical fertilizer and pesticides, irrigation changes, seed price, interest charges (on credit), etc. have been reported galloping in the post-reform period (Raghavan, 2008).

Production

The analyses, made by Bhalla (1995) and Bhall and Singh (2009), of the impact of economic reforms on the levels and growth of land yields and agricultural output at the state and regional levels have revealed notable results. The main components of agricultural output - area growth, yield growth and cropping pattern changes - are also analysed by them with a view to identify the chief sources of growth in each period. Sharma (1999) observed that in the late 1960s, the emphasis in India's development plan was on the on the removal of inequality mainly related to urban industrial development. The focus shifted to rural and agriculture development imbalances only after implementation of the High Yielding Varieties Programme (HYVP). Even after the HYVP the economists' regional interest was confined to the issues like input output analysis, component analysis, distribution of gain, employment potential, production function etc. (Heston, 1968). The major factors behind the persistence of rural poverty in developing countries can be traced to the low productivity of labour on small and marginal farms on accounts of a variety of reasons-lack of access to complementary inputs, insecurity of tenancy and dependence on the rural rich in a situation of asymmetric power relations and interlinked factor markets, all militate against achieving a high level of productivity on small and marginal farm (Mukherji and Mukhopadhyay, 1995). The record growth in food grain output in 2011-12 (twelfth five year plan) was a result of conductive weather, rising yields, technological gains, better prices, timely policy interventions and implementation of various schemes such as the "Bringing Green Revolution to the Eastern Region" of India in the Eleventh Plan. The analysis of production data at country level shows that there has been a significant overall turnaround in the agricultural situation since 2010-11 in both food as well as non-food crops. However, there has also been a shift in favour of non-food crops (Deokar, Pandey and Lokhande, 2013).

Social Change

The impact of land reform on Indian agriculture influenced the rural agrarian society and also the changing land and rural social relations at the dawn of land reforms. The social mobility is seen in three forms: mobility in farming sector, out of farming sector and mobility in raised real household's income through agrarian change. It is argued that not only farming but also non-farm activities play vital role to drive social mobility in rural area. Old agrarian social structures seem to be having centripetal tendency with a movement of agrarian change towards a strengthened position for family farming and for the underdogs in the old agrarian society to gradually leave agriculture altogether, seeking improved life chances in the non-agrarian economy in rural area (cf. Radhakrishnan, 1983; Gill, 1989; Göran Djurfeldt et al., 2008; Purushothaman and Patil, 2017). Though the Green Revolution gradually changed the face of Indian agriculture, the land reforms and economic reforms of 1990s affected rapidly the nature of Indian Agriculture. In terms of social groups, the most visible beneficiaries of this agricultural change were the substantial landowners from the locally dominant caste groups, who had traditionally been landowners and cultivators. The locally dominant castes consolidated their position in the regional and local power structure (Sharma, 1994; Jodhka, 2012). In a recent study made by Kumar (2016) agriculture and allied sector affecting rural non-farm economy; securing the livelihood, growing educational opportunities, and increasing mobility across castes and communities in Western Uttar Pradesh are mapped.

Integrating the Rural Economy

Agriculture is thus a very important source of employment and income, with implications for other sectors of the economy, in the developing country. Raising agricultural productivity is important for reducing poverty and promoting food security and nutritional well-being (The Wye Group Handbook, UN, 2007). In the last decade of 20th century rural development has been at the centre in the theory and practice of development. In the late 1960s there was wave optimism about food supply and prospect for agricultural development in the Third World countries, as a result of introduction of new high-yielding variety of major food grain, in the so-called green revolution (Harris, 1982). In 1970, the UN had proposed 'structural reform' an appropriate term in the place of land reform for reducing the rural poverty.

There are strong elements of both change and continuity in the policy regime affecting food and agriculture as well as in the structure of the rural economy. The significance of a higher budgetary allocation for agriculture cannot be assessed in isolation from trends in the rural economy and the reform regime put in place since 1991 both of which continue to elude consensus (Rao, 1998). The studies have shown that agriculture has been one of the important sources of rural development and it also helped in enhancing the household income and reducing livelihood insecurity. The changes that have taken place in the agrarian structure seem to have reduced the incidence of rural poverty only via agricultural development channel (Ghos, 1998; Alston et al., 2000). "Caught up in the euphoria of liberalisation, the new economic policy largely ignored the rural economy and its development. Fortunately, since 2000-01, there has been a new-found interest in resurrecting the agenda of rural development adopting a comprehensive and pragmatic approach" (Mujumdar, 2002). In rural areas small holders remain an attractive proposition for agricultural investment. Although many rural households have diverse livelihood portfolios in which agriculture plays a reduced role, the number of rural households who use farming as a platform for other livelihood strategies is actually increasing, while the

role of subsistence agriculture in providing a safety net for smallholders should not be ignored (Jakimow et al., 2013).

Conclusion

Rural development in India seems to hold the key to overall development of the economy, food security and improvement in the quality of life. Economic reforms of the 1990s created a favourable environment for agricultural growth and rural development. Economic liberalization played a vital role in changing market scenarios. It affected the rural agrarian society which was till now segregate from mainstream of development. Many problems exist in at present time but still, after the economic liberalisation, we find new better nature of agriculture sector in India.

Recent agricultural changes especially in terms of technology have provided the best results. With the liberal policies and credit system initiated by the government, farmers have shown positive changes in terms of output. After the economic liberalisation, we find a agriculture sector in India improving; however, a few problems still persist.

References

Agriculture Credit Overview, 2016, Department of Agriculture & Cooperation, Ministry of Agriculture & Farmers Welfare, New Delhi.

Ahluwalia, Montek S., 1996, New economic policy and agriculture: Some reflections. *Indian Journal of Agricultural Economics,* 51 (1): pp. 173-194.

Alston, J. M. et. Al, 2000, *A Meta-Analysis of Rates of Return to Agricultural R&D: Ex Pede Herculem,* Research Report 113, International Food Policy Research Institute, Washington DC.

Astha, A., 2006, *Agriculture and Rural Development in India: Post-liberalisation Initiatives,* New Century Publications, New Delhi.

Behera, B. and Mishra, P., 2007, Acceleration of agricultural growth in India: Suggestive policy framework. *Economic & Political Weekly,* 38(42): pp. 4268-4271.

Bhalla, G. S., and Singh, Gurmail, 2009, Economic liberalisation and Indian agriculture: A statewise analysis, Review of Agriculture. *Economic & Political Weekly,* 45 (52): pp. 34-44.

Bhalla, G. S., and Singh, Gurmail, 2012, *Economic Liberalisation and Indian Agriculture: A District-level Study.* SAGE Publication, New Delhi.

Bhalla, G.S.,1995, Globalization and agricultural policy in India, Presidential address. *Indian Journal of Agricultural Economics,* 50 (1): pp. 7-26.

Bradburn, N. M., 1969, *The Structure of Psychological Well-being.* Aldine, Chicago.

Chand, Ramesh, 2002, *Trade Liberalisation,* WTO and *Indian Agriculture:* Experience and *Prospects.* Mittal Publication, New Delhi.

Day, R.H. and Singh, Indrajit, 1977, *Economic Development as an Adaptive Process: The Green Revolution in the Indian Punjab.* Cambridge University Press, New York.

Deokar, B. K.,Pandey, S. J. &Lokhande, N. R., 2013, Trends in agricultural production. *Economic & Political Weekly,*48(39): pp. 83-85.

Dev, Mahendra S., 2002, Bold initiatives needed on agriculture and rural employment. *Economic & Political Weekly,* 37 (12): pp. 1081-1091.

Djurfeldt, Göran et al., 2008, Agrarian change and social mobility in Tamil Nadu. *Economic & Political Weekly,* 43(25): pp. 50-61.

Frankel, Francine, 1971, *India's Green Revolution: Economic Gains and Political Costs.* Princeton University Press, Princeton.

Ghosh, M., 1998, Agricultural development, Agrarian structure and rural poverty in West Bengal. *Economic & Political Weekly,* 33 (47): pp. 2987-2995.

Gill, Sucha Singh, 1989, Changing land relations in Punjab and implications for land reforms. *Economic & Political Weekly,* 24 (25): pp. 79-85.

Griffin, K., 1974, *The Political Economy of Agrarian Change.* Harvard University Press, Cambridge

Gulati, Ashok, 1989, Input subsidies in Indian agriculture - A state-wise analysis. *Economic and Political Weekly,* 24 (25):pp. 57-66.

Gulati, Ashok and Sharma, A., 1994, Agriculture under GATT: What it holds for India. *Economic and Political Weekly,* 24(29): pp. 1857-1863.

Harris, J., 1982, *Rural Development: Theories of Peasant Economy and Agrarian change,* Hutchinson & Co. Publishers, Ltd.

Heston, A., 1968, Variation in agriculture growth and output between and within regions of India. *Asian Survey,* University of California Press, 8 (3): pp. 174-187.

Hopper, W.D., 1976, Six Coromandel Lecture: A perspective on India's food. *Eastern Economist,* 30: pp. 78-93.

Jakimow, Tanya et al., 2013, A future orientation to agrarian livelihoods: A case study of rural Telangana. Review of Rural Affairs, *Economic & Political Weekly,* 48 (26) : pp. 129-138.

Jodhka, S.Surinder, 2012, Agrarian Changes in the times of (Neo-liberal) 'crises': Revisiting attached labour in Haryana. *Economic & Political Weekly,* 47 (26 & 27): pp. 5-13.

Mohan, R., 2006, agricultural credit in India: Status, issues and future agenda. *Economic & Political Weekly,* 39 (11):pp. 1013-1021.

Morgan, W. B. and Norton, R.J.C., 1971, *Agricultural Geography,* Methuen, London.

Mujumdar, N.A., 2002, Rural development: New perceptions. *Economic & Political Weekly,* 37(39): pp. 3983-3983.

Mukherji, B. and Mukhopadhyay, S., 1995, Impact of institutional change on productivity in a small-farm economy: Case of rural West Bengal. *Economic & Political Weekly,* 30 (34): pp. 2134-2137.

Mukhopaddhyay, K. Sudhin, 1976, *Sources of Variation in Agriculture Productivity,* The Macmillan Company of India Ltd., Delhi: pp. 72.

Overton, M., 1996, *Agricultural Revolution in England: the Transformation of the Agrarian Economy:* 1500-1850. Cambridge University Press, Cambridge (UK).

Pandey, Vikash N., 1994, Agrarian transformation and co-operatives: Continuity and change. *Economic & Political Weekly,* Vol. 29 (15): pp. 864-870.

Purushothaman, S. and Patil, S., 2017, Regional economies and small farmers in Karnataka. *Economic & Political Weekly,* 52 (46): pp. 78-84.

Radhakrishnan, P., 1983, Land reforms and social change study of a Kerala village, Review of Agriculture. *Economic & Political Weekly,* 18(52-53): pp. 143-150.

Raghavan, M., 2008, Changing pattern of input use and cost of cultivation, Review of Agriculture. *Economic & Political Weekly,* 43 (26 & 27): pp. 123-129.

Rao, Mohan J., 1998, Food, Agriculture and Reforms Change and Continuity. *Economic & Political Weekly,* Vol. 33 (29&30): pp. 2567-2575.

Satendra, Kumar, 2016, Agrarian transformation and the new rurality in Western Uttar Pradesh: Review of Rural Affair., *Economic & Political Weekly,* 51 (26-27): pp. 64-73.

Satish, P., 2007, Agricultural credit in the post-reform era: A target of systematic policy coarctation. *Economic & Political Weekly,* Vol. 43 (26 & 27): pp. 123-129.

Sen, B., 1974, *The Green Revolution in India.* Wiley Eastern Private Ltd., New York.

Shafi, M., 2006, *Agricultural Geography.* Pearson Education, New Delhi, India.

Shankar, P. S. Vijay, 2005, Four decades of agricultural development in MP: An agro-ecological sub-region approach. *Economic & Political Weekly,* 40(48): pp. 5014-5024.

Sharma, H. R., 1994, Distribution of landholdings in rural India, 1953-54 to 1981-82: Implications for land reforms. *Economic & Political Weekly,* 29(39): pp. 12-25.

Sharma, Rita, 2002, Reforms in agricultural extension new policy framework. *Economic & Political Weekly,* 37(30): pp. 3124-3131.

Sharma, T.C., 1999, *Technological Change in Indian Agriculture.* Rawat Publication, Jaipur/New Delhi..

Singh, J. and Dhillon, S.S., 2000, *Agriculture Geography.* Tata McGraw-Hill Publishing Ltd., New Delhi.

Smith, M. David, 1977, *Human Geography:* A Welfare Approach, Edward Arnold, London.

Swaminathan, M.S., 2009, Drought management of rural livelihood security, *The Hindu* (17 August 2009): pp. 12.

The Wye Group Handbook, 2007, *Rural Households' Livelihood* and Well-Being, Statistics on Rural Development and Agriculture Household Income. UN: New York and Geneva.

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Gaps in Spatial Planning of Water Resources Management for Metropolitan Areas: A Case Study of Chennai Metropolitan Area (CMA)

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Abstract

Urban wetlands such as ponds, lakes, canals, rivers are souls of an urban ecosystem. The explosive growth of urban population and consequent spatial expansion of human settlements have brought about fundamental changes to the physical landscape of urban environment and to the people's perception of land, water and other elements of an urban environment. The decline in the geographical size, physical, chemical and biotic properties of water bodies has affected urban ecosystems, biodiversity, aesthetics of the landscape and also household economies. The process of degradation of water bodies and its adverse effect on local communities is particularly visible in peri-urban belts where significant numbers of people are still engaged in water-dependent economic occupations. The present paper provides the gaps in spatial planning where water resources management has not been addressed properly for the metropolitan areas of Chennai city. The study was conducted on the water bodies of Tambaram taluk. Six water bodies of Tambaram taluk that are located in the urban-rural gradient have been studied in detail. The study design includes the collection and analysis of primary and secondary data. To identify the land use changes during the urbanization process, satellite imageries were used to classify the land use patterns during a span of three decades. Three sets of imageries acquired from 1987 to 2009 from Institute of Water Studies, Taramani (Chennai) were used in the analysis. The study suggests that the area allocated for residential and institutional spaces by Metropolitan Development Authority increased by 23.27% from 1971 to 2009, while areas allocated for water bodies has been almost negligible. The result shows that the area under water in the Urban Velachery Lake has reduced drastically by 80.5% followed by peri-urban lakes Rajakeelpakkam (69.8 %) and Pallikaranai (39.9%). In view of these facts, the study suggests that the water sector planning should precede the master planning process of any urban agglomeration.

Keywords : urban planning, land use changes, water bodies, resource management.

Introduction

Urban agglomerations are conceptualized as complex physical, ecological and social entities. They have especially contested and dynamic pattern of land use that is uneven distribution in terms of its spatiality and temporality. There-fore, spatial planning is critically important for a sustainable development of urban agglomerations (Thuo, 2008). Spatial planning plays a vital function in distribution and allocation of spaces for diverse activities considering the ecological,

social and economic values. However, the spatial element of urban coverage must be sensible in its choices with focus on preserving the ecological, economic and social fame of the urban agglomeration.

The rapid increase of urban population and consequent expansion of their spatial spans have brought about essential changes to their physical panorama and notion towards land, water and different elements of environment (Aguilar, 2008). The human-induced transformations in urban space has serious ramifications for the urban communities in terms of availability of ecologically healthy spaces (e.g., green spaces and water bodies), access to economically productive resources (i.e. agricultural lands and fisheries) and are vulnerable to environmental hazards and pollution. In parallel, urbanization processes generate hydrologic and water quality changes that notably effect and will hold to impact hydrological systems at the metropolis region (Jimenez, B.E.C., et al., 2014). These challenges are possibly to cause similarly social-economic and ecological implications and demand a reconsider in the way decision-making processes account for climatic change and promote resilient urban systems and inherent water resources that assist these systems (Zwolsman et al., 2010; Huntjens et al., 2012).

Hydrological and environmental connectivity at some point of a landscape can be supported by a system of interconnected green spaces and their inherent ecological (Kong et al., 2010), social (Flink, 2002), economic (Barthel, Sorlin, and Ljungkvist, 2010) and multifunctional benefits (Ashley et al., 2011). The water bodies such as ponds, lakes, wetlands canals and rivers are soul of an urban ecosystem. The wetlands function as cooling agents, habitats for biological community, and provide water for terrestrial animals. In an urban setting, ecosystem services from water source areas encompass provisioning services such as water for domestic and industrial uses, regulating services such as dilution of waste, and cultural services together with aesthetic, recreational, sense of place and identity associations (Cosman et al., 2012). These ecosystem services translate into benefits consisting of reduced water quality treatment costs and improved health, leading to an overall improvement of human well-being.

The public water managers face a variety of growing challenges. Two of the most serious challenges are long-term climate change and population growth and migration patterns (Howden et al., 2007). Population changes have prompted expanding urbanization and contamination, and have contributed to ecological damage, urban flooding, and water scarcity (Grimm et al., 2008; Sharma et al., 2010; Vorosmarty et al., 2010). In this regard, several studies provide accounts of relationships between worsening urban environment and growing human insecurity (Homer-Dixon, 1994; Krass, 2003; Alam, 2017). The growing economic disparity, poverty, over centralization and gradual but perceptible degradation of environmental resources in an urban setup pose a major challenge to the society (Chattopadhyay and Aniyan, 2000).

Studies on Chinese cities clearly indicate that there is increasing pressure on water bodies due to urban sprawl resulting in several negative consequences. A study at Beijing city shows that wetlands (reservoirs, lakes, rivers) form "urban cooling islands" and therefore their location and size have significant impact on surrounding thermal environments (Rahnao, et al, 2012). The situation is not much different in South Asian states of India and Bangladesh. A study from Indian city of Varanasi shows that the population growth and expansion of city have wiped out a number of ponds and water bodies and rendered functionally useless (Pal, Neelam, 2015). A study on Dhaka city found about 3 degree Celsius temperature difference between two areas of the city. Temperature was higher

in areas of high concretization and less wetland, and less in areas of more vegetation of trees with good water bodies. The ponds and natural canals declined much in Dhaka city due to urbanization and encroachment. These studies clearly underline the critical need of incorporating role of surface water bodies in the spatial planning of urban agglomerations (Hossain, et al., 2014).

The Sustainable Development Goals (SDGs) of 6 and 15 are especially applicable to water source areas because they encompass explicit commitments to the protection and recuperation of water-associated ecosystems and their services (Griggs et al., 2013). Global Aichi targets set by the Convention on Biological Diversity (CBD) also provide a good policy opportunity for strategic water source areas. These targets try to conserve ecosystems which can be of specific importance for biodiversity and ecosystem services, via protected areas and other effective area-based conservation measures (CBD, 2010). Even though strategic water source areas had been identified at a global level (Viviroli et al., 2007), application to national planning and decision making requires for improving the spatial resolution of the global map and adding country-wide detail on water transfer schemes, access and use. The latter is specifically important for arid and semi-arid countries, where inter-basin transfers are frequent, and accordingly water resources are used by more than just the lowland population of the surrounding basin.

However, despite inherent ecological and socio-economic values of water bodies, there is lack of well-structured surface water protection and development policies. Water bodies in almost all urban spaces of India are facing serious problems of encroachment, pollution and siltation. As many communities, such as farmers, fishermen, livestock herders, washer men, clay pot makers are directly dependent on such water bodies, any decline in their qualities and quantities invariably affect them adversely. The process of degradation of water bodies and its adverse effect on local communities is particularly visible in peri-urban belts where significant numbers of people are still engaged in water-dependent economic occupations. This paper aims to identify gaps in spatial planning of water resources management for metropolitan areas of Chennai city.

The Census of India, 2011 show that about 32 per cent of India's population lives in urban areas as compared to only 15 per cent in 1961. However, the pattern of urbanization is highly skewed in favour of metropolitan cities at the cost of small and medium towns and cities which are showing stagnation or extremely slow growth (CMDA, 2010). A panoramic overview of the present urban milieu shows that 300 towns with a population of above 100,000 inhabitants represent 65 per cent of the urban population, the remaining 35 per cent are spread over 3396 smaller towns (Census of India, 2011).

Indian cities are experiencing rapid growth and continuous spatial expansion in recent decades, resulting in tremendous and sustained pressure on land resources, water bodies and greens spaces inside their municipal boundaries as well as along the peri-urban belts. Across geographies, the rapid growth of urban population has resulted in overcrowding, congestion, insufficient infrastructure, inadequate service provisioning mainly in terms of drinking water, sanitation, energy, transport, solid waste management, environmental degradation and pollution, etc. of Indian cities. These, along with the poor management and improper planning to handle rapid growth, affect the socio-economic development of the country (Alam et al., 2011; Mustard and Fisher, 2004)

The metro cities in India needs a comprehensive and integrated spatial planning, that emphasizes all sectors of developmental activi-

ties. In India, Master Plans or the Comprehensive Development Plans definitions of land use and zoning are widely used for the spatial planning of cities. The Master Plan is a legal document that describes, in narrative and with maps, an overall development concept including both present property uses as well as future land development plans (MUD, 2015). In India, a plethora of studies pertaining to urban land use are available. However, studies on the spatial planning approach of urban centers by specially focusing on their water bodies are lacking. This paper attempts to explain the spatial planning and the master plans of Chennai metropolitan area, its importance and lacuna in the planning of water resources during the preparation of master plans and limitations in the implementation of the same.

Study area

Chennai city is undergoing rapid urbanization and the urban sprawl is more towards the southern parts of Chennai i.e. in "Tambaram" taluk of Kancheepuram district. Tambaram taluk has substantial number of lakes/water bodies (Table 1) and serves for various uses and hence chosen for the study. The northeast monsoon, occurring during the month of October- December, contributes substantial amount of rain fall to the district. The average annual rainfall of the district is 1200 mm (Seenivasan, 2002).

The study area comes under the Adayar sub-basin. The major geographical boundaries of the study area are coastal line on the east, CMA boundary on south and west and Adayar river on the north. The study was conducted on the water bodies of Tambaram taluk. Six water bodies of Tambaram taluk that are located in the urban-rural gradient are studied in detail. These are Velachery (Urban), Keelkattalai, Pallikaranai and Rajakeelpakkam (Peri urban) and Vengaivasal and Agaramthen (Rural). These lakes come under the control of Public Works

Table 1: Taluk wise distributions of lakes in CMA

Name of the Taluk	No. of water bodies
Chennai City	9
Tambaram	45
Ambattur	20
Ponnamalle	14
Ponneri	5
Sriprembudur	3
Total	96

Source: Remyalakshmi, A.U., 2006

Department (PWD). Each of these lakes has a command area of over 100 acres.

Data sources and methodology

The study design includes the collection and analysis of primary and secondary data. To identify the land use changes during the urbanization process, satellite imageries were used to classify the land use patterns during a span of three decades. Three sets of imageries acquired from 1987 to 2009 from Institute of Water Studies, Chennai were used in the analysis. These are Landsat Imagery for the year 1987, IRS IC, LISS III imagery for 1997 and IRS P6 imagery for 2009. Digital image classification and interpretation was done using ArcGIS software and change in land use scenario during the three decades were mapped and quantified. The data on the land use planning and allocation of land for various sectors during the periods of 1971, 2006 and projected land use plan for 2026 were obtained from the CMDA, Government of Tamil Nadu and compared the same with the land use changes from the observed data.

Results and discussion
Analysis of land use changes

The land use changes of the study area are shown in Fig 1. The total extent of the study area is 316.6 sq.km. During 1987, the built-up

area was 60.3 sq.km; crop land was 73.2 sq.km and water bodies existed over 24.8 sq.km. The 1997 data shows that the built up area increased to 89.6 sq. km. crop land reduced to 60.9 sq. km. and water bodies came down to 16.9 sq. km. (Table 2). While in the 2009, the built up area spurred to 173.52 sq. km. crop land further down to 38.62 sq. km. and the water bodies are diminished to 12.95 sq.km.

The land use change analysis shows that the built up area has increased by 48.59 % from 1987 to 1997 and by 93 % from 1997 to 2009. The agricultural land has decreased by 16.60 % and 36.58 % and the water bodies by 31.85 % and -23.37 % from 1987 to -1997 to -2009 (Table 2). This clearly shows that the area under water body is declining, while the built up area is increasing multifold.

Figure 1: Land use analysis for the period 1987, 1997 and 2009

Table 2: Land use change the during 1987, 1997 and 2009

Sl. No.	Land use category	Land use area in sq.km and Land use change					
		1987	1997	2009	Decadal Change in % (87-97)	Decadal Change in % (97-09)	Decadal Change in % (87-09)
1	Built up land	60.3	89.6	173.52	48.59%	93.66	187.76
2	Agricultural land	73.2	60.9	38.62	-16.60	-36.58	-47.24
3	Forest Land	18.3	16.6	14.9	-9.29	-10.24	-18.58
4	Waste land	130.1	122.9	66.82	-5.53	-45.63	-48.64
5	Water bodies	24.8	16.9	12.95	-31.85	-23.37	-47.78
6	Others	9.7	9.7	9.8	0	1.03	1.03
	Total area		316.6				

Sources: Computed from Landsat Imagery of 1987, IRS IC, LISS III imagery of 1997 and IRS P6 imagery of 2009

Reduction of water bodies

Estimation of water spread area was done using three sets of satellite imageries (taken in 1987, 1997 and 2009) covering a period of 22 years (Table 3). The water spread area in the Velachery Lake has been reduced drastically by 80.5 %, which is now occupied by the residential and industrial complexes.

The Keelkattalai Lake had a water spread area of about 24.2 hectare and was used for irrigation, fishing and domestic needs. The irrigated area of the Lake is now completely converted into residential plots. Though the encroachment in the lake is limited to 0.5 ha, the formation of road from Pallavaram to Thoraipakkam has divided the lake into two halves. This provided scope for dumping of solid waste from either side of the road and unauthorized discharge of the industrial effluents into the Lakes. Pallikaranai Lake had a water spread area of 30.8 ha. The irrigated area served by the Lake is now completely converted into residential zone. The Lake area has also been encroached with settlements of migrant people. This reduced the lake water spread area to 18.5 ha, a loss of 39.9%.

The Rajakilpakkam Lake had a water spread area of 24.5 hectares. Development of roads near the lake has increased scope for more developments of the region. The command area
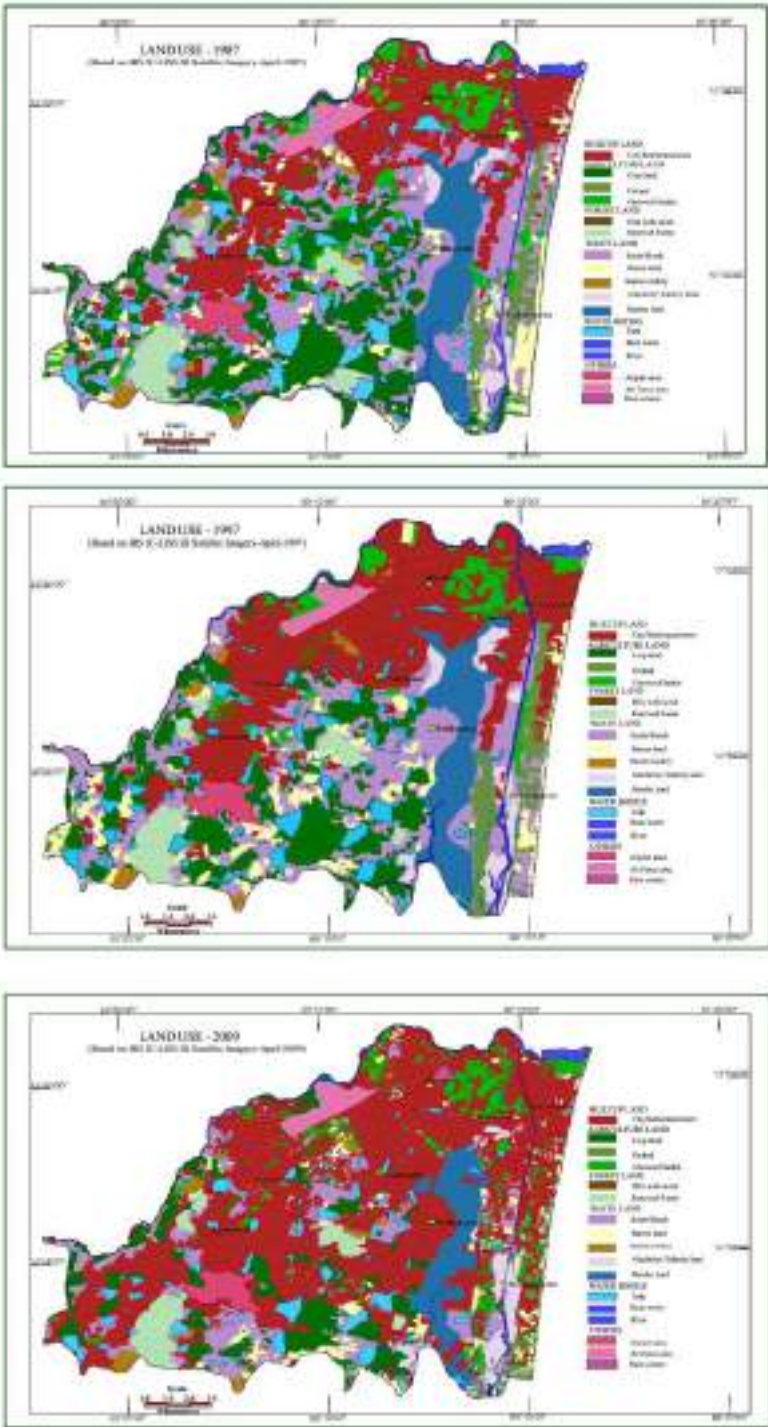
Figure 1: Land use analysis for the period 1987, 1997 and 2009

is now fully converted into human settlements. The lake area also got encroached and the bund of the lake is now fully occupied by migrants. This has resulted in the reduction of lake area to 7.9 ha by 2009, indicating a loss of 67.8 %. The Vengaivasal Lake had a water spread area of about 37.4 ha. This lake is used mainly for irrigation now, but a part of the command area

Table 3: Reduction of water bodies in three decades of 1987, 1997 and 2009

S.		Water Spread Area in ha			Reduction (%)			
No	Lakes	1987	1997	2009	87-97	97-09	Total	Present area (%)
1	Velachery	89.9	24	17.5	73.3	7.2	80.5	19.5
2	Keelkattalai	24.2	22.2	20.5	8.3	7.0	15.3	84.7
3	Pallikaranai	30.8	25	18.5	18.8	21.1	39.9	60.1
4	Rajakilpakkam	24.5	16.7	7.9	31.8	35.9	67.8	32.2
5	Vengaivasal	37.4	36.6	34.4	2.1	5.9	8.0	92.0
6	Agaramthen	70.9	69.8	61.8	1.6	11.3	12.8	87.2

Sources: Computed from Landsat Imagery of 1987, IRS IC, LISS III imagery of 1997 and IRS P6 imagery of 2009

is converted into residential plots. The encroachments in this lake amount to only about 1.62 ha (5%). The Agaramthen Lake had a water spread area of 70.9 ha in 1987 which reduced to 61.8 ha during 2009, a decline of 13 %.

In the Velachery Lake, 73.3% of the loss in water spread area had occurred before 1997 itself, and the remaining 7.2% took place between 1997 and 2009. In the peri-urban lakes, about half of the total loss (between 47 to 54%) occurred before 1997 and the rest after that. Interestingly, in the case of rural lakes 5.9% to 11.3% of the loss occurred after 1997. This pattern corresponds with the location of the six study lakes on the urban-rural gradient and the time lag in their susceptibility to the forces of urbanization process.

Water potential in CMA

The potential for storage and supply of water from surface water bodies for domestic use in CMA is significant. The surface runoff from the CMA was assessed to be 283.16 mm3 on the basis of the normal rainfall over the area. The average storage capacity of the lakes in CMA is roughly 42.47 mm3. Thus, the storage capacity of all the lakes in CMA accounts only for 15 % of the total surface run off. This indicates that 85 % of surface run off from CMA is at present going to the sea. There is a great potential to save some of this water by developing/deepening the existing water bodies and protecting them from encroachment and pollution. Today, huge amount of money is being spent for water in various sectors. This includes taking water from other states as well. But, neglecting these available water resources is really a great loss and there is an urgent need to improve these conditions and safeguard the water bodies for future use.

Land use planning of CMDA

A perusal on the document of master plan prepared for Chennai Metropolitan Area for the period of 1991, 2006 and 2026 indicates that the importance given for the water bodies, water

supply and drainage considerations is meager. The term "water bodies" have been thrown into "Others" category from 2006, which also includes forest, hills, vacant lands etc. The implication of not providing a separate category for water bodies in spatial planning process is complex and poses a major threat to the urban water resources, as the present study has already shown.

The spatial allocation given by Metropolitan Development Authority during 1971 (Table 4) showed 48.91 % space for agriculture, 30.98 % for residential, 4.74 % for institutions and 8.11 % for water bodies. During 2006, the spaces for residential (54.25 %) and institutions (18.48 %) have increased drastically. There is no mention of spaces covered by water bodies. The same is the case in the proposed Master Plan of 2026.

It is very crucial to understand the patterns of existing and future proposals on land use distribution in CMA. The occurrence of flood disaster during the monsoon seasons in Chennai must be correlated with the spatial allocation of water bodies in particular. The master plan during 2006 and the land use study during 2009 in the present study and proposed master plan for 2026 clearly shows the insignificant weightage for the spatial allocation of water bodies. The

Table 4: Land use distribution (%) of CMA of 1971, 2006 and proposed Master Plan, 2026

S. No	Category	1971	2006	2026
1	Commercial	0.86	7.09	4.05
2	Institutional	4.74	18.48	16.28
3	Residential	30.98	54.25	47.36
4	Industrial	6.11	5.17	4.67
5	Agriculture	48.91	0.57	0
6	Water bodies	8.11	-	-
7	Non-urban	-	0.47	0.64
8	Open space and recreation	-	2.09	5.68
9	Others	-	11.89	21.31

Source: CMDA, 2010

distribution of space for water storing structures needs to be in complementary with the other developmental land uses categories for the benefit of future.

Conclusion

Water bodies are important natural resources that maintain the ecological balance, provide valuable services to flora and fauna, cool the environment, recharge the groundwater, balance urban hydrology, etc. in both urban and peri-urban setting. In addition, they act as flood moderators, which is very essential for urban areas. Also, these water bodies can serve the urban areas as drinking water sources and recreation centers, if preserved properly. Besides, they are of tremendous social and economic values for the local people.

The pattern of land use in the study area has changed significantly. Residential use went up to 88% with dense multi-storied buildings in urban area while it was upto 72% in peri-urban villages. The scrub lands or waste lands were

mostly converted into residential areas, and to a very lesser extent from other categories. Rajakilpakkam village leads all the other villages in terms of changes noticed due to urbanization process. Agricultural land area has rapidly declined here. The spaces for residential and institutional use have increased from 1971 to 2009. In the spatial planning documents of Chennai, there is no mention of spaces covered by water bodies. In other words, there is no separate category of land use denoting water bodies. The same is the case in the proposed Master Plan of 2026. This clearly reflects constricted conception about spatial planning of metropolitan centres prevailing among city planners. In view of these, the study suggests that water sector planning should be an integral component of master planning process of metropolitan planning process without which the idea of sustainable urban development will remain a distant dream only.

References

Aguilar, A., 2008, Peri-urbanization, illegal settlements and environmental impact in Mexico City, *Cities,* 25 (3): pp. 133-145.

Alam, I., et al., 2011, Towns of Murshidabad District: Study of Perception on Urban Infrastructure, *Practishing Geographer,* 15 (1): pp. 265-280.

Alam, Sarfaraz, 2017, Governing Cross-border Ecology, Hazards and Population Movement: Narratives and Counter Narratives from Bangladesh, In Miller, Michelle Ann, Douglass, Michael and Garschagen, Matthias, (eds.), *Crossing Borders: Governing Environmental Disasters in a Global urban Age in Asia and the Pacific,* Springer, Singapore, pp. 219-242.

Ashley, R., et al., 2011, *Surface water management and urban green infrastructure: A review of the potential benefits and UK and international practices,* Foundation for Water Research, Marlow, Buckinghamshire, United Kingdom.

Barthel, S., Sörlin, S., Ljungkvist, J., 2010, Innovative memory and resilient cities: Echoes from ancient Constantinople. African and Comparative Archaeology: Department of Archaeology and Ancient History, Uppsala University.

CBD, 2010, COP 10 - Tenth Meeting of the Conference of the Parties to the Convention on B i o - logical Diversity, Nagoya, Japan 18-29 October 2010, *Decision X/2 Strategic Plan for Biodiversity* 2011-2020 and the *Aichi Biodiversity Targets,* United Nations Environment Programme; available on http:// www.cbd.int/sp/targets/; accessed on November 10, 2016.

Chattopadhyay, S. and Aniyan, P.V., 2000, Spatial Planning: Scope of Kerala's Experiment in People's Campaign for Decentralized Planning, *International Conference on Democratic Decentralization,* Thiruvananthapuram, Kerala, India.

CMDA, 2010, *Draft Master Plan II for Chennai Metropolitan Area,* 2026, Chennai Metropolitan Development Authority, Chennai.

Cosman, D., et al., 2011, How water utilities can spearhead natural capital accounting? *Solutions,* 2 (6): pp. 28-31; available on https:// www.thesolutionsjournal.com/article/how-water-utilities-can-spearhead- natural-capital-accounting/; accessed on November 11, 2018.

Flink, C., 2002, Greenways as green infrastructure in the new millennium, *Handbook of water sensitive planning and design,* Boca Raton, FL: Lewis Publishers: pp. 395-405.

Griggs, D., et al., 2013, Policy: sustainable development goals for people and planet, *Nature,* 495 (7441): pp. 305-307.

Grimm, N.B., et al., 2008, Global change and the ecology of cities, *Science,* 319 (5864): pp. 756-760.

Homer-Dixon, Thomas F., 1994, Environmental Scarcities and Violent Conflict: Evidence from Cases, *International Security,* 19 (1): 5-40.

Hossain, Mohiuddin, et al., 2014, An analysis of the temperature change of Dhaka city, Proceedings of 5th International Conference on *Environmental Aspects of Bangladesh,* pp. 46 - 48.

Howden, S.M., et al., 2007, Adapting agriculture to climate change, *Proceedings National Academy of Science,* 104 (50): pp. 19691-19696.

Huntjens, P., et al., 2012, Institutional designs propositions for the governance of adaptation to climate change in the water sector, *Global Environmental Change,* 22: pp. 67-81.

Jimenez, B.E.C., et al., 2014, Freshwater resources, In Field, C.B., et al., (eds.) Climate change 2014: impacts, adaptation, and vulnerability, *Part A: global and sectoral aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change,* Cambridge: Cambridge University Press, 229-269; available on: http://ipcc-wg2.gov/AR5/; accessed 22 November 2015.

Kong, F., et al., 2010, Urban green space network development for biodiversity conservation: Identification based on graph theory and gravity modeling, *Landscape and Urban Planning,* 95: pp. 16-27.

Krass, F., 2008, Megacities as Global Risk Areas, In Marzluff J.M., et al. (eds.), *Urban Ecology: An International Perspective on the Interaction between Humans and Nature,* USA, Springer: pp. 283-296.

Ministry of Urban Development (MUD), 2015, *Urban and Regional Development Plans Formulation & Implementation (URDPFI) Guidelines, Volume 1,* Government of India, New Delhi.

Mustard, J.F., Fisher, T.R., 2004, *Land use and hydrology, In Gutman, J., et al. (eds.): Land Change Science: Observing, Monitoring and Understanding Trajectories of Change on the Earth's Surface,* Kluwer Academic Publications, Dordrecht, The Netherlands: pp. 257-276.

Pal, Neelam, 2015, Recent Population Changes and Development Strategies in Varanasi city: a geo-graphical study New Delhi: *ABST Publications,* New Delhi.

Rahnama, M.R., et al., (2012): Strategic Review of Financial Structure of Iran's Local Management (Case study: Islamic Council of Tehran Metropolis), *International Journal of Applied Science and Technology,* 2 (3): pp. 150-164.

Remyalakshmi, A.U., 2006, *Strategy for Restraining Conversion of Lakes in CMA,* Master's Thesis (Planning), School of Architecture and Planning, Anna University, Chennai.

Seenivasan, R., 2002, Village Lakes of India, *Proceedings of the regional workshop Madurai,* India: pp. 1-19.

Sharma, A., et al., 2010, Role of decentralised systems in the transition of urban water systems, *Water Science and Technology: Water Supply,* 10 (4): pp. 577-583.

Thuo, A.D.M., 2008, Book Review: Tradition, culture and development in Africa: Historical lessons for modern development planning (Author: Ambe J. Njoh), *Urban Policy and Research,* 26 (1): pp. 125-139.

Viviroli, D., et al., 2007, Mountains of the world, water towers for humanity: typology, mapping, and global significance, *Water Resources Research,* 43 (7): pp. 1-13.

Vorosmarty, C.J., et al., 2010, Global threats to human water security and river biodiversity, *Nature,* 467 (7315): pp. 555-561.

Zwolsman, G., et al., 2010, Climate changes and the water industry - Practical responses and actions, *Perspectives on water and climate change adaptation series,* The Hague, Netherlands: Paper prepared by the International Water Association (IWA) Specialist Group on Climate Change (CCSG), on behalf of the IWA, International Water Association.

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An Appraisal of Regional Development in Eastern Uttar Pradesh

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Abstract

Regional development refers to the understanding of development in the sense of economic efficiency, inequality, disparities and environmental management in a geographic area. In the past, regional development policy tended to try to achieve these objectives by means of large-scale infrastructure development and by attracting inward investment. Past policies have failed to reduce regional disparities significantly and have not been able to help individual lagging regions to catch up, despite the allocation of significant public funding. The result is under-used economic potential and weakened social cohesion. Eastern Uttar Pradesh is presenting the real pictured of these types of inequality, disparity and poverty since last of 70 years of our independence. It is an economically backward region because of lack of infrastructure and huge population. The development has been assessed with the help of composite index based on twenty indicators (social, economic, health, education and population characteristics etc.). High level disparities have been observed among the districts of the study area. It requires favourable regional policies to remove the backwardness which are differently able, because of Saryupar plain is rich in agricultural activities where as plateau region have some minerals. Spatial variation in regional development has been assessed in this paper.

Key Words: regional backwardness, regional development, regional planning, composite index, levels of development

Introduction

The process of development in the backward regions should be upgraded while maintaining the progress of those areas which are relatively more developed (Shafi, 1984). Development is the process of improving the quality of all human lives and capabilities by raising people's levels of living, self-esteem, and freedom (Todaro and Smith, 2012), it means is not only growth of any things, but, it differ from growth (Syrous and Laura, 2007) while regional development refers to the understanding of development in the sense of economic efficiency, inequality, disparities and environmental management in a geographic area (Sharma, 1998 and Binns, 1995). India after political freedom, have adopted planning process for the development. Regional planning in India is an important instrument of achieving the nation's main aim and objectives. The central objective of planning is to raise the standard of living of the people and to open out of them opportunities for a richer and more varied life. It must, therefore, aim both at utilizing more effectively the available resources- human and materials- so as to obtain

from them a larger output of goods and services and also at reducing the basic goal of Indian planning opportunity (Government of India, 1951). In the past, regional development policy tended to try to achieve these objectives by means of large-scale infrastructure development and by attracting inward investment. Past policies have failed to reduce regional disparities significantly and have not been able to help individual lagging regions to catch up, despite the allocation of significant public funding. The result is under-used economic potential and weakened social cohesion (OECD, 2016).

India initiated planning for national economic development with the establishment of the Planning Commission in 1951 and, till now the major principles of the plans are the growth, employment, self-sufficiency and social justice. The aim of the First Five Year Plan (1951-56) was to raise domestic savings for growth and to help the economy resurrect itself from colonial rule. The real break with the past in planning came with the Second Five Year Plan (Nehru-Mahalanobis Plan) in which, industrialization strategy articulated by Professor Mahalanobis placed emphasis on the development of heavy industries and envisaged a dominant role for the public sector in the economy and the entrepreneurial role of the state was evoked to develop the industrial sector especially public sector. In this plan, government announced the industrial policy in 1956, with the objective of high growth rate, self-reliance, reduction of foreign dominance, building up of indigenous capacity, encouraging small scale industry, bringing about balanced regional development, prevention of concentration of economic power, reduction of income inequalities and control of economy by the state. The planners and policy makers suggested the need for using a wide variety of instruments like, high investment and licensing to push industrial development. The strategy underlying the first three plans assumed that once

the growth process gets established, the institutional changes would ensure that benefits of growth trickle down to the poor. But doubts were raised in the early seventies about the effectiveness of the 'trickle down' approach and its ability to banish poverty. There was unchecked population growth in this period. Though the growth achieved in the first four Five Year Plans was not sufficient to meet the aims and objectives of development.

The Fifth Plan (1974-79) was introduced at the time when country was reeling under a veritable economic crisis arising out of run-away inflation. But, Indian planners were concerned with the slogans "Garibi Hatao" (removal of poverty) and the "growth with Social justice" (Datt and Mahajan, 2011). There were a two sixth plans, old sixth five year plan (1978-83) openly praised the achievements of economic development in terms of modernization and self-reliance but, after few year, new sixth five year plan prepared by new elected Congress Government for the period of 1980-85 and they brought Nehru model of development with aim 'direct hit on poverty' which was not sufficient for backward areas, like, eastern Uttar Pradesh. Hence, the roots of the liberalization program were started in the late 80's when Rajiv Gandhi was the Prime Minister of India, but the reach and force of the reform program was rather limited. There were political reasons as to why this program could not be enhanced which we talk about later. But, seventh five year plan (1985-90) which sought to policies would accelerate the growth in food-grains production, generating employment opportunities and raise productivity of many crops. Same as above fifth plan; eighth plan was not fruitful for the poor people because country faced the problems of a severe economic crisis, a rising debt caused by a balanced payment crisis, mounting inflation and recession in industrial sector. However, just before, this plan, government adopted the policy

of liberalization and globalization and they reflected some relaxation to Indian economy while the Ninth Five Year Plan was focused on 'Growth with social justice' which may be fruitful for people of backward areas but, due to unawareness, it was not happened. This plan targeted GDP growth rate of 6.7 but failed to achieve it.

Tenth Five-Year Plan (2002-07) aimed to good governance and implementation, suitable environment to internal trade, investor-friendly climate and solve the problems faced in transferring functions and resources to the Panchayati raj institutions. Main Targets of this plan was 7.92 per cent growth rate of GDP (with 3.97 per cent of agriculture and allied sectors and 9.82 per cent of manufacturing sector), creating of 50 million jobs, literacy rate to increase to 75 per cent, cent reduction of poverty 26 per, doubling of per-capita income within 10 years, from the present and potable drinking water in all villages etc. Like all other Five Year Plans, the 10th Five Year Plan is also devised, executed and supervised by the Planning Commission of India and its good effects on backward areas. The vision of eleventh plan (2007-12) was rapid growth that reduced poverty and creates employment, special attention of health, education, skill development, reduce gender inequality, good governance, environmental sustainability and extension of employment opportunities using MNAREGA programme. Thus, this plan was a very ambitious plan but, unfortunately, not success as planner's dream. However, programmes of this plan were proved very advantageous for rural landless households and labourers and make some control of migration from rural to urban area. Twelfth five year plan (2012-17) is going on with high speed of infrastructural development which will be help in to high economic development. Many new schemes and programmes are launched by new government both for urban and rural areas for the multidimensional development.

The economic and demographic dynamics of regions are highly differentiated both within and across countries (Veneri and Ruiz, 2013). India is a federal democratic state with a mixed economy. The objective of India's development strategy has been to establish a socialistic pattern of society through economic growth with self-reliance, social justice and alleviation of poverty. These objectives were to be achieved within a democratic political framework using the mechanism of a mixed economy where both public and private sectors co-exist. But, this socialistic pattern of economic development has not achieved the targeting level of development. Therefore, this system of planning has frustrated the very norms of socialism (Singh, 1991). Undoubtedly, results revealed a determined will to work out an integrated programme to ensure the supply of essential needs to people and to develop the basic infrastructure for strengthen the country's economy and sustain its continuous growth and, the Indian economy has been propelled by the liberalization policies that have been helpful in boosting the trade dimensions. Therefore, the biggest boon to the economy has come in the shape of outsourcing. Its well English trended population has been involved in making India a favorite destination for information technology or business process outsourcing. Moreover, some part of the country has been untouchable of these specialized services. Eastern part of Uttar Pradesh is one of them. This work is an attempt to find out the disparities and estimate the level of regional development in this region.

The study area

Eastern Uttar Pradesh (23 51 N to 28 31 N latitudes & 81 30 E to 84 39 E longitudes) is a backward region, includes Gorakhpur, Basti, Azamgarh, Mirzapur, Faizabad (except Barabanki district), Varanasi, Allahabad (except Fatehpur district) and Devipatan division of Uttar Pradesh (Figure 1). It covers an area of

85298.79 km² (29.10 per cent of the state). The industrial development has been on certain locations, like, Sonbhadra (mineral based), Sant Ravidas Nagar Bhadohi (carpet industry), Allahabad (technology based) and Kushinagar (sugar industry). The spread-effect is lacking due to less development of infrastructures, almost localized resources base and lacking capital accumulation (Sharma, 1998). State government had also been launched the several policies and programmes for the development of the state on time to time, like, industrial promotion and policies, 2012 which provided many exhaustible facilities to small and large entrepreneurs and 'Sugar Industry, Co-generation and Distillery Promotion Policy, 2013, which have many advanced schemes for sugar industry promotion to establish the new factories and restart the closed sugar factories. In eastern Uttar Pradesh, some mills can be restarted because it will be more economic than new establishment, i.e., U.P. State Sugar Corporation Ltd., Baitalpur (Deoria), Kisan Sahkari Chini Mills Ltd., Sathiaon (Azamgarh), Nandganj Sihori Kisan Sahkari Chini Mills Ltd., Nandganj (Ghazipur) and The Kasipur Sahkari Chini Mills Ltd., Aurai, Sant Ravidas Nagar, Bhadohi (Tiwari, 2014), in which government established a mill in Azamgarh district of the place of Kisan Sahkari Chini Mills Ltd., Sathiaon in 2015. Government provides single window system for entrepreneurs under one roof with the help of 'Udhyog Bandhu' and provided types of subsidies to farmer for agricultural activities and to entrepreneurs for industrial development which helps to economic development of this backward region because it is an agricultural rich region. Therefore, it is highly needed to frame regional policy for the development of natural resources, development of agricultural and industrial activities in such a way they may provide energy, employment and resources for the large population in future and also to raise and improve the living standard of the people in general (Sharma, 1984, 1991 and 1994). The polity in the state provided dynamic leadership in the country yet is was deprived of the benefits of the dynamism. There has hardly been any effort to think in terms of regional development, much less for the entire state or formulating 'Commission for Regional Policy' (Sharma, 1998).

Data sources and methodology

Development is a multi-dimensional process (Krugman, 1995) and, therefore, a composite index of development, based on many development indicators, has been worked out for the study. The districts have been taken as units of analysis. The value of composite indices is used to represent the levels of development of the study area. In this study, the levels of regional development in different districts are delineated on the basis of 20 indicators (Table- 1 & 2). Though by no means, this list is comprehensive. The composite index for delineation is calculated from weighted value of each indicator with the help of the following formula (Sharma 2004, 2006 and Tiwari & Sharma 2011, 2014).

WV= N/M x 100

Where, WV- Weighted value of numbers in the series of indicator, M- Maximum number in the series and N- Number in the series to be weighted

Weighted value is calculated giving 100 as a weight to the maximum number of the series. Every number of the each series is revaluated in the reference to 100 and thus, revalued number is the real rational value of the series. Composite index is the weighted value of the sum of revalued numbers. On the basis of composite index, Eastern Uttar Pradesh has been delineated in three categories: (a) high developed region (b) moderate developed (c) low developed region (Table- 2). This study is mainly based on secondary data gathered from different sources.

Results and discussion

Indicators of Regional Development

There are 20 indicators used to measure the levels of regional development in eastern Uttar Pradesh. Each indicator has relative weighted value and is able to present the graph of development, which are discussed below-

A. Percentage of Irrigated Area to Net Sown Area: Eastern Uttar Pradesh had 76.25 percent irrigated are to total net sown area. Some district had high irrigated area and some were very poor condition due to disparities in the development of irrigation facilities or natural availability of water. Ambedkarnagar district had highest net sown area under irrigation (94.42 per cent) with highest weighted value (Table- 1) and Sonbhadra district was the least developed 21.03 per cent area under irrigation.

B. Percentage of Energy used in Agriculture Sector: Out of total energy used in the study area, 23.16 percent used in agricultural activities. Ambedkarnagar district used 71.20 per cent energy in agricultural sector with highest weighted value (Table- 1) followed by Bahraich, Kaushambi, Ghazipur, Shrawasti and Balrampur while Mahrajganj district used only 6.05 per cent energy in this sector.

C. Percentage of Energy used in Industrial Sector: Out of total energy used in the study area, 19.7 percent used in industrial activities which were just opposite of agricultural sector. Sonbhadra district used 65.15 per cent energy in this sector with highest weighted value (Table- 1) whereas Shrawasti district used only 2.97 per cent energy in industrial sector.

D. No. of Industrial Units per Lakh Population: In the study area, 60.08 industrial units were found on per lakh population. Bahraich district had highest number of industrial units per lakh population (104.71 units) with highest weighted value (Table- 1) followed by Sultanpur, Pratapgarh, Gonda, Mahrajganj, Faizabad and Deoria. Chandauli district had the lowest industrial unit per lakh population (12.14 units) with weighted value of 11.591. Districts had highest number of industrial units, basically had the small scale agro-based industries.

E. Per-Capita Investment in Industrial Sector: In eastern Uttar Pradesh, per-capita investment in industrial sector was Rs. 37.31 which is very low comprising than western Uttar Pradesh. Ambedkarnagar district had highest weighted value with per-capita investment in industrial sector highest (Rs. 85.19) while Gorakhpur district had lowest investment in industrial sector (Rs. 3.83).

F. Employment in Industrial Sector/1000 Population: Employment in industrial sector is 1.67 persons per 1000 population which is not satisfactory. Mahrajganj district had highest weighted value with highest (employment of 2.91) per-capita investment in industrial sector followed by Varanasi, Bahraich and Sonbhadra while lowest people engaged in industrial activities was found in Gorakhpur district (Table- 1).

G. Availability of Bank's Branches per Lakh Population: More than 7 bank branches were providing banking facilities to per lakh population in 2014. Some changes occurs due to types of banking promotion schemes (like, Jan-Dhan, Mudra etc.) launched by new central

government. Kaushambi district had highest number of banks per lakh population (30.45 banks/lakh population) with highest weighted value (Table- 1) followed by Varanasi, Gorakhpur, Sultanpur, Sonbhadra, Faizabad, Ballia, Ghazipur and Chandauli whereas Allahabad district had the lowest bank's branches on per lakh population (only 1.33 banks provided service to one lakh population). However, economic development, urbanization and industrialization are promoting the availability of this service. Districts of high ranks is suitable for this example, but, Allahabad is exception of this theory because of huge population especially, highest share of rural population.

H. Percentage of Electrified Households: Total 24.21 per cent households were used electricity (2011). Varanasi district had 40.13 per cent household used electricity followed by Mau, Sultanpur, Gorakhpur, Mirzapur and Allahabad while Shrawasti district has only 10.1 per cent electrified households.

I. Length of Metallic Road per 100 Km²: An average, availability of metallic road in eastern Uttar Pradesh was 59.65 kms. in per 100 km². Varanasi district had maximum metallic road per 100 km² (154.18 kms.) (Table- 1) followed by Sant Ravidas Nagar (103.16 kms.), Jaunpur (102 kms.), Ghazipur (near about 91 kms.) and Deoria (90.47 kms.) while Sonbhadra district has only 20.16 kms metallic road per 100 km² area with least weighted value (13.077) followed by Balrampur, Gonda, Bahraich, Basti, Sant Kabir Nagar, Siddharthnagar, Mahrajganj and Mirzapur. Availability or development of metallic road (which includes national highways, state high-

ways, district link roads and other) shows that Varanasi and its neighboring districts, like, Sant Ravidas Nagar Bhadohi (famous for carpet making), Jaunpur (long length of NH 56) and Ghazipur (long length of many highways) is rich in this type of roads whereas in maximum districts of Saryupar plain as well as Tarai region which is backward in view of industrialization and less urbanization and two districts, i.e., Mirzapur and Sonbhadra (both are plateau region) availability of metallic roads is very less.

J. Percentage of Households had Mobile Phone: In, eastern Uttar Pradesh, about 63.25 per cent households (out of total households in the district) had mobile phone service in 2014. Deoria district had highest per cent of households (75.61 per cent) with mobile phone with highest weighted (Table 1& 2) followed by Sant Kabir Nagar (71.41 per cent), Jaunpur (71.26 per cent), Gorakhpur (71.20 per cent), Azamgarh (70.85 per cent), Pratapgarh (68.94 per cent), Basti (68.64 per cent), Siddharthnagar (68.6 per cent) and Kushinagar (68.42 per cent). Sonbhadra district had lowest per cent of household with mobile phone service.

K. Percentage of Households had Television: Only 21 per cent households had television in the study area. Varanasi district had highest 41.24 per cent households which had television. It was followed by Chandauli (33.47 per cent), Sant Ravidas Nagar (30.04 per cent), Mirzapur (29.62 per cent), Jaunpur (29.27 per cent), Allahabad (28.28 per cent), Gorakhpur (27.59 per cent) and Mau (24.36 per cent) while Balrampur district had only 7.46 per cent household with television.

L. Percentage of Households had Computer: Only 6.67 per cent households were enjoying computer facility in the eastern Uttar Pradesh. Ghazipur district had highest 9.3 per cent households with computer (Table- 1) followed by Ballia (8.67 per cent), Mau (7.78 per cent), Basti (7.6 per cent), Jaunpur (7.54 per cent), Sant Kabir Nagar (7.38 per cent), Ambedkarnagar (27.59 per cent) and Deoria (7.13 per cent) while Balrampur district had only 4.63 per cent household get television facility.

M. Availability of Hospitals per lakh Population: Only 4.76 hospitals (included CHCs, PHCs and District Hospitals) were providing healthcare facilities to per lakh population in 2014 (Table- 2), in which, maximum hospitals on per lakh population was found in Faizabad district (8.98 hospitals) whereas Balrampur district had lowest hospitals on per lakh population (only 3.4).

N. No. of Family and Mother-Child Welfare Centres/Sub-Centres in per 100 km²: Near about 10 Family and Mother-Child Welfare Centres/Sub-Centres were provided healthcare facilities in per 100 km² in 2014 (Table- 2), in which, maximum centres was found in Varanasi district (22.73 centres). It was followed by Sant Ravidas Nagar Bhadohi, Gorakhpur, Mau, Deoria and Kushinagar. Sonbhadra district had lowest centre (3.19 centres) in per 100 km².

O. Percentage of Households having Toilet: Only 34.41 per cent households using home toilet facility in the eastern Uttar Pradesh in 2014 (Table- 2). Highest percentage of households home toilet facility was found in Azamgarh district (75.87 per cent) with highest weighted. It was followed by Shrawasti

(70.45 per cent), Ambedkarnagar (56.56 per cent) and Mirzapur (52.37 per cent) while Sultanpur district had only 9.2 per cent household which enjoying toilet facility. Toilet facility of these districts was basically provided by governmental schemes.

P. Percentage of Literates: There were 67.4 per cent literates out of total population of eastern Uttar Pradesh in 2011. Highest literacy rate was found in Varanasi district (75.6 per cent) followed by Mau (73.09 per cent), Allahabad (72.32 per cent) and Ambedkarnagar (72.23 per cent) while lowest literacy rate was found in Shrawasti district (46.74 per cent) followed by Bahraich (49.36 per cent) and Balrampur (49.51 per cent). It is seen that lowest literacy rate was found in districts of Saryupar plain due to lack of educational facilities, poverty and people's awareness towards education.

Q. Percentage of Female Literates to total Female Population: Female literacy is an important indicator of development of any modern society. In eastern Uttar Pradesh, about 55 per cent females were literate out of total female population in 2011. Highest literacy rate among females was found in Varanasi district (66.7 per cent) followed by Mau (63.6 per cent), Ambedkarnagar (62.7 per cent) and Allahabad (61 per cent) while lowest literacy rate was found in Shrawasti district (34.8 per cent) followed by Balrampur (38.4 per cent) and Bahraich (39.2 per cent). Lowest literacy rate in females was found in the districts of Tarai region.

R. No. of Females per 1000 Males: Sex ratio is an important indicator of any ideal society. In 2011, 952 female was found

on 1000 males. Highest number of female on per 1000 males (sex ratio) was found in Jaunpur district (1024) followed by Azamgarh (1019), Deoria (1017) and Pratapgarh (998) while lowest number of female on per 1000 males was found in Shrawasti district (881) followed by Bahraich (892) and Balrampur (901).

S. Percentage of Urban Population: About 12 per cent population of eastern Uttar Pradesh was living in urban areas in 2011 which is very less than other areas of country. Highest percentage of urban population was found in Varanasi district (43.44 per cent) followed by Allahabad (24.74 per cent), Mau (22.63 per cent) and Gorakhpur (18.83 per cent) while lowest percentage of urban population was found in Shrawasti district (only 3.46 per cent) followed by Kushinagar (4.72 per cent) and Mahrajganj (5.02 per cent).

T. Percentage of Households 'Above Poverty Line' (APL): In 2014, Only 61.33 per cent households were above poverty line in the eastern Uttar Pradesh (Table- 2). Highest percentage of households above poverty line was found in Deoria district (94.86 per cent) because of agro-based industrial development (especially sugar industry). It was followed by Sant Ravidas Nagar (87.57 per cent), Varanasi (85.5 per cent), Gorakhpur (81.48 per cent), Allahabad (78.65 per cent), Mahrajganj (74.17 per cent) and Faizabad (71.53 per cent) while lowest households above poverty line or highest households 'below poverty line (BPL)' was found in Bahraich district which had only 21.58 per cent household above poverty line. It was followed by Kaushambi district (30.65 per cent), Ambedkarnagar

(38.73 per cent), Sonbhadra (42.91 per cent) and Mirzapur (48.53 per cent). It is seen that high urbanized and industrialized districts had highest households above poverty line.

Levels of Regional Development

(a) Region of High Development

Region of high development (having the composite index of development more than 78.694) includes five districts namely, Varanasi, Ambedkarnagar, Deoria, Mau and Sant Ravidas Nagar Bhadohi (Table- 2 and Fig. 1). This region have more than 87.72 percent of irrigated net sown area, 30.33 percent energy used in agricultural sector, 11.37 percent energy used in industrial sector, availability of 59.35 industries per lakh population, Rs. 52 per capita investment in industrial sector and 1.93 persons per thousand population where engaged in industrial sector, about 7.87 bank branches available in per lakh population, about 32.36 percent houses used electricity and availability of metallic road is 95 km per 100 km², about 5 hospitals were working for per one lakh population, availability of Family and Mother-Child Welfare Centres/Sub-Centres was 16.17 in per 100 km², 36.7 per cent used own toilet, literacy rate of this region was 72.2 per cent, female literacy rate was 61.68 per cent and sex ratio was 968 whereas 20.5 per cent population lived in urban areas and 73.8 per cent households were above the poverty line. Besides, these good conditions of economic development, maximum people of this region have advance means of communication, i.e., out of total 67 percent households have mobile phone, 26.67 percent households had television and 7.13 percent households used computer and laptop (Table- 1 and 2).

Varanasi district has composite index of 100 with 83.48 percent of irrigated net sown area, 8.61 percent energy used in agricultural sector, 10.29 percent energy used in industrial sector,
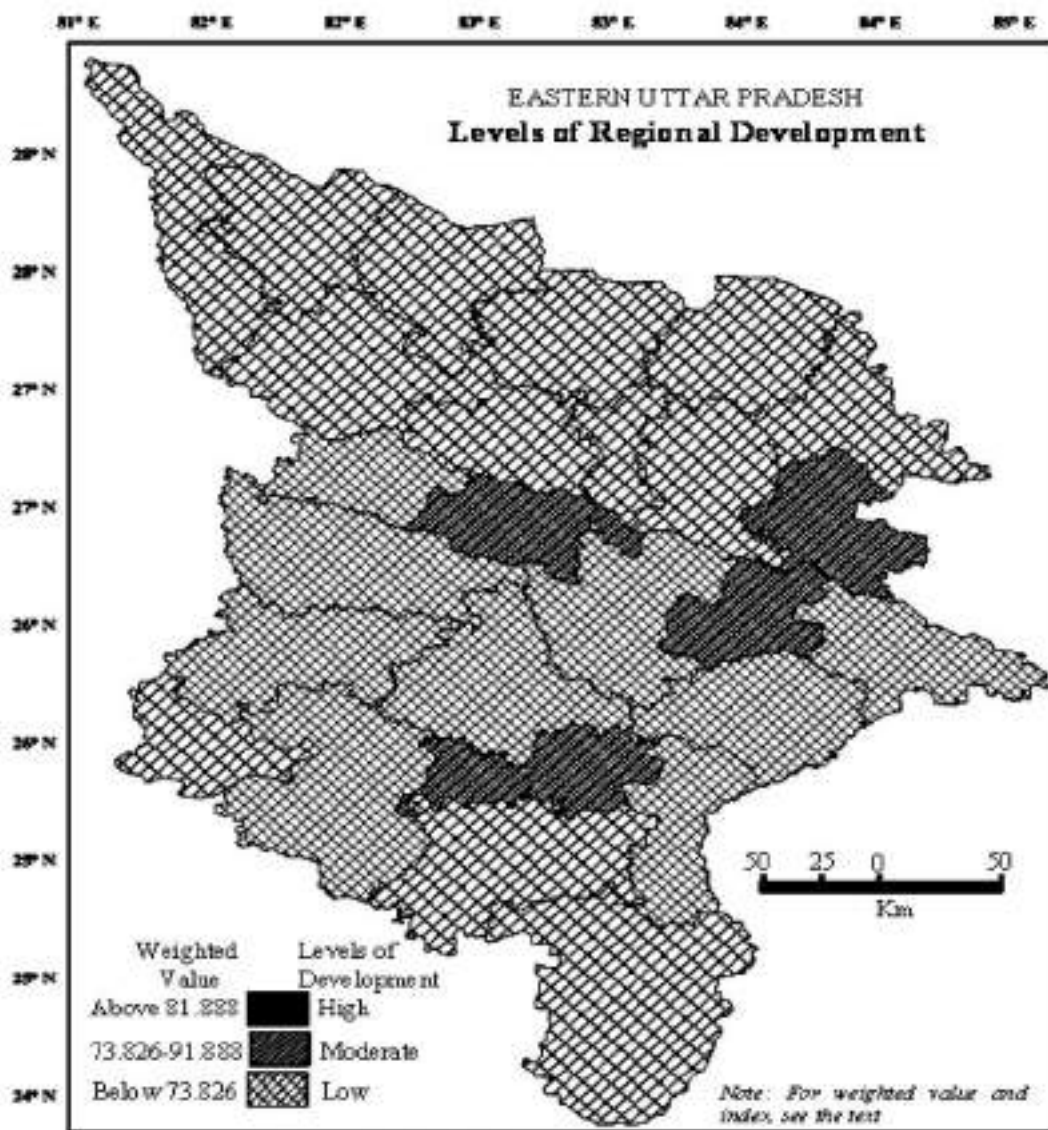
Figure 1: Spatial distribution of development

availability of 63.26 industries per lakh population, Rs. 66.35 per capita investment in industrial sector and 2.74 persons per thousand population where engaged in industrial sector; about 12 bank branches were available in per lakh population, 40.13 percent houses used electricity and availably of metallic road was 154.18 km per 100 km²; about 7.45 hospitals were working for per one lakh population and availability of Family, Mother-Child Welfare Centres/Sub-Centres was 22.73 in per 100 km² and 42.08 per cent households were using own toilet; literacy rate of this district was 75.6 per cent, female literacy rate was 66.7 per cent and sex ratio was 913 whereas 43.44 per cent population lived in urban areas and more than 85 house-

Table 1: Indicators of Regional Development

District	Percentage of irrigated area to net sown area (A)	Percentage of Energy used in agricultural sector (B)	Percentage of Energy used in industrial sector (C)	No. of Industries per lakh population (D)	Per-capita investment in industrial sector (Rs.) (E)	Employment in industrial sector per 1000 population (F)	No. of bank's branch per lakh population (G)	Percentage of electrified households (H)	Length of metallic road per 100 km² (I)	Percentage of households had mobile (J)	Percentage of households had television (K)	Percentage of households had computer (L)
Allahabad	76.20	16.70	8.45	52.18	25.02	1.43	1.33	30.88	61.58	59.68	28.28	6.59
Ambedkarnagar	94.42	71.20	22.78	68.69	85.19	2.05	7.01	22.99	61.24	66.50	15.04	7.21
Azamgarh	93.64	21.60	5.63	40.03	12.23	1.05	6.31	24.37	60.42	70.85	22.62	6.65
Bahraich	51.51	56.20	5.65	104.71	80.35	2.72	6.37	10.33	37.17	40.80	8.79	5.66
Ballia	78.21	32.38	5.71	63.63	27.19	2.06	8.27	21.61	63.82	65.95	21.46	8.67
Balrampur	34.56	37.32	6.68	36.67	21.37	0.93	4.00	13.52	31.72	57.30	7.46	4.63
Basti	71.06	25.69	12.38	74.82	35.63	2.12	7.02	25.72	40.07	68.64	17.57	7.60
Chandauli	91.95	27.91	27.54	12.14	69.22	0.55	7.78	28.20	70.53	58.81	33.47	6.35
Deoria	88.24	18.83	8.56	76.04	32.79	1.65	5.64	28.11	90.47	75.61	22.66	7.13
Faizabad	88.80	23.17	11.31	83.45	43.15	1.62	8.30	23.25	68.74	59.22	17.54	5.98
Ghazipur	84.30	48.60	7.15	71.51	31.71	1.86	8.15	16.53	90.99	64.81	24.13	9.30
Gonda	89.69	18.67	12.1	89.58	44.80	2.22	4.60	15.41	32.42	59.88	11.24	5.41
Gorakhpur	82.05	6.93	7.72	12.77	3.83	0.23	10.22	32.10	77.80	71.20	27.59	7.10
Kaushambi	68.92	51.51	4.44	41.01	13.47	1.00	30.45	12.96	66.36	51.84	17.28	5.30
Kushinagar	74.38	6.08	4.99	32.63	22.38	0.85	5.69	21.04	64.09	68.42	16.94	6.24
Mahrajganj	83.66	6.05	26.12	84.66	36.15	2.91	6.63	20.07	44.95	65.07	18.35	6.34
Mau	92.46	23.67	9.21	38.39	22.16	1.66	6.98	37.96	66.25	68.23	24.36	7.78
Mirzapur	59.33	33.47	10.84	45.78	33.54	1.86	7.53	31.35	46.96	54.20	29.62	5.48

Source: Calculated by the author

Table 2: Indicators and Levels of Regional Development

District	Hospitals per lakh population (M)	No. of Family & mother-child Welfare centres /sub-centres / 100 km² (N)	Percentage Of households Having Toilet (O)	Percentage of Literates (P)	Percentage of Female literates to total female (Q)	No. of Females per 1000 males (R)	Percentage of urban population (S)	Percentage of Households Above Poverty Line (T)	Composite Value (A+.......T j)	Composite Index
Allahabad	3.76	11.33	24.74	72.32	61.00	901	24.74	78.65	1124.999	72.155
Ambedkarnagar	3.71	12.20	56.36	72.23	62.70	978	11.71	38.73	1315.977	84.404
Azamgarh	4.25	12.14	75.87	70.93	60.90	1019	8.53	66	1142.676	73.289
Bahraich	3.73	7.80	35.7	49.36	39.20	892	8.14	21.58	1012.821	64.960
Ballia	6.79	12.23	31.39	70.94	59.80	937	9.39	53.48	1179.523	75.652
Balrampur	3.40	6.62	22.71	49.51	38.40	928	7.74	68.79	803.699	51.548
Basti	4.34	11.08	21.67	67.22	56.20	963	5.60	58.31	1112.437	71.349
Chandauli	4.40	11.84	25.83	71.48	60.40	918	12.42	59.33	1160.891	74.457
Deoria	5.29	14.08	31.89	71.13	59.40	1017	10.22	94.86	1249.582	80.145
Faizabad	8.98	9.99	21.13	68.73	59.00	962	13.77	71.53	1197.745	76.821
Ghazipur	5.00	12.30	24.24	71.78	60.30	952	7.58	59.55	1210.062	77.611
Gonda	3.64	8.10	25.50	58.71	47.10	921	6.55	67.84	1088.769	65.983
Gorakhpur	4.86	15.81	15.74	70.83	59.40	950	18.83	81.48	1084.331	69.547
Kaushambi	3.44	9.87	51.59	61.28	48.60	908	7.78	30.65	1027.392	65.895
Kashinagar	4.38	12.90	33.13	65.25	52.40	961	4.72	62.91	978.579	62.764

Source: Calculated by the author

holds were above the poverty line. Besides, these good conditions of economic development, maximum people of this region have advance means of communication, i.e., out of total 62.54 percent households had mobile phone, 41.24 percent households had television facility and about 7 percent households used computer and laptop. It is followed by Ambedkarnagar (with composite index of 84.404), Deoria (composite index of 80.145), Mau (composite index of 79.255) and Sant Ravidas Nagar (composite index of 78.7).

The districts of this region have fertile soil, irrigation facilities, favorable climate and developed as industrial hub. Varanasi city provides better education and health facilities, employment opportunities, huge market for local production and it's also famous for silk industry. Maximum markets as well rural areas of Ambedkarnagar district are associated with loom industry (Handloom and Power loom both) which developed as cottage industry, however, Ambedkarnagar and Mau are Muslim dominated area and they earns good amount in Gulf countries. Deoria known as old hub of sugar industry and Sant Ravidas Nagar Bhadohi is famous for their carpet industry.

(b) Region of Moderate Development

This region (composite index 72.155 - 78.285) includes nine districts, i.e. Jaunpur, Ghazipur, Faizabad, Ballia, Chandauli, Pratapgarh, Sultanpur, Azamgarh and Allahabad (Table- 2 and Fig. 1). This region had more than 85.6 per cent of irrigated net sown area, 26.43 per cent energy was used in agricultural and 11.04 per cent energy was used in industrial sector, 62.37 industries were available on per lakh population, Rs. 37.58 per capita investment and 1.57 persons per thousand population where engaged in industrial sector; an average 7 bank branches were available in per lakh population, 25.24 percent houses used electricity and availably of metallic road was 73 km per 100 km². Besides, out of total 64.87 percent households had mobile phone, 24.38 percent households had television and 7.10 percent households were

used computer and laptop while about 5.2 hospitals were working for per one lakh population, availability of Family and Mother-Child Welfare Centres/Sub-Centres was 11.08 in per 100 km², 30.96 per cent used own toilet, literacy rate of this region was 70.8 per cent, female literacy rate was 59.77 per cent and sex ratio was 966 whereas 10.54 per cent population lived in urban areas and 61.59 per cent households was above the poverty line (Table- 1 and 2).

Jaunpur district has composite index of 78.285 with 87.22 percent of irrigated net sown area, 22.46 percent energy used in agricultural sector, 22.83 percent energy used in industrial sector, availability of 43.75 industries per lakh population, Rs. 53.99 per capita investment in industrial sector, 1.57 persons per thousand population engaged in industrial sector; more than 6 bank branches were available for per lakh population, 23.34 percent houses used electricity, 102 km metallic road available in per 100 km²; 3.9 hospitals for per one lakh population, 12.58 family, mother-child welfare centres/sub-centres per 100 km², 45.6 per cent households had own toilet; 71.55 per cent literacy rate, 59.8 per cent female literacy rate, sex ratio was 1024, 7.7 per cent population lived in urban areas and 59.58 households were above the poverty line. Besides, these conditions of economic development, people of this region had advance means of communication, i.e., more than 70 percent households had mobile phone, 29.27 percent households had television and only 7.54 percent households used computer and laptop. After Jaunpur, Ghazipur had second position in development with composite index of 77.611 followed by Faizabad (76.821), Ballia (75.652), Chandauli (74.457), Pratapgarh (74.442), Sultanpur (73.478), Azamgarh (73.289) and Allahabad (72.155). These districts have fertile soil and irrigation facilities, therefore, maximum of these agriculturally developed except, Pratapgarh district but it is rich in Indian Gooseberry (Awla) production. Remaining districts are rich in agricultural production.

(c) Region of Low Development

Region of Low Development is considered as composite index below 71.524. It includes remaining 13 districts, in which maximum districts are located in Saryupar Plan as well as Tarai region, i.e., Mahrajganj, Sant Kabir Nagar, Basti, Gorakhpur, Gonda, Siddharthnagar, Bahraich, Kushinagar, Shrawasti and Balrampur, only, Mirzapur, Kaushambi and Sonbhadra district are out of Saryupar plain (Table- 2 and Fig. 1). Districts of this region had 64.55 per cent of irrigated net sown area, 26.64 per cent energy used in agricultural and 13.95 per cent energy used in industrial sector, 56.75 industries available on per lakh population, Rs. 33.92 per capita investment and 1.63 persons per thousand population were engaged in industrial sector; more than 8 bank branches were available in per lakh population, 20.24 percent houses used electricity and availably of metallic road was 47.13 km per 100 km². Besides, out of total 58.79 percent households had mobile phone, more than 16 percent households had television and 6 percent households used computer and laptop while about 4.37 hospitals were working for per one lakh population, availability of Family and Mother-Child Welfare Centres/Sub-Centres was 9.2 in per 100 km², 36 per cent used own toilet, literacy rate 60.78 per cent, female literacy rate 48.93 per cent and sex ratio was 932 whereas 8.65 per cent population lived in urban areas and 56.36 per cent households were above the poverty line (Table 1 and 2).

Mahrajganj was highest developed district in this region (composite index of 71.524) with about 83.66 percent of irrigated net sown area, 6.05 percent energy used in agricultural and 26.12 percent in industrial sector, 84.86 industries per lakh population, Rs. 36.15 per capita investment in industrial sector and per thousand 2.91 persons engaged in industrial sector, 6.63 bank per lakh population, 20.07 percent houses used electricity and 44.95 km metallic road per 100 km², 65.07 percent households have mobile phone, about 18.35 percent have television and 6.34 percent households have computer

while about 3.8 hospitals were working for per one lakh population, availability of family and mother-child welfare centres/sub-centres was 10.08 in per 100 km², 22.47 per cent used own toilet, literacy rate of this region was 62.76 per cent, female literacy rate was 48.9 per cent and sex ratio was 943 whereas 5.02 per cent population lived in urban areas and 74.17 per cent households were above the poverty line (Table-1 and 2).

After Mahrajganj, Sant Kabir Nagar got second position in the regional development with composite in of 71.454 followed by Basti, Mirzapur, Sonbhadra, Gorakhpur, Gonda, Kaushambi, Siddharthnagar, Bahraich, Kushinagar and Shrawasti while Balrampur most backward district with least composite index of 51.548. These districts have fertile soil for intensive agriculture. However, the districts of Saryupar plain produced huge amount of sugarcane and sugar industry has been developed since earlier of 19th century, but, since last three decades, they are facing the problems, i.e., unfavorable government policies, old machineries and out-dated technology etc.

Conclusion:

Eastern Uttar Pradesh is likely to be rich in agricultural sector and as well as agro-based industrial activities but, it is backward region. An average, availability of metallic road in eastern Uttar Pradesh is 59.65 kilometers in per 100 km², but, in the Tarai region availability of metallic roads is very less. Level of development shows that Varanasi, Ambedkarnagar, Deoria, Mau and Sant Ravidas Nagar districts include in high developed region which have fertile soil, irrigation facilities and industrially developed; Jaunpur, Ghazipur, Faizabad, Ballia, Chandauli, Pratapgarh, Sultanpur, Azamgarh and Allahabad categories as moderately developed while low developed region includes remaining districts, in which maximum districts are located in Saryupar Plan as well as Tarai region. Study area was facing the problems of industrial sickness, lack of infrastructure, education and natural hazards

(especially, flood) are the major factors responsible for backwardness of these districts. However, governments have been adopting the several schemes and programmes and provided the special package for the development of this region, but, it is not sufficient, because of the problems of economic development are complex and multidimensional (World Bank, 2000). Therefore, it must that strong steps of government, awareness of local people and development of infrastructures will be make a suitable environment for the development of eastern Uttar Pradesh.

References:

Binns, J. A., 1995, 'Geography in Development', *Geography,* Vol. 80, Pt. 4, pp. 303-322.

Datt, Gaurav and Mahajan, Ashwani, 2011, *Indian Economy* (63nd Revised Edition), S. Chand & Company Ltd., New Delhi, p. 290.

Government of India, 1951, Report of the First Five Year Plan, *Planning Commission,* New Delhi, p. 7.

Krugman, Paul, 1995, Development, Geography, and Economic Theory, MIT Press, Cambridge, pp. 17-33.

OECD, 2016, 'What is Regional Development' answer available on http://www.oecd.org/gov/regional-policy/ regionaldevelopment.htm, accessed on 20.08.2016.

Shafi, M., 1984, Agricultural Productivity and Regional Imbalances- *A study of Uttar Pradesh,* Concept Publishing, New Delhi.

Sharma, P.R., 1984 a, 'Spatioal Organization Model for Rural Development: An Approach through Settlement System', *Habitat International,* Oxford, Vol. 8, No. 1, pp. 29-34.

Sharma, P.R., 1984 b, 'Growrth Centres and Regional Development- aspects of Theory and Policy', *Habitat International,* Oxford, Vol. 8, No. 2, pp. 133-150.

Sharma, P.R., 1994, 'Regional Policies and Development', Sharma, P.R. (Ed), Regional *Policies and Development in Third World,* Rishi Publication, Varanasi.

Sharma, P.R., 1998, An Appraisal of Regional Development in Uttar Pradesh*, National Geographical Journal of India,* Varanasi, Vol. 44, N0. 1-4, march- December, pp. 140-47.

Sharma, P.R. (Ed.), 1991, *'Perspective on the Third World Development'*, Rishi Publication, Varanasi.

Sharma, V. N. and Tiwari, A. K., 2014, Growth and Levels of Urbanization in Eastern Uttar Pradesh, *The Geographical Review of India,* Vol. 76 (2), pp. 142-152, Kolkata.

Sharma, V.N., 2004, Level of Industrial Development in Madhya Pradesh, *Geographical Review of India,* Vol. 66(1).

Sharma, V.N., 2006, Agro-Based Industries in Mahrajganj District (U.P.) A Regional Analysis, *National Geographer*, Allahabad, Vol. XLI, No. 1+2, p. 21-31.

Singh, B.N.P., 1991, *Programme and Policies of Planning in India,* Deep & Deep Publications Pvt. Ltd., New Delhi, p. 1.

Syrous K. K. and Laura M. B., 2007, Economic Development Planning Models: A Comparative Assessment, International *Research Journal of Finance and Economics, Issue* - 7, pp. 120-139. Available at http://www. eurojournals.com/ finance.htm, accessed on 03.08.2016.

Tiwari, A. K., 2014, *'Problems and Prospects of Sugar Industry in Eastern Uttar Pradesh'*, Unpublished Ph.D. Thesis, Department of Geography, Banaras Hindu University, p. 197.

Tiwari, A.K. and Sharma, V.N., 2011, Level of agro-based Industrial Development in eastern Uttar Pradesh, *National Geographical Journal of India, Varanasi,* Vol. 57, N0. 4, pp. 43-52.

Todaro, M. and Smith, S., 2012, *Economic development (11th ed.),* Boston: Addison Wesley, p. 5.

Veneri, P. and V. Ruiz, 2013, "Urban-to-Rural Population Growth Linkages: Evidence from OECD TL3 Regions", OECD Regional Development Working Papers, 2013/03, OECD Publishing, available at-http://dx.doi.org/10.1787/5k49lcrq88g7-en, accessed on 20.08.2016.

World Bank, 2000, Entering the 21st century-World development report 1999/2000, New York: Oxford University Press. ●●●

Geographical Zones of Varanasi City: Past to Present

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Abstract

Geography is a spatial science which investigates every process, phenomena and problem in a space with reference to time. To analyse different phenomena and of course their interaction geographically, it is essential to demarcate geographical zones of the city. In an urban centre, the processes, phenomena and its outcome can be best studied by delineating the geographical zones. The aim of this paper is to review the previous attempts of delineation, basis of delineation and demarcate the geographical zones of present Varanasi city with future prediction. The present city has been divided into three distinct geographical zones based on differences in street layout, land use, pattern of settlement and morphology of the city. The paper reveals that the city's geographical zones are continuously expanding and this expansion follows the concentric zone model in general but some new nuclei are also developing.

Keywords : geographical zone, morphology, urban growth, street layout, land use

Introduction

Time and Space are two dimensions through which phenomena and facts can be seen. All the events occur over time and thus have history, but they also happen in space, at particular places and so they also have geography. Urban geography as a discipline evolved in the twentieth century which deals with the study of urban settlements within the framework of their geographical setting(Stamp, 1960; Pacione, 2013; Tripathi, 2018). In an urban centre, the processes, phenomena and its outcome can be best studied by delineating the geographical zones. A geographical zone is a homogeneous area within the city boundary comprising physical and cultural elements which differ from other zones (Singh,1955; Dube, 1976). The physical elements include structure, road pattern, types of buildings, land use and morphology while the cultural elements comprise the nature of economic activity, social group, historical background of the area. The nature of geographical zones is dynamic and the zones are influenced by population density and concentration of economic activity. According to Burgess (1925), urban growth is a process of expansion and reconversion of land uses, with a tendency of each inner zone to expand in the outer zone. Towns and cities are often complex and its urban charac-

teristics are found at the core and decrease as move towards the periphery. These geographical zones can be demarcated up to the limit where primary activity i.e. agriculture transforms the urban characteristics into rural characteristics (Singh, 2016). Therefore, demarcation of geographical zone is a very complex exercise because this is the base of geographical analysis of all activity occurring within an urban centre.

Various scholars across disciplines studied urban growth and demarcated geographical zones of cities. The scholars of Chicago School of Human Ecology were the first to give the model of urban growth and delineated different zones on the basis of some selected criteria. In 1925, Ernest Burgess proposed the Concentric Zone Model after the extensive study of Chicago city. The model identifies five different zones of a city i.e. Central Business District, Zone of Transition, Zone of Independent Workers Homes, Zone of Better Residences, Commuter's Zone. Hoyt(1939) proposed Sector Theory on the basis of his study of 142 American cities. His model was based on the Axial growth principle given by R.M. Hurd in 1903. Harris and Ullman (19450 postulated Multiple Nuclei Theory demarcating six zones of a city. Vance (1964) extended the Multiple Nuclei model and proposed Urban Realm Model. He proposed four realms i.e. CBD, New Downtown, Commercial Centers, Suburban Downtown. Mann (1965) gave a model that identifies four different zones in a city. White (1987) proposed a revision of the Burgess Model and divided urban centre into core, zone of stagnation, pockets of poverty and minorities, elite enclaves, the diffused middle class, industrial anchors, epicenters and corridors.

In India, the study of urban centers gains momentum in post-independence period. The urban centers were studied on the line of Chicago school. Singh (1955) and Singh (1966) de-

marcated Varanasi and Allahabad city respectively into different geographical zones Core, Middle, Outer Zone and Suburban areas. These zones were demarcated on the basis of selected criteria i.e. the type and density of houses, the nature and character of roads and the general pattern of land use and social and economic structure. Singh (1968) studied the city of Ahmedabad and identified different geographical zones i.e, Inner, Inner fringe belt, Intermediate, Outer and Suburban Zone on the basis of functional land uses and morphogenetic type of plan. Dubey (1976), in his study of KAVAL towns, distinguished four zones, i.e. Core, Middle, Outer and Suburban Zone. Various urban geographer continued the study of urban growth and demarcated geographical zones of different Indian cities following the tradition of Chicago school and Benaras school of urban geography (Singh 1986; Upadhyay 1988; Rai 1992; Singh 2002; Mishra 2010; Tiwari 2010; Tripathi 2015).

Municipality of Budapest (2014) divided the city into five urban zones i.e. Inner, Transitional, Suburban, Danube and Hilly zone based on its divergent characteristics in terms of urban structure, architecture, society and economy and the empowerment of these parts of the city or urban zones demand differing means of development. Urry et. al (2014) suggested that the spatial form of the city permitted the unique development of individuals able to interact with an exceptionally wide range of social contacts. Jones (2014) recommends the use of zonal analysis to better understand the dynamics of change in cities of the South Asia. The paper reveals that there was significant redistribution of population from the overcrowded central urban district to the outer part of the core. Prasad (2014) divided the city in three geographical zones (i.e. Core, Middle and Outer zone) on the basis of density and growth of urban population, terrain, built environment and land use to

generalise and characterise typical features of urban landscape. CDP (2015) divided the city into three distinct areas i.e. Old, Central and Periphery areas on the basis of economic activity, population concentration and road network. Soderstrom et. al (2015) prepared the report on the urban form in the Helsinki and Stockholm City Regions. Jha (2017) and Harshwardhan (2018) in their doctoral thesis delineated the geographical zones of Varanasi to study the informal settlements and morphological characteristics of the city respectively considering the street layout, land use, patterns of settlement and morphology of the city. The delineation of the geographical zones is an important aspect for geographers and planners to study the characteristics of an urban entity. This research paper has two main objectives; first, to present the evolution of the geographical zones and to delineate present geographical zones and Second, to study the dynamics of each zone and factors responsible for the change in geographical zones. The paper is based on morphogenetic approach of urban geographical studies. This paper reviews the previous attempts of delineation, basis of delineation and demarcates geographical zones of present Varanasi city with future prediction.

Previous Attempts

The first attempt to demarcate geographical zones of the city can be seen in the pioneering work of Prof. R. L. Singh (Singh, 1955). In his Ph.D. thesis, later published as a book, he divided Varanasi city into three geographical zones on the basis of morphological attributes (Fig.1). Later on, Dubey (1976) also demarcated geographical zones of Varanasi in his famous work on KAVAL towns. He also divided the city into three geographical zones (Fig 2.).

A. Geographical Zones of Varanasi City by R.L. Singh (1955)

Singh (1955) demarcated geographical zones of Varanasi in his PhD thesis, later pub-

lished as a book titled 'Banaras: A Study in Urban Geography'. His bases of delineation includes type and density of houses, nature and character of roads, general pattern of land use. Varanasi city had been divided into four geographical zones (Fig.1) as discussed below:

The Inner Zone: This zone had expended along the Ganga from Rajghat to a little north of the Assi. It was bounded by the Chauk-Rajghat and Dasaswamedh-Assi road in the west. The whole zone is entirely pukka (built-up) and typically represents the old Benaras. This entire zone represents the ancient core of the city.

The Middle Zone: The zone was primarily medieval in growth representing as a traditional belt. The zone was made conspicuous by the presence of numerous mosques, particularly in the vicinity of the Muslim settlements.

The Outer Zone: The outer zone had roughly encircled the Middle zone from Rajghat to the confluence of the Assi with the Ganga. This zone was characterised by numerous open spaces in the form of orchards and groves, large patches of cultivated lands. This zone had both old and modern bungalows. The Outer zone was mainly residential with small bazars catering for the needs of the residents.

Sub-urban Zone: This zone had mixture of rural and urban elements, it lied outside the city limits.

B. Geographical Zones of Varanasi City by K.K. Dubey (1976)

K.K. Dubey (1976) also demarcated the geographical zones of Varanasi considering the marked zonal differences in street layout, house-types, settlement pattern, building materials and land use. He delineated the city into four zones i.e, (i) Inner Zone (ii) Middle Zone (iii) Outer Zone and (iv) Suburban Zone (Fig. 2). All the KAVAL towns had considerably expanded in area, especially after the establishment of the corporation, having acquired a number of vil-

lages and agricultural land on the periphery (Dubey,1976).

Core or Inner Zone: It occupied the higher ground in the centre and was fully built up. This zone had two major functional sectors i.e. the Business and the Residential areas in the interior. The street network diverged from this zone to the different parts of the city with few wider roads and number of narrow streets, lanes and by-lanes. The upper floors of the houses were used for residential purpose and the ground floor was occupied by the retail shops.

Middle Zone: The residential character had predominated with overlapping of important business centres in the middle zone. This zone was well connected to the city's core area by wider roads. The roads were mostly straight and cross each other at rectangular or circular squares.

Outer Zone: This zone had specialised ar-eas such as Cantonment and newly developed colonies. The cantonment areas had vast open land with officer's bungalows and offices. The administrative and public offices and newly con-structed hotels and business areas were devel-oping in this zone.

Present Geographical Zones of the City: Demarcation and Characteristics

In this study, the present Varanasi city has been divided into three geographical zones tak-ing into account the previous attempts of Singh (1955) and Dubey (1976). Fig 5 shows the three distinguished geographical zones of the present Varanasi city. These zones have been demar-cated on the basis of the following criteria:

1. Street Layout (Fig.3) and Characteris-tics

2. Land Use as shown in Master Plan (Fig.4)
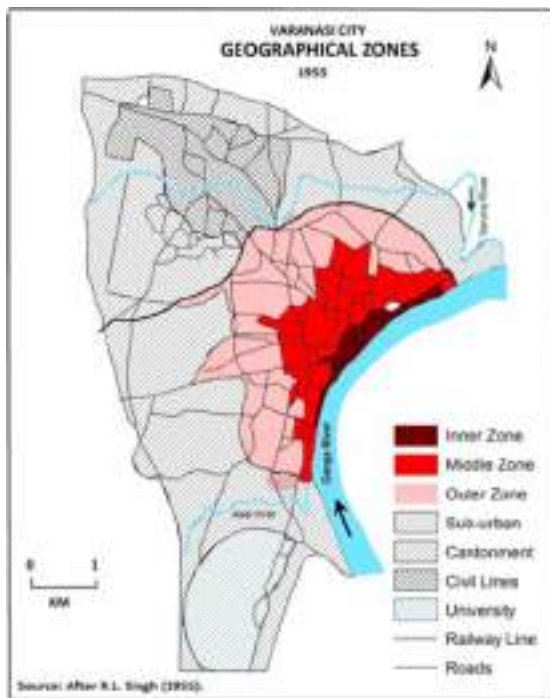
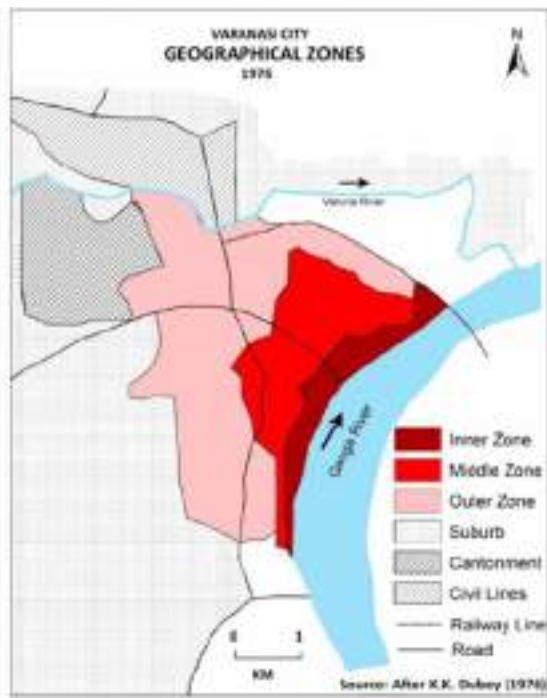3. The Pattern of Settlements

Figure 1: Geographical zones (1955)

Figure 2: Geographical zones (1976)

4.   Morphology of the city

The city has been divided into three distinct geographical zones based (Fig.5) and each zone has been discussed below in detail.

Core Zone: This zone is bounded by the Lanka-Cantonment road on the west, Allahabad-Mughalsarai railway line in north and Assi Nala in the south. The Core consists of the heritage strip along the bank of Ganga extending from Rajghat to Assi and the old city developed on the higher ground as well as the low-lying areas encircling higher ground. This area enjoys the advantages of its site and the momentum of the early settlement and economic activity. In the work of Singh (1955), the core zone was limited to Chauk-Rajghat road and Dasaswamedh Road-Assi Road. However, in the last 60 years, the core of the city has expanded much rapidly than any other, and it grows much wider in the western part of the city.

Earlier the core zone of the city was on the high ridge of the 'Kankar' forming left bank of the city, but now it has expanded in a radial form in all direction having the nucleus in Godowlia-Bisheshwarganj-Chowk area. The whole zone is now concrete and typical Banarasi elements can be seen in this zone. The inner part of the zone is characterised by narrow lanes and old buildings which evidences the remnant of the old city. The buildings of the inner core zone are characterised by Hindu architecture. This zone is very congested because of the desire of the people to reside on ghats near Ganga. The outer margin of this zone has developed in past three decades characterised by multi-storey apartments, broad road, modern styled buildings, shopping complex, malls etc. In inner core zone, the ground floors of the houses are used commercially and the upper floors are used for residential purposes.

In this zone, religious influence can be seen on street planning, structures and houses. This

Figure 3: Street Layout

Figure 4: Land Use

zone has all the important temples of Varanasi such as Kashi Vishwanath in Godowlia near Dasawamedh ghat, Kal Bhairav in Bisheshwarganj etc. The entire zone represents the old city, but the area south of Dashawamedh, west of Bhelupur and north of Rajghat are the newly built. The G.T. Road, which was the outer peripheral boundary of the city in 1980's, presently separates the core and the middle zone. The Dasawamedh- Assi- Chauk- Rajghat quadrilateral which was earlier the extremity of core has now become central axis of the core. All the roads of the inner core zone have approach lanes ending at the ghats of Ganges. In the northern part, north of Maidagin-Rajghat Road, most of the ancient remains are found scattered. Before the arrival of Muslims, this zone had numerous open spaces. The Muslim settlements are located on the Rajghat-Cantonment road, most of which are now identified as slum areas. Muslim settlements are also found in Macchodari, Sonarpura, Godowlia, Bulanala, Adampura, Jaitpura, Nati Imli, Golgadda, etc. In this zone influence of modernity can be found along Dasawamedh Road- Kamachchha road, Durgakund- Cantonment Road, Sigra crossing to Maldhaiya.

All the major commercial area of the city are located in the this zone like Bisheshwarganj, Godowlia, Tatheri Bazar, Gola Dinanath, Raja Ka Darwaja, Pilli Kothi, Sigra, Maldhaiya, Kamachchha etc. This zone also has many old educational institutions like Sampurnanand Sanskrit Vishwavidyalaya in Jagatganj, Mahatma Gandhi Kashi Vidyapith near Sigra, Bengali Tola Inter college in Sonarpura, Central Hindu Boys and Girls school in Kamachchha etc.

Middle Zone: The middle zone covers from north of Rajghat to Assi in south up to Lanka making a semi-circle. In the north, Panchkroshi road mark the boundary of this zone, in the west the D.L.W.-Lahartara-Cantonment Road is the limit and in the south, Lanka

to D.L.W. road and Assi Nala form the boundary. This zone has its origin in the medieval period. The Muslim trader and inhabitants settled along the major roads. The outer fringe of this zone has the recent settlements but the inner parts have traces of mixed culture of Hindus and Muslims architecture. This zone has residential areas primarily built after 1950's, and the areas along the roadside have developed as commercial areas. This zone has modern buildings and shopping areas along the roads, schools, hospitals, restaurants, government offices etc. This zone began to grow after independence because of the rapid population growth in the city due to immigration and natural growth. This zone is dominated by migrants who came to Varanasi after partition and migrant middle class families coming in the search of employment and education.

Singh (1955) characterized this zone by numerous open spaces, in form of orchard and
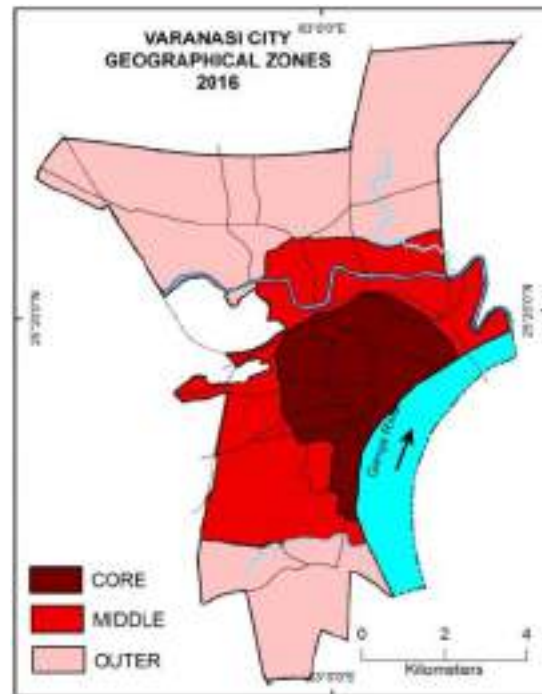

Figure 5: Geographical zones (2016)

grooves, large patches of cultivated lands, tanks and depressions. All these open spaces, tanks, depression, orchard and groves have now transformed into built-up area. Earlier, the houses of this zone were 'kutcha' or semi 'pakka' but now large houses of middle and high-income groups are found in this zone. After 1980's, this zone also marks the emergence of small nucleus centres of the city like Bhelupur, Sigra and Kamachchha. The vacant land on both sides of Varuna have been occupied by migrants and transformed into residential areas. Many Pockets of slums and unauthorised colonies are also found in this zone. There are many parks and open spaces in this zone. This zone also has many temples such as Sankat Mochan Temple, Durgakund Temple, Manas Mandir etc. The modern houses, apartments and bungalows can be seen along the roads like Lanka -Durgakund -Bhelupur -Kamacha -Cantonment Road, Chetganj to Nadesar road, Lanka to D.L.W. crossing, Rathyatra to D.L.W. road.

The northern part of this zone, located in the trans Varuna area, comprises the residential area of officers, merchants, traders in the Patel Nagar, Kachehri, Civil Lines and Cantonment. New planned residential colonies came up in Ravindrapuri, Sunderpur Nevada, near B.H.U, Nagwa, Kakarmatta, Kamachchha, Mehmoorganj, Sigra, Maldhaiya, Pahariya Pandeypur in last 30 years. This zone has most of the government offices and educational institutions..

Outer Zone: The outer zone has been identified only in the northern and southern part of the city and it is not continuous. The northern part of this zone is beyond the Panchkroshi road and southern part lies south of the Lanka-D.L.W. road. This zone grew and developed after 1990 due to expansion of city boundary. The middle and high-class families, in a desire to live in spacious houses settled in the outer margin of the city. This zone has been characterised by high and middle class colonies, newly developed industrial and commercial areas, wide streets and roads and lots of open space.

The Concentric Zone Model and Sector Theory can be applied to the city as the development and growth of the outer zone took place to cater the needs of the housing for the growing middle and high class population. The agricultural land of the outer zone has been transformed into residential colonies, most of them are unauthorised. In the northern part, there are still some open spaces in Sarnath, Shivpur, Pahariya area. The outer periphery of this zone has been characterised by peri-urban features and newly sparsely residential colonies. The influence of rural culture can be seen on the lifestyle and urban structure. This zone also embarks the development of new residential areas and shopping areas in Bhojubeer, Shivpur, Paharia, Ashapur and Sarnath in the North and B.H.U., Nagwa, Samne ghat, Sunderpur and Chitaipur in the South.

Dynamism of Geographical Zones of Different Periods

The comparative study reveals that the geographical zones are dynamic and they are dependent on spatial-temporal factors. The boundary of geographical zones changes with the concentration of population and economic activities of the city. In 1955, the core zone was concentrated along the banks of river Ganga from Assi to Rajghat, comprising Godowlia and its surrounding market areas and the Vishwanath temple; in 1976 it expanded up to the road from Lanka to Rajghat due to expansion of commercial areas. At present, this zone witnessed more spatial expansion towards western part touching the limits near to the Varanasi cantonment railway station because of the expansion of commercial areas, conversion of residential areas into commercial places, connectivity of the roads, railways and the emergence of Varanasi as a focal service point for Eastern Uttar Pradesh and Western Bihar.

The middle zone is encircled by inner and outer zone from all sides. In 1955, this zone was extended up to the Lanka-Sigra-Rajghat road. This zone was dominated by religious places, temples and mosques. There are distinct mohallas of Hindus and Muslims. Till 1976, not a lot change occurred in this zone; its expansion was limited to few areas but encroachment of open land and development of slums were major changes. In 2016, this zone expanded towards North, West and South, resulting in development of unauthorised colonies and apartments. Natural tanks were encroached by builders and colonizers, and government land was encroached by migrated slum dwellers. This zone crossed the Varuna river in north, where the major administrative establishments are located and touched the western limit of city engulfing Manduadih and some parts of Lahartara into city area. The Lanka-D.L.W road forms the southern boundary of this zone. This zone is dominated by residential functions, while earlier there were mix functions.

Outer zone is characterized by rural settlements having urban functions. In 1955, this zone was extended up to Shivpur in North, Manduadih in West and B.H.U. in south. At that time this zone was sparsely populated and there were vast open lands. Till 1976, there was almost no spatial expansion of this zone due to people's desire to live in old holy areas of the city. Due to rapid migration and an increase of land price, when migrants could not afford to live in central part of the city, they settled in outskirts. This zone shows massive spatial expansion in the last two decades. The rising population needs land to settle and the outer zone of city was perfect having plenty of vacant land at low cost. So, the migrated or relocated population chooses to settle in suburban areas leading to develop it as the outer zone of the city. The development of the roads, small market centers, colonies with all basic facilities attracted population.

Future Prediction

The geographical zones are dynamic and spatial-temporal factors influence them. The boundary of geographical zones has been changed with the diversification of the economy of the city. The city is expanding and so its geographical zones. Dubey (1976) had predicted that the city will follow multi-nuclei model, but the current scenario suggests that the city is still following the concentric zone model. The previous trend suggests that the city will expand in north-west and south- west direction. If geographical zones expansion continues to follow concentric zone model, than within 10 years Lanka-DLW road will delimit southern limit of core zone and northern expansion of the core zone will reach up to Panchkroshi road crossing Varuna river. The middle zone will cover the areas presently laying in outer zone and sub-urban areas and commuter belt will get developed as a new outer zone. This process will be rapid due to rapid development works and projects of government because the city is the election constituency of Prime Minister of India Shree Narendra Modi. However, the present trend shows the Concentric Zone Model growth of geographical zones, it cannot be overlooked that Lanka, Sarnath and ordarly Bazar have been developed as new nuclei. Either expansion of core zone will include these nuclei or the city will follow multi-nuclei model. Ramnagar and Pt. Deen Dayal Upadhyay Nagar (Mughalsarai) have been developed as two satellite town of Varanasi and new Ganga Bridge connecting Lanka to Ramnagar will increase the rate of amalgamation. Therefore, it will be very interesting to see future expansion of city with these two satellite town.

Conclusion

Urban growth is a process of expansion and reconversion of land uses. Varanasi is one of the oldest living cities of the world and the cultural capital of India. The paper reviews the attempts of demarcation of its geographical zones by Singh (1955) and Dubey (1976), and reveals that the city's geographical zones are continuously expanding. This expansion generally follows the concentric zone model but some new nuclei are developing. The present city has been divided into three distinct geographical zones based on differences in street layout, land use, pattern of settlement and morphology of the city. The paper remarks that the core zone of the city is the oldest, densely populated and characterised by narrow roads and highly congested areas including the heritage strip along the bank of Ganga. The Middle zone owns its origin in Muslim and British period, dominated by residential areas, while the outer zone has mix elements of rural and urban activities and developed after 1990 due to the expansion of the city. This zone is characterised by new middle and high-class residential colonies. The paper reveals that the boundary of geographical zones has been changed with the diversification of the economy of the city.

References

Burgess, E., 1925, The Growth of the City, in R. Park and E. Burgess (eds.) *The City Chicago,* University of Chicago Press, pp. 47-62.

CDP, 2015, *City Development Plan for Varanasi-2041.* Capacity Building for Urban Development Project, Ministry of Urban Development, available at https://www.nnvns.org/data/Final% 20CDP% 20Varanasi.pdf

Dubey, K.K., 1976, *Use and Misuse of Land in the KAVAL Towns,* UP (No.15). National Geographical Society of India. Varanasi.

Harris, C. and Ullman, E., 1945, The Nature of Cities, *Annals of the American Academy of Political Science,* 242, pp. 7-17.

Harshwardhan, R., 2018, *Morphology of Allahabad and Varanasi Cities: A Comparative Analysis,* Unpublished Ph.D. Thesis, Department of Geography, Banaras Hindu University, Varanasi.

Hoyt, Homer., 1939, The *Structural Growth of Residential Neighbourhoods in American Cities,* Federal Housing Administration, Washington DC, pp.112-122.

Hurd, R. M., 1903, *Principles of City Land Values New York:* Record and Guide.

Jha, D.K., 2017, *Informal Settlements, Multidimensional Poverty and Urban Planning: A Case Study of Varanasi City.* Unpublished Ph.D. Thesis, Department of Geography, Banaras Hindu University, Varanasi.

Jones, Gavin W.,2014, Urbanisation and Development in South-east Asia, *Malaysian Journal of Economic Studies,* 51 (1), pp. 103-120.

Mann, P., 1965, *An Approach to Urban Sociology,* London: Routledge.

Mishra, A.K., 2010, *Alwar: A Study of Urban Development and Planning,* PhD Thesis, Department of Geography, Banaras Hindu University, Varanasi.

Municipality of *Budapest Mayor's Office, 2014, Budapest 2030 Long Term Urban Development Concept,* E.P.C Printers.

Pacione, M., 2013, *Urban geography: A global perspective.* Routledge.

Prasad, Janki, 2014, *A Study of Urban Land Use and Planning of Jhansi City,* Unpublished Thesis, Department of Geography, Banaras Hindu University, Varanasi.

Rai, M.K., 1992, *Greater Gwalior: A Study in Urban Geography,* PhD Thesis, Department of Geography, Banaras Hindu University, Varanasi.

Singh, G.N., 2002, *An Analysis of Urban Land Use of Lucknow Metropolis,* PhD Thesis, Department of Geography, Banaras Hindu University, Varanasi.

Singh, Musafir, 1968, *Ahmedabad: A Study in Urban Geography. PhD Thesis, Department of Geography,* Banaras Hindu University, Varanasi.

Singh, O.P., 2016, *Urban Geography,* Sharda Pustak Bhandar, Allahabad.

Singh. R.L., 1955, *Banaras: A Study in Urban Geog-*

raphy, Nand Kishore and Bros. Varanasi.

Singh, U., 1966, *Allahabad: A Study in Urban Geography,* Banaras Hindu University, Varanasi.

Singh, Karamveer, 1986, *Chapra: A Study in Urban Social Geography,* Unpublished Thesis, Department of Geography, Banaras Hindu University, Varanasi.

Soderstrom, P. Schulman, H. Ristimaki, M., 2015, *Urban Form in the Helsinki and Stockholm City Region,* Finnish Environment Institute, Finland.

Stamp, L.D., 1960, *Applied Geography: How the Geographer's Survey and Analysis Can Help in   Understanding the Britain of Today and in Planning for Its Future* (Vol. 449). Penguin Books.

Tripathi, A., 2015, *Ghazipur Sehar ka Bhoomi Upyog, Samsyain evm Niyojan: Ek Bahugolik Adhhyan,* Unpublished Thesis, Department of Geography, Banaras Hindu University, Varanasi.

Tiwari, A., 2010, *An Appraisal of Urban Development and Planning of Mirzapur,* PhD Thesis, Department of Geography, Banaras Hindu University, Varanasi.

Tripathi, V.K. 2018, Approaches to Urban Geography, In V.K. Tripathi, Darshan Kumar Jha and Rahul Harshwardhan (Eds.), *Advances in Urban Studies in India,* RK Books, New Delhi, pp.1-17.

Upadhayay, S.B., 1988, *Jaipur City: Its Urban Land Use Problems and Planning,* Unpublished Thesis, Department of Geography, Banaras Hindu University, Varanasi.

Urry, John. Birtchnell, Thomas. Caletrio, Javier. Pollastri, Serena, 2014, *Living in the City Future of cities,* Working Paper Foresight, Government Office for Science, United Kingdom.

Vance, J., 1964, *Geography and Urban Evolution in the San Francisco Bay Area,* Institute of Government Studies, University of Carolina, Berkeley.

White, M.,1987, *American Neighborhoods and Residential Differentiation,* Russell Sage Foundation, New York.

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Gender Disparity in Literacy and its Rural-Urban Differentials: Block-Wise evidences from Lucknow District, U.P.

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Abstract

Literacy is a multidimensional concept, an important demographic element of human process and progress. It acts as a catalyst for overall development and helps in eliminating gender disparity at all levels.Literacy rate reflects the general achievement of growth for any region. Higher literacy corresponds to better health, higher productivity, high income, improved understanding & capability, better standard of living, lesser exploitation, increased participation in community life and above all consciousness of self. So, being a literate is imperative for a dignified life. Lucknow district exhibits varying levels of literacy among male-female population. The urban-rural contrastalso indicates spatial gender literacy variations. The present paper attempts to highlight and analyse gender disparity in literacy at district level, to identify the rural-urban differentials in literacy achievement of male-female population and its regional variations taking administrative blocks as study units.The study is based on published secondary sources of data collected from District Census Handbook. The methodology adopted for this empirical analysis includes the use of disparity and differential indexes along-with gap analysis. It is believed that the present study will be useful in reflecting geographical variations in gender literacy and may support literacy programmes in study region so as to achieve comprehensive rural-urban gender equality.

Keywords : literacy, gender, regional, census, disparity

Introduction

Literacy is considered one of the foremost indicators of socio-economic advancement and human progress. Literacy is essential for eradicating poverty and for permitting the free play of demographic processes (Chandna & Sidhu, 1980). It is an indispensable strategy for achieving development and is imperative for social reconstruction, improvement in quality of life, active participation, individualist consciousness and better understanding. Literacy stimulates social transformation & general well-being of a society. It is also a constituent of Human Development Index (HDI). Gender disparity in literacy retards the society and must be eliminated for holistic growth.

There is no common definition of literacy in world. UNESCO defines literacy as the "ability to identify, understand, interpret, create, com-

pute and use printed and written material associated with varying contracts". Population Commission of United Nations considers the ability to both read and write a simple message with understanding in any language a sufficient basis for classifying a person as literate. Census of India has adopted this definition & defines literate as a person aged 7 years and above, who can read and write with understanding in atleast one language.Literacy could be achieved through both adult literacy classes as well as any non-formal educational system.Literacy rate of the population is defined as the percentage of literates in the age-group seven years and above. The growth in literacy rate usually indicates the pace at which the life and economy of a particular society is being transformed.

Academicians, researchers and policy makers have rated literacy as an important factor for removing disparities. Literacy influences and determines qualitatively and quantitatively not only the human resources but also other population attributes like fertility, mortality, age of marriage and economic participation ultimately, aiming towards welfare of the society (Sawant & Lewis, 2004). Patel, I., and Dighe, A., (1997) were of the opinion that literacy is an instrument to empower women against inequality and injustice in society. Kofi Annan, former Secretary General of the United Nations had quoted, "Literacy is a bridge from misery to hope. It is a bulwark against poverty and a building block of development. Literacy is a platform for democratization and a vehicle for the promotion of cultural and national identity. Literacy is the road to human progress and the means through which every man, woman and child can realize his or her full potential". Sundaram, K.V., (1985) remarked that higher literacy is a good indicator for the sound economy as well as quality of life.

Literacy increases one's knowledge and understanding against exploitation and injustice,

help in decision-making and plays a crucial role in socio-economic well-being. The quality of population can be judged from the level of literacy, which brings us to the discussion of gender disparity in literacy. Developing regions are characterized not only by low literacy rates but also marked by a great disparity in male-female literacy and urban-rural literacy. Equally striking are the regional disparities in literacy differentials itself. These disparities in society is cause of concern because underachievement in gender literacy has the potential to disrupt socio-economic development.Literacy rate has increased appreciably in recent decades due to social awareness, increased infrastructure and demand for quality education, but disparities still exists between male and female population evident by unequal sex ratio, share in developmental benefits, socio-economic status and work participation etc. These deficiencies can be reduced and uprooted through improvement in literacy. Gender disparity in literacy needs to be studied spatially for ascertaining the patterns in village, town and overall district. Rural-urban differential in gender literacy emanates from the difference in type of economy, accessibility to services, status of females etc. It was observed in study region that rural areas dominated by agrarian practices experienced low literacy rates and higher gap between male-female literacy, on the other hand, tertiary driven urban areas recorded higher literacy rates than rural areas and gap between male-female literacy was comparatively very low, however there are visible disparities in literacy achievement of male-female population which warrants careful analysis.

Grover R.P., & Bhardwaj, R., (2002) have rightly pointed out that administrators and planners must pay greater attention in bridging the gap between literacy of males and females. Equally important is the role of other stakeholders like society, NGO's, and individuals in

general.Role of universal literacy in district like Lucknow cannot be overstated. Being a capital of most populous state, it usually serves as model for other cities. Literacy acts as tool of personal empowerment, while illiteracy hampers social advancement, economic growth and political maturity (Sawant & Athawale, 1994).Being literate and educated is fundamental and single most important thing for every person which is still far from being realised.The main objectives of the present research paper are as follows:

- To find out the gender disparity in literacy rate and its rural-urban differentials in Lucknow district for 2011.

- To analyse the block level regional variations of gender disparity in literacy.

- To identify deficient areas of literacy in study region and suggest viable mea-

sures for its elimination.

Study area

Lucknow, the capital of Uttar Pradesh is almost centrally located in the state on the banks of river Gomati. Historically, it has always been a great centre of art, culture, literature and learning. The district lies between 26°30' to 27°10' North latitude and 80°34' to 81°12' East longitude. Lucknow district is bounded in the north by district Sitapur, on the east by Barabanki, on the south by Rae Bareli, on the north-west by Hardoi and on the south-west by Unnao. The district has a total area of 2528 sq. km, with rural area covering 2057.3 sq. km. while urban area occupies 470.7 sq. km. The river Gomati flows across the district from north-west to south-east, river Sai also drains the district.

Administratively, the district is divided into 4 tahsils and 8 development blocks namely Mal, Malihabad, Bakshi KaTalab, Chinhat, Kakori, Sarojaninagar, Gosainganj and Mohanlalganj (Figure 1). There are a total of 807 villages and 12 towns (10 statutory towns and 2 Census towns). Only 1 block of Mal has no urban population, all blocks have fairly good spatial extent however rural-urban representation vary significantly.

According to Census of India 2011, the district had a total population of 4589838 (decadal growth of 25.8 per cent) with male and female
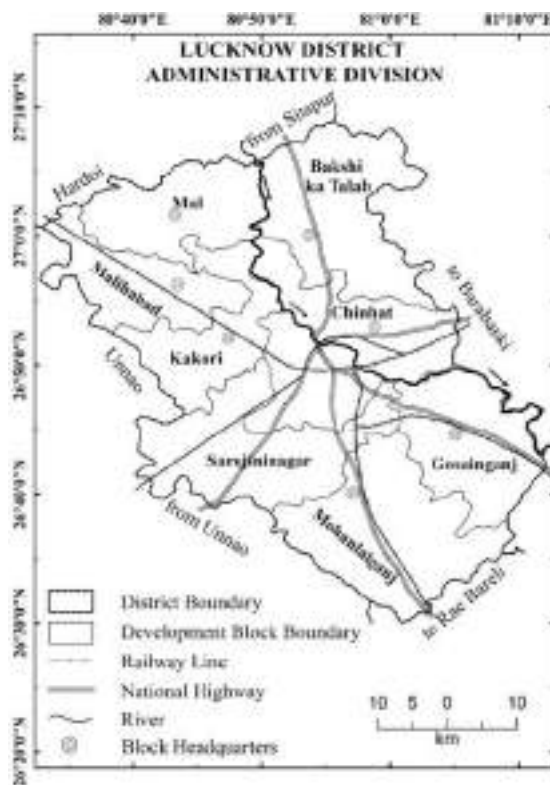

Figure 1: Administrative divisions of the study area

Figure 2: Gender Literacy Rate and Gap in Lucknow, 2011

population comprising 52.17 and 47.83 per cent respectively. With an urban population of 66.2 per cent, it is one of the highly urbanised district in the state. Sex ratio was 917 females per 1000 males in 2011 which is significantly lower than national average (943) but higher than the state average (912). The sex ratio in urban areas of the district (923) was higher than that of rural areas (906).

The overall literacy rate of the district is 77.3 per cent with the male literacy being 82.6 per cent as against 71.5 per cent of female literacy, the gap in male-female literacy rate at district level is 11.1 percentage points. The literacy rate in rural areas was 67.8 per cent (males 76.4 per cent, females 58.3 per cent) and 81.9 per cent in urban areas (males 85.6 per cent, females 77.9 per cent), these figure reveals that the gender gap in literacy is much lower in urban areas (7.7 per cent) compared to rural villages (18.1 per cent) of the district. Rapidly growing population is accompanied with increasing illiterate population especially rural females. Though the district has made steady progress in literacy achievement and gap between male and female literacy has considerably declined, but more has to be done to achieve spatial and gender equality in literacy. Literacy rate and gender literacy gap in Lucknow district for rural-urban population is represented by Figure 2 and block-wise

Figure3: Block-wise Gender Literacy Gap in Lucknow

gender gap in literacy is shown by Figure 3.

Database and methodology

The present research paper is based on secondary sources of data obtained mainly from the Census of India 2011, District Census Handbook of Lucknow 2011: Village and Town Directory &Primary Census Abstract (PCA) and other relevant literatures. Web sources were also visited to get authentic literature and figures. Blocks are taken as unit of analysis comprising of both rural villages and urban towns. The block-wise data for 2011 Census on literate population and literacy rate are available and some are calculated from secondary sources using simple arithmetic calculation. The paper uses percentage value of total literate population i.e. literacy rate for subsequent measurements.

The collected data has been further classified and processed using statistical techniques and relevant GIS software. Base map representing the block division of district Lucknow is prepared and digitized on GIS software with the help of source maps taken from Survey of India.Tabulation and graphical representation of data is done with the help of word processing and spreadsheet applications. Spatial distribution of disparity among blocks is represented through maps, on the basis of which a systematic empirical analysis has been presented.

To measure gender disparity in literacy & analysing its regional pattern, the methodology adopted includes the use of disparity and differential Indexes along with gap analysis. Sopher's Disparity Index (Sopher, D.V., 1972) is used for calculating relative disparity. According to this method, if X1 and X2 represent the respective percentage value of variables of group 1 and 2, then the disparity index (SDI) is calculated using the following expression:
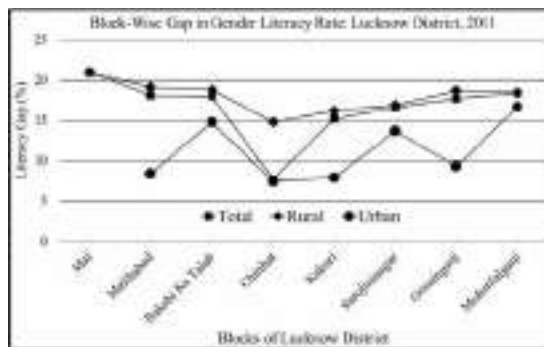
SDI= log(X2/X1) + log {(Q- X1)/(Q- X2)}

Where:X2 > or = X1 and Q =100

Here, group 2 is taken for the variable having comparatively higher value than the variables of group 1. In case of perfect equality i.e. no disparity between two groups, the value of SDI will be 0. This method reveals that greater the value of SDI, higher the extent of disparity and lower the value of SDI, lesser will be the disparity.

Male-Female Differential Index (MFDI) is also used for accurately depicting the differences between male-female literacy in proportion to total literacy.This index is calculated as:

MFDI= (MLR-FLR)/TLR

Where:MLR= Male Literacy Rate, FLR= Female Literacy Rate, TLR= Total Literacy Rate.

A Composite Male-Female Disparity-Dif-ferential Index (DDI) is then calculated by adding the SDI & MFDI values of respective units (blocks) for comparing, analysing & mapping gender disparity in terms of rural-urban differentials.

Results and discussion

The level of literacy in study region differs from block to block due to multiple factors, chiefly among them are locality (rural or urban), relative proximity to main city, quality of primary schools, outreach of government programmes, awareness, historical legacy & other human influences. Study area is devoid of irregular relief and disruptions, so physical factors are assumed to have negligible role in affecting literacy levels.

Overall literacy and spatial patterns of literacy gap

As per Census of India 2011, 77.3 per cent of population was literate with the male and fe-

Table 1: Block-Wise Disparity in Total Literacy, 2011

Sl. No.	Name of the Block	Literacy Rate (L.R.)) (%) (2011)			Gap in Male-Female L.R. (%)	Sopher's Disparity Index (SDI)	Male-Female Differential Index (MFDI)	Disparity-Differential Index (DDI)
A	B	C	D	E	F (D-E)	G	H	I (G+H)
		Persons	Males	Females				
1	Mal	64.3	74.3	53.3	21.0	0.40	0.33	0.73
2	Malihabad	66.0	74.6	56.5	18.1	0.35	0.27	0.62
3	Bakshi Ka Talab	68.1	76.7	58.7	18.0	0.36	0.26	0.62
4	Chinhat	82.2	85.9	78.2	7.7	0.23	0.09	0.32
5	Kakori	66.6	73.8	58.6	15.2	0.30	0.23	0.53
6	Sarojaninagar	73.2	81.1	64.5	16.6	0.37	0.23	0.60
7	Gosainganj	64.3	72.9	55.2	17.7	0.34	0.28	0.62
8	Mohanlalganj	67.8	76.5	58.1	18.4	0.37	0.27	0.64
	District (Total)	77.3	82.6	71.5	11.1	0.28	0.14	0.42

Source: District Census Handbook of Lucknow, 2011

male literacy being 82.6 per cent and 71.5 per cent respectively, these figures clearly indicates that literacy rate of district Lucknow is at a fairly good level, but it is not without rural and urban variations. Table 1, 2 and 3 shows the block-wise literacy achievement among male-female population, subsequent gender gap (column F of respective tables) and gender disparity (column I of respective tables) for total, rural and urban population of these blocks respectively. Graphically this literacy gap is represented by Figure2, and regional patterns of the same is depicted through Figure3. The figure reveals that rural literacy gap is highest in every block ranging from 21 per cent in Mal block to 14.7 per cent in Chinhat block, the highest & lowest gap registered in urban blocks were 16.7 per cent in Mohanlalganj and 7.4 per cent in Chinhat respectively, so it can be summarised that rural areas are more prone to gender literacy varia-

tions, though a simple gap analysis is not entirely adequate to highlight actual disparity, therefore following attempt has been made to analyse gender literacy variations by taking disparity-differential index.

Spatial patterns of gender disparity in literacy

For assessment of block-wise disparity, composite disparity-differential index is used and the whole study region is grouped into 4 disparity classes of low, medium, high and very high (Table 4). These classes helps in identifying the spatial patterns of gender disparity in literacy taking into account rural and urban population of the blocks thereby facilitating comparative analysis. It should be noted that average gender disparity in literacy of total, rural and urban population in Lucknow district corresponded to medium (0.42), high (0.63) and low (0.32) disparity class respectively. Spatial distribution of

Table 2: Block-Wise Disparity in Rural Literacy, 2011

Sl. No.	Name of the Block	Literacy Rate (L.R.) (%) (2011)			Gap in Male-Female L.R. (%)	Sopher's Disparity Index (SDI)	Male-Female Differential Index (MFDI)	Disparity-Differential Index (DDI)
A	B	C	D	E	F (D-E)	G	H	I (G+H)
		Persons	Males	Females				
1	Mal	64.3	74.3	53.3	21.0	0.40	0.33	0.73
2	Malihabad	65.7	74.7	55.6	19.1	0.37	0.29	0.66
3	Bakshi KaTalab	67.1	76.0	57.2	18.8	0.37	0.28	0.65
4	Chinhat	73.5	80.5	65.8	14.7	0.33	0.20	0.53
5	Kakori	66.8	74.4	58.2	16.2	0.32	0.24	0.56
6	Sarojaninagar	73.0	81.1	64.1	16.9	0.38	0.23	0.61
7	Gosainganj	64.3	73.3	54.6	18.7	0.36	0.29	0.65
8	Mohanlalganj	68.1	76.7	58.3	18.4	0.37	0.27	0.64
	District (Rural)	67.8	76.4	58.3	18.1	0.36	0.27	0.63

Source: District Census Handbook of Lucknow, 2011

gender disparity in literacy among blocks of Lucknow district for total, rural and urban population is represented by Figure 4, 5 and 6 respectively.

Regions of low disparity (below 0.40)

Considering total population, only one block Chinhat (0.32) was found to be having low disparity (Figure 4) which can be attributed to its high urban population and availability of educational infrastructure etc. This block spatially corresponds to Lucknow city and agglomeration. The literacy gap in Chinhat was also observed to be the lowest among all categories i.e. 7.7 per cent. In rural areas, no block reported low disparity in literacy partly due to socio-economic backwardness and agricultural distress. Urban migration of literate people also contributes to general low literacy and non-occurrence of low disparity. In urban areas, 4 blocks of Malihabad

(0.29), Chinhat (0.31), Kakori (0.27) and Gosainganj (0.32) reported low disparity in gender literacy. It was observed that urban areas of district had lower disparity than rural areas.

Regions of medium disparity (0.40 - 0.55)

Kakori (0.53) and Chinhat (0.53) reported medium disparity when considering total and rural population of blocks respectively. Existence of only 1 rural block in low and medium disparity class proves that disparity in literacy is primarily concentrated at higher levels in these areas. In case of urban population, only 2 blocks of Bakshi kaTalab (0.53) and Sarojaninagar (0.50) were found to be in this class. It is interesting to point out that blocks having medium disparity had values of disparity-differential index in the vicinity of high disparity, meaning that general direction of gender disparity slants towards higher level in the district.

Table 3: Block-Wise Disparity in Urban Literacy, 2011

Sl. No.	Name of the Block	Literacy Rate (L.R.) (%) (2011)			Gap in Male-Female L.R. (%)	Sopher's Disparity Index (SDI)	Male-Female Differential Index (MFDI)	Disparity-Differential Index (DDI)
A	B	C	D	E	F (D-E)	G	H	I (G+H)
		Persons	Males	Females				
1	Mal	-	-	-	-	-	-	-
2	Malihabad	69.4	73.4	65.0	8.4	0.17	0.12	0.29
3	Bakshi KaTalab	72.1	79.1	64.3	14.8	0.32	0.21	0.53
4	Chinhat	82.6	86.1	78.7	7.4	0.22	0.09	0.31
5	Kakori	65.4	69.2	61.3	7.9	0.15	0.12	0.27
6	Sarojaninagar	75.1	81.7	68.0	13.7	0.32	0.18	0.50
7	Gosainganj	64.3	69.3	60.0	9.3	0.18	0.14	0.32
8	Mohanlalganj	62.3	70.4	53.7	16.7	0.31	0.27	0.58
	District(Urban)	81.9	85.6	77.9	7.7	0.23	0.09	0.32

Source: District Census Handbook of Lucknow, 2011

Table 4: Classes of Gender Disparity

Classes of Disparity	Literacy Disparity Range based on DDI	Total Literacy		Rural Literacy		Urban Literacy	
		Blocks	%	Blocks	%	Blocks	%
Low	Below 0.40	Chinhat	12.5	-	-	Malihabad, Chinhat, Kakori, Gosainganj	57.1
Medium	0.40 - 0.55	Kakori	12.5	Chinhat	12.5	Bakshi ka Talab, Sarojaninagar	28.6
High	0.55 - 0.70	Malihabad, Bakshi kaTalab, Sarojaninagar, Gosainganj, Mohanlalganj	62.5	Malihabad, Bakshi ka Talab, Kakori, Sarojaninagar, Gosainganj, Mohanlalganj	75.0	Mohanlalganj	14.3
Very high	0.70 & above	Mal	12.5	Mal	12.5	-	-

Source: Calculated fromDistrict Census Handbook of Lucknow, 2011

Regions of high disparity (0.55 - 0.70)

Maximum blocks (12) were observed to be having high disparity in gender literacy throughout the district. In the case of total population, 5 blocks were found to be falling under high category which included Malihabad (0.62), Bakshi ka talab (0.62), Sarojaninagar (0.60), Gosainganj (0.62) and Mohanlalganj (0.64). All these blocks along with Kakori also reported high disparity when taking rural literacy into account. Among urban population, only Mohanlalganjblock (0.58) exhibited high disparity. The average gender disparity in literacy of rural population also belonged to this class (Table 2).

Regions of very high disparity (0.70 & above)

Mal block(0.73) belonged to this category of extreme gender disparity of literacy (Figure 4 and 5). Mal block reported very high disparity due to lowest female literacy, relative remoteness from main city, presence of similarly underdeveloped surrounding rural towns, absence of urban population and general out-migration etc. No urban block of the district corresponded to this class.

The average gender disparity of literacy in rural areas (0.63) is nearly double than the disparity existing in urban areas (0.32). This remarkable variation shows rural-urban divide, existence of gender bias and shortcomings in existing primary educational facilities.All blocks of Lucknow district has a very peculiar location as each borders one or more neighbouring district which influence their respective socio-economic development. Proximity to Lucknow city and urban representation also results in differ-
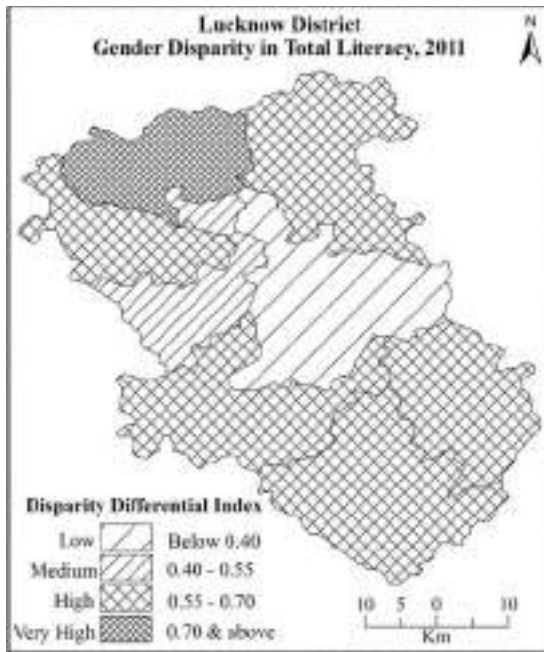
Figure 4: Spatial Patterns of Gender Disparity
in Total Literacy, 2011

ential literacy levels in these blocks. In general, Mal and Mohanlalganj blocks were having highest disparity on the account of low literacy and large gap in male-female literacy rate. Predominantly rural blocks of Malihabad, Kakori and Gosainganj also exhibited similar literacy trends and high gender disparity.

Chinhat block was the only spatial unit to show acceptable level of disparity due to dominance of urban population. So, patterns of literacy achievement and consequent gender disparities in the district are primarily the result of rural-urban nature of the blocks. Total literacy rate of the district is respectable (77.3 per cent) and disparity in gender literacy is at a medium level (0.42) because higher urban population contributes positively, but urban areas are localised and geographical variations are much wider when rural-urban differentials are taken into account. It is evident from the discussion that disparities observed in rural population is

much higher than its urban counterpart, rural blocks have comparatively lower level of male and female literacy, higher literacy gap (10.4 per cent more gap) and a significantly higher disparity-differential index than urban blocks.

On the basis of available literature and knowledge of study area, major factors responsible for this scenario of literacy disparity can be identified. Some of these factors are urban-rural representation, proximity to core urban centre, socio-economic status, migration and availability of educational amenities. Coordination among representative bodies and district administration is important for providing equitable facilities to the needful. General measures to improve gender literacy level includes family planning, support to girl child, stringent laws for those denying universal education to children, eradication of child labour, poverty alleviation, removal of prejudices and exploitation against
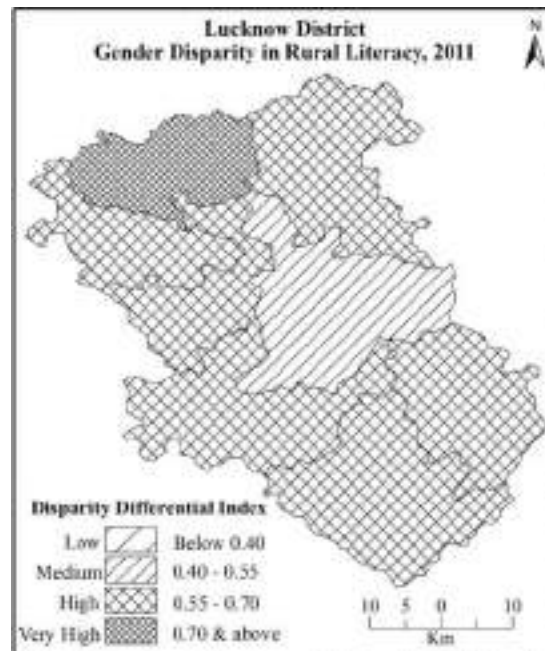

Figure 5: Spatial Patterns of Gender Disparity
in Rural Literacy, 2011

girls and backward classes among others.

Conclusion

Disparities in literacy levels highlights fundamental deficiencies in our education system and general society. The significant difference observed in gender literacy and disparity when considering rural-urban differentials is equally noteworthy and a vital area of concern going forward, because shortfall in gender literacy can result in numerous unwanted societal evils. This study presents empirical analysis of gender disparity in literacy existing in Lucknow district at both rural and urban level taking literacy data and relevant disparity indexes. Overall literacy in the district is at respectable level. Lowest literacy of 64.3 per cent was observed in Mal and Gosainganj blocks of the district. Literacy among females in rural areas went as low as 53.3 per cent for Mal block, while Gosainganj block displayed lowest male literacy in the district. Mal

Figure 6: Spatial Patterns of Gender Disparity in Urban Literacy, 2011

block also had the largest gap in gender literacy at 21.0 per cent, while urban dominated Chinhat block recorded smallest gap of only 7.7 per cent. Average rural literacy gap was massive at 18.1 per cent compared to only 7.7 per cent recorded in urban areas of these respective blocks.

Spatial patterns of disparities were grouped into 4 categories based on calculated disparity differential index. It was observed that maximum rural blocks displayed high to very high gender disparity in literacy, while maximum urban blocks were having low to medium disparity. This data can be correlated to rural-urban divide and influence of urbanisation in the district as urban areas within administrative blocks had more socio-educational amenities than their rural counterparts. As many as 6 rural blocks had gender disparity in high category (0.55 - 0.70). Mal block displayed highest disparity of 0.73. Mal and Mohanlalganj blocks are most deficient areas of literacy partly due to its remote north-south location and rural characteristics. Only Chinhat and Sarojininagar blocks were found to be having acceptable gender literacy levels, while Kakori's relatively lower disparity was the result of its stagnating literacy at sub 70 per cent level and not due to higher literacy equality.

Based on literature reviewed and spatial conditions of literacy (disparities) in Lucknow district, the study suggests measures like proliferation of primary schools in villages, decentralised education system, exclusive girl school, more governmental incentive for education of girl child and backward classes, comprehensive literacy programme at district level, social reforms in rural areas, timely monitoring, poverty alleviation, positive rural-urban linkage and strict legislations for improving literacy levels and removing imbalances over geographical space. Rural-urban divide needs correction as rural areas are still plagued with traditional prejudiced practices and apathy of government. Strengthening of panchayats can be a good start
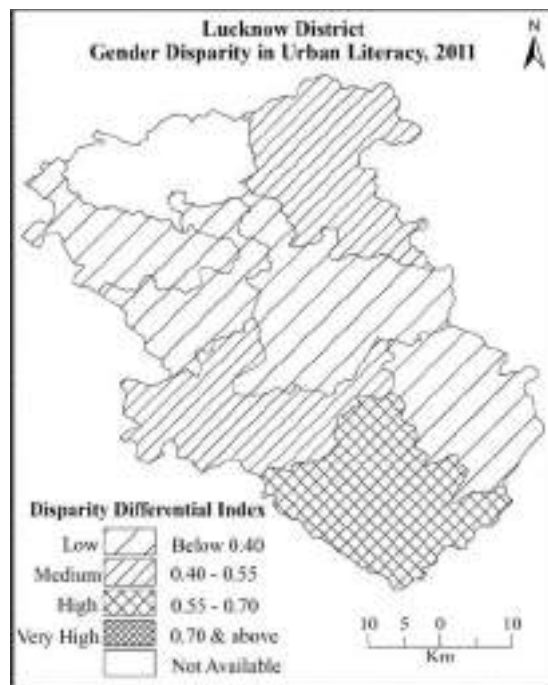
in this direction. In this regard governmental efforts along with societal participation and awareness is imperative for achieving the goal of universal literacy, inclusive socio-economic development and elimination of all types of spatial gender disparities.

References

Ali, A., 2009, Literacy in Uttar Pradesh: Spatial Dimension, *National Geographical Journal of India,* 55(I): pp. 99-110.

Bhende, A.A., and Kanitkar, T., 2015, *Principles of Population Studies*, Himalaya Publishing House, Mumbai.

Census of India, 2011, District Census Handbook: Lucknow, Series 10, Part XII-A, Village and Town Directory, Directorate of Census Operations, Uttar Pradesh.

Census of India, 2011, District Census Handbook: Lucknow, Series 10, Part XII-B, Village and Town Wise Primary Census Abstract (PCA), Directorate of Census Operations, Uttar Pradesh.

Chandna, R.C., and Sidhu, M.S., 1980, *Introduction to Population Geography*, Kalyani Publishers, New Delhi.

GOI Schemes, 2015, Government of India, Ministry of Human Resource Development, available at http://mhrd.gov.in/schemes/ assessed on 20/07/2018.

Grover, R.P., and Bhardwaj, R., 2002, Gender inequity in literacy in Haryana: An analysis, *Indian Journal of Adult Education,* 63(4).

Jhariya, G.P., and Jain, C.K., 2014, Pattern and Differential of Literacy in Madhya Pradesh, *Journal of Humanities and Social Science,* 19(9): pp. 77-84.

Joshi, H., 1999, Spatial Variation in Crude Literacy Development Index (Raj.) 1991, *Transactions,* 21(1): pp. 23-44.

Katiyar, S.P., 2016, Gender Disparity in Literacy in India, *Social Change*, 46(1): pp.46-69.

Kumar, N., Kumar, N., and Rani, R., 2016, Gender Disparity in Literacy: Districts Level Evidence from Selected States of India, *Educational Quest: An International Journal of Education and Applied Social Sciences,* 7(3): pp. 243-254.

Krishan, G., and Shyam, M., 1978, Regional Aspects of Urban-Rural Differential in Literacy in India: 1971, *The Journal of Developing Areas,* 13(1): pp. 11-21.

Majumdar, P., 1999, Spatial pattern of Literacy in West Bengal: A District Wise Analysis of 1991 census, *Geographical Review of India*, 61(2): pp. 165-172.

Mundhe, N.N., Pawar, D.B., and Rokade, P.D., 2017, Use of Disparity Index for Identifying Rural - Urban Literacy Pattern of Pune District, Maharashtra, *IMPACT:International Journal of Research in Humanities, Arts and Literature (IJRHAL),* 5(8): pp. 61-70..

Nayak, L.T., 2011, Gender Disparities in the Levels of Literacy Rate in Karnataka: A District Level Analysis, *Geographical Review of India*, 73(3): pp. 239-256.

Pagar, S.D., 2016, Geographical Analysis of Literacy in the Nashik District of *Maharashtra, Maharashtr Bhugolshastra Sanshodhan Patrika,* 33(1): pp. 73-83.

Patel, I., and Dighe, A., 1997, Gender Issues in Literacy Education, Working Paper 108, Institute of Rural Management.

Rao, D.P., 2009, Disparity in Literacy Rate in India: An Urban-Rural Perspective, *Nagarlok,* XLI (2): pp. 13-23.

Sawant, S.B., andAthavale, A.S., 1994, *Population Geography*, Mehta Publication, Pune.

Sawant, M.N., and Lewis, C., 2004, Literacy in Goa: A Spatio-Temporal Review, *The Goa Geographer,* 2(2): pp. 32-41.

Siddiqui, S., 2011, Regional Analysis of Urban Rural differentials in literacy of employment in Uttar Pradesh, India, *Journal of Geography and Regional Planning,* 4(5): pp. 287-296.

Som, K.S., and Mishra, R.P., 2014, "Literacy and Their Differential in West Bengal" *International Journal of Science and Research,* 3(6): pp. 1537-1545.

Sopher, D.E., 1980, Sex disparity in Indian literacy, In D.E. Sopher (ed.), *An exploration of India: Geographical perspectives on society and culture*, Cornell University Press, New York: pp.130-188.

Sopher, D.E., 1974, A Measure of Disparity, *The Professional Geographer,* 26(4): pp.389-392.

United Nations Development Programme, 2014, Hu-

A Review of Rural Development and Poverty Amelioration Programmes in Niyamatabad Block, District Chandauli

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Abstract

Poverty is chronic and multi-dimensional in nature in India. It is concentrated in the rural areas of certain states as well as in certain social groups. Rural poor have identifiable occupational structure concentrating specially in agricultural labour and artisanal households group in rural areas. Rural poverty is now multiplied with the population explosion and unemployment situation. A number of rural development programmes has been launched in the Five Years Plans to raise income, provide employment, make masses literate and alleviate the poverty of rural poor in the country. This paper evaluates different rural development programmes implemented in the study area.

Keywords : rural development, poverty, poverty amelioration programmes, panchayati raj, local level planning, socio-economic achievements, participatory planning.

Introduction

The concept of poverty not only includes physiological aspects such as non-fulfillment of basic material or biological needs but also social aspects like, lack of autonomy, powerlessness, lack of self-respect/dignity, etc. Now, inequality and its relationship to poverty have re-emerged as a central concern in the poverty studies. Poverty is a state wherein an individual cannot satisfy his minimum wants for reasonable healthy living in a given social environment. It indicates a condition in which a person fails to maintain a living standard adequate for his physical and mental efficiency. Poverty is the outcome of low income induced by low productivity, and its unequal spatial distribution. Rural poverty is very much in India having increasing trend parallel to population explosion after independence. 'Poverty reduction has been one of the major goals of development planning since independence and the planning process has been sensitive to the needs of the poor. Accordingly, the development efforts have been directed in creating adequate livelihoods and provision of services for a better quality life for the poor. Poverty in India is not merely an economic phenomenon but a social one as well. While poverty is an outcome of multiple deprivations, the measurement has largely dealt with economic deprivation (income/consumption expenditure). The recent literatures highlight the multidimensionality of poverty and also the heterogeneity of the poor. It also high-

lights the need to go beyond income poverty by using indices of human development and overall welfare. Poverty is not simply a matter of inadequate income but also a matter of low literacy, short life expectation and lack of basic needs such as drinking water. Human Poverty concept of UNDP highlights essentially the deprivations in health, education and income. Gender inequality adjusted human development indices are helpful to trace the group and region specific disadvantages and for initiating appropriate remedial measures. Since these deprivations are inter-related, a comprehensive approach alone can eliminate poverty and ensure optimal utilization of human resources for sustainable development. Furthermore, the recent empirical research highlights the nature of hardcore poverty in India. Thus, multi-pronged and convergent approaches with proper targeting are deemed essential for elimination of poverty' (Planning Commission, 2006). Instead of severe hunger and starvation, poverty has been more relative with the increasing gap between rich and poor in recent years (Tiwari, P.K. 1994). India's poverty, especially 'rural poverty', has gone so deep into the marrow of our bones that, as a nation, we have dutifully acquired the knack of living with it. Moynihan (1969) in explaining the vicious cycle of poverty argues that 'the vicious cycle, in which poverty breeds poverty, occurs through times, and transmits its effects from one generation to another. There is no beginning and no end to the cycle. The concept behind the rural development programmes for poverty alleviation is basically to mobilize the human as well as rural resources for the national development. Providing minimum need to the rural poor push them to break the vicious cycle of poverty and contribute their human power for the regional development. The concept is also behind the programmes to enhance the rural employment condition maintenance of social justice and participation of beneficiaries in the implementation of the development programmes.

'Rural development' earlier implied agricultural development and community development enveloping the entire population of rural areas as a part of modernization of the underdeveloped and backward areas. In the context of modernization of the entire society, it means, development which affects the entire population of rural areas enveloping all facets of transformation of rural India as a part of socio-economic growth. This was the dominant view of rural development till the late fifties but has undergone a sea of change since then. As the World Bank (1975) points out, 'rural development is a strategy designed to improve the economic and social life of a specific group of people-the rural poor. It involves extending the benefits of development to the poorest among those who seek a livelihood in the rural areas. The 'group' includes small-scale farmers, tenants and the landless'.

The new stance appeared in India is 'Garibi Hatao'. It was adopted to prevent some of the rural poor from plunging deeper and deeper into the bottomless levels of primary poverty and increasingly finding fewer avenues of livelihood and purchasing power in the context of the path of development. It is necessary to draw attention to the implication of this strategy of the rulers in approaching the rural poor, in the name of rural development as differently defined. This shift in strategy enables the state to evolve various tactical programmes and pragmatic policies to appease selected fragments of the poor temporarily to divide them, by specific relief measures by choosing selectively target groups from the rural poor to serve the basic interests of the rulers with a view to diffuse and fragment the rising upsurge of the various segments of the rural poor (Tiwari, 1994). To counteract these assertion and struggles the government evolved a two-pronged strategy (i) smothering and sup-

pressing the assertions of the poor on a larger and more brutal scale and (ii) evolving schemes comprising specific measures under the new rubric characterized as 'rural development'. The main purposes of the new strategy of rural development were (a) To assuage-a-small section of the poor selectively chosen and through a few crumbs of relief of them and (b) To prevent a small section of the middle and small operating in dry farming areas from being pauperized further and making them productive by providing a variety of specially worked out assistance and support and thereby, absorb them into the mainstream as it is called, of development (Desai, 1987). It is vital that all those concerned with the poor and particularly with rural poor should realize the necessity to comprehend this double-pronged strategy of increasing assault against the assertions of poor, by suppressing the human rights of the rural poor, with greater and ever growing ferocity and the strategy of selective appeasement and relief by throwing a few crumbs to the rural poor, now designated as 'rural development' or sometimes as 'integrated rural development as dialectically interconnected, i.e., two facts of the new strategy by the state, which is determined to pursue capitalist path of development, in the changed context of both the national and international situation since mid-sixties (Desai, 1987).

A number of studies have been done regarding poverty alleviation and rural development. Thakur, Bose, Hossain and Janaiah (2000) analyzed rural poverty and income distribution based on an intensive survey of eight villages representing all agro-ecological regions of Bihar. Fan, Peter and Thorat (2000) have argued that, to reduce rural poverty, the Indian government should give highest priority to additional investment in rural infrastructure. Ray (2000) has investigated that the backward classes and female headed household have higher poverty rules than others. Vaidyanathan (2001) discussed

some important issues concerning concepts and measurement of poverty as well as the design and implementation of policies. Deeton and Dreze (2002) presented a new set of integrated poverty and inequality estimates for India and Indian states. Rath (2003) introduced the basic methodology of the Planning Commission to define poverty line in Bihar. Kumar and Aggarwal (2003) determined the extent of poverty in Delhi slums through consumption patterns, employment and educational states of the slum population. Beteille (2003) stated that the study of both poverty and inequality has been closely associated with an interest in economic and social change. Krishna, Kapila, Porwal and Singh (2003) searched out that reasons for falling into poverty will need to be tackled separately through suitable public policies and appropriate non-government actions. Peter and Shariff (2004) searched out that the direct contribution of the non form sector to poverty reduction is possibly quite muted as the poor lack assets, but it has been found that the growth of certain non-form sub-sectors is strongly associated with higher agricultural wage rates. Sundaram and Tendulkar (2004) estimated the poor in the Indian labour force of 1990s. Bardhan and Mukherjee (2004) examined poverty alleviation effects of West Bengal panchayats comprising implementation of land reforms and pro-poor targeting of credit, agricultural mini-kits of employment programmes and fiscal grants. Nayyar (2005) analyzed the effect of policies and institutions on poverty reducing impact of growth. Laxmi Lingam (2006) reviewed the relation among gender, households and poverty indicating our understanding of gender and gender relations Thomas Pogge and Reddy (2006) suggested that a new methodology of global poverty assessment feasible is necessary. Barbara (2006) discussed to mitigate poverty through social transfer. He added that it is not possible to eradicate the processes that create poverty

under capitalism. He also suggested ways to regulate these processes and to protect against their impact. Martha, Joann and James (2006) argued that there is a need to reorient economic policies to promote more and better employment in order to reduce poverty. Murti and Soumya (2007) stated that the increase in income will lead to reduction in poverty in rural India. Werhane (2009) argued that poverty can be reduced, if not eradicated, both locally and globally, but this will occur only if we change our shared narratives about global free enterprise, and only if we recalibrate our mindsets regarding how poverty issues are most effectively addressed. Olayinka (2010) examined early life education for under-fives as a means of economic empowerment of mothers and sustainable poverty amelioration. This paper critically evaluates different rural development programmes implemented in the Niyamatabad Community Development Block, District Chandauli (U.P.).

The study area

Niyamatabad Community Development Block (25o 11' - 25o 20' N and 83o 30" - 83o 12' 30" E) is a part of Chandauli district since 2001 which was itself separated from Varanasi district in 1952. The river Ganga marks the boundary between Varanasi and Chandauli districts. Niyamatabad block lies on the right bank of river Ganga flowing in Chandauli district, which consists of 138 revenue villages (Fig.1) and one urban area (Mughalsarai). Niyamatabad block lies in the Middle Ganga Plain, more precisely in the Ganga Khadar of the Ganga-Son Doab, characterized by almost a levelled and uniform topography with a slight undulation caused by river tributaries and other water bodies (Tals). The area is made of thick alluvium deposits that are generally 'free from stones and pebbles'. The local variations in relief occur only due to run off by seasonal tributaries (Nala such as Garai Nadi and others). The general slope of the block

is from south to north and east to west towards 'Ganga Arc'. The south-eastern part is drained by Garai Nadi which joins the Karamnasa river and, finally, falls in the Ganga in the east. The 80 meters contour crosses the southern half of the block and 60 meters contour lies in the northern part of block along the Ganga River. Niyamatabad Block is completely drained by river Ganga. A few nalas, especially Garai drains the south-eastern part of the block which joins the Karamnasa River, while the rest of the block is drained by nalas directly flowing in Ganga. The garden and groves with some other vegetation orchards may be seen having different types of trees. The significance of the trees is mostly for their fruits, fuel and timber. The fuelwood is the second important source of rural energy for domestic purpose after cow and buffalo dung. Therefore, the continuous depletion of garden and orchards needs the implementation and success of social forestry.

Data sources methodology

The study presents a brief review of poverty alleviation and rural development programmes launched by the Government in Niyamatabad block exposing the current status of the implemented programems at first. Socio-economic achievements of the blocks during the plan periods have been also explored at the second step. The data and literature has been collected from different sources like different offices of Government of India, Planning Commission, District Development Offices, Block Development Offices, District Statistical Book, India Year Book etc. and personal survey of different villages of the study area. Industrial and infrastructural including socio-economic facilities have been obtained from the Office of Directorate of Census Operations (Lucknow), Tahsil Office (Chandauli), District Industry Centre (Chandauli), and Block Development Office (Alinagar), respectively. Also, some published and unpublished informations are collected from
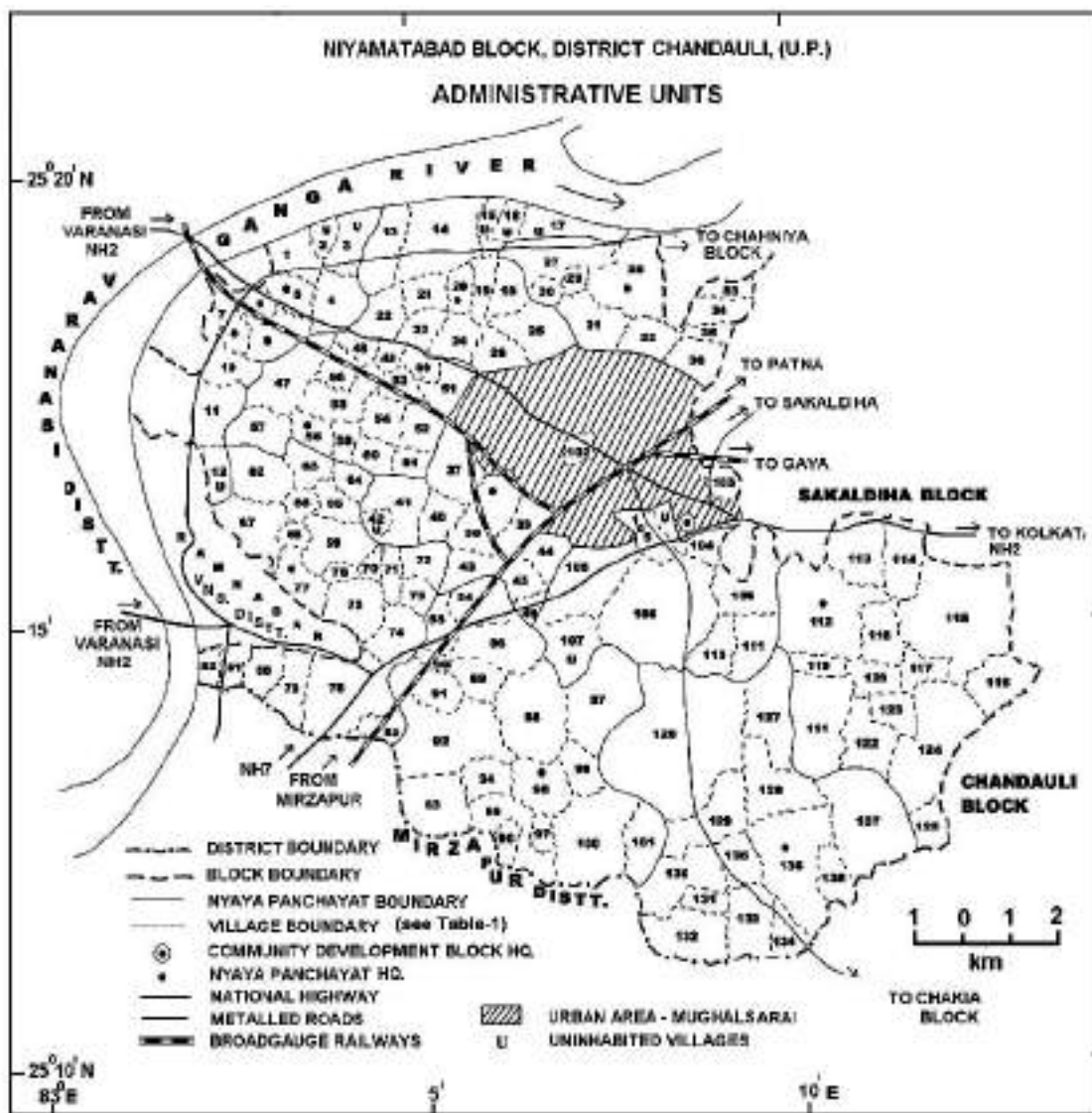
Figure 1: Location and extent of study area

various government agencies, such as District Economic and Statistical Office (Chandauli), District Planning Office (Chandauli), Department of Irrigation (Chandauli), Electricity Board Office (Chandauli), etc. Besides, a lot of information and literature are consulted from the different libraries and web sources.

Rural development and poverty amelioration programmes

The rural development programmes were started, at first, under the Panchayati Raj Administration in the block after independence which mainly emphasized on the establishment of Panchayat Bhavan for the official use with the help of partial grant received by the govern-

ment. Construction of Gandhi-Chabutara in almost every Gram Sabha for the general meetings of the village, construction of bridges and approach roads in village and improvement in sanitation by constructing nala and drains were other priorities. To initiate a process of all round balanced development which would ensure a rise in national income and a steady improvement in living standard over a period were the twin objectives of the First Five Year Plan in the country which were also implemented in the block. The implementation of a Community Development Programme (1952) along with the National Extension Service (1953) focused on people's participation and the reintroduction of Panchayati Raj, abolition of Zamindari and Jagirdari and other land reform measures. Keeping the 'rural weak' and the 'rural poor' in the centre, the programmes emphasized the development not merely in agricultural production but also in the fields of village sanitation, public health, education, cooperation, youth women and child welfare etc. Its main objectives were to bring about a change in the mental outlook of the people, instill in them an ambition for higher standards of life and the will and determination to work for such standards. It seeks to 'build up the community and the individual, a builder of his own village and of the country in the larger sense'. Such programmes were followed since First Five Year Plan during which Community Development Blocks were introduced as a basic local level planning unit in 1952. Under this scheme, many programmes were started like Well Construction and repair works, construction of metallic roads, village link roads, sanitation etc. These programmes were run with the help of government's subsidy.

The basic objectives of the Second Five Year Plan (1955-61) have been summed up in the phrase 'socialist pattern of society'. Essentially this means that the basic criterion for determining the lines of advance must not be provided profit but social gain, and that the pattern of development and the structure of socio economic relations should be so planned that they result not only in appreciable increase in national income and employment but also in greater equality in national incomes and wealth. It was suggested that employment opportunities would be provided to the labour force to remove under-employment in agriculture and the village and small scale industries (Planning Commission, 1956). The implemented programmes (Table-1) for the benefit of the rural poor and the rural weak continued with higher resource allocations and greater coverage. During the Second Five Year Plan, under the agricultural reform for plant protection, the 'Satyanashi Vinashi' programme has been implemented in the block to clean the 'Bharbhar' plant. Also, the improvement in agricultural inputs and farm technology were introduced by adopting the fertilizers, HYV seeds, Diblar and iron plough etc. More emphasis was given to use the compost as well as green- manures by the government through village-level demonstrations.

The basic objective of development programmes launched during the Third Five Year Plan was to provide opportunities to the masses to lead a good life by combating the course of poverty, with all the ills that it produces and it is recognized that this can only be done through socio-economic advance, so as to build up a technologically mature society and a social order which offers 'equal opportunities' to all citizens. The first condition for securing equality of opportunity and achieving a national minimum is assurance of gainful employment for everyone who seeks work (Planning Commission, 1961). The Third Five Year Plan had also the thrust on intensive agriculture in which, besides the use of fertilizers, HYV seeds and improved farming techniques, methods use of new agricultural equipments like iron plough, singh-ho, diblar, hand-ho etc. were also included. In this block,

Well Construction and Farmers Training Programme were implemented in 1966-67. In 1968-69, the Test-Work Programme was started under Rural Manpower Programme in which road construction and leveling of undulating lands were followed (Table-1).

The major focus of the Fourth Five Year Plan (1969-74) was aimed to promote equality and social justice attaining of economic self-reliance with adequate growth rate and the acceleration of the progress towards a socialist society through the provisions of employment and education. The plan aimed at ensuring better standard of living for the people by enlarging the income, supplies of food articles, agricultural raw materials, agricultural production, reducing the growth rate of population and the development of human resources by providing substantial additional facilities in the social service sector, especially for the rural areas. In the plan it was proposed that per capita income would go up from Rs. 448/- in 964-65 to Rs. 532/- in 1970-71 i.e., by 3 per cent (compound) per annum (Planning Commission, 1966). A number of schemes related to 'area development programmes' and 'family beneficiary programmes' with specified target groups and identified under-developed and backward areas were taken up. Drought-Prone Area Programme (DPAP) and Crash-Scheme for Rural Employment were implemented in the Fourth Five Year Plan (Table-1). Besides Bandhi (small and narrow dam) Construction, Village Link-Roads were constructed to give employment to rural people. The small farmers were provided the modem agricultural equipments, fertilizers and livestock through the block development authorities.

The principal objective of the programme for the development of different small industries in the Fifth Five Year Plan (1974- 79) was to facilitate the attainment of some of the major task for, the removal of poverty and inequality in consumption standards of the people concentrated' in rural and backward areas through the creation of large scale opportunities for fuller and additional productive employment and improvement of their skills so as to improve their level of earnings (Planning Commission,, 1974). During the Fifth Five Year Plan, the new schemes were started like 'Food for Work' through the construction of non-metallic roads, irrigation facilities etc. In 1979, SFDA, DPAP and 'Antyodaya' Programmes were started under the IRDP. In the same year, TRYSEM Programme was introduced specially to give the training of food processing, socks-making, sweater/pullover weaving, sewing of garments etc to the rural youths (Table 1).

Poverty reduction through fuller employment of human resources was the major objective of the Sixth Five Year Plan (1980-85). This plan emphasized on (i) a progressive reduction in the incidence of poverty and unemployment (ii) improving the quality of life of the people in general with special reference to the economically and socially handicapped population, through a minimum needs programme, (iii) strengthening the redistributive bias of public policies and services in favour of the poor contributing to a reduction in inequalities of income and wealth, and (iv) a progressive reduction in regional inequalities in the pace of development and technological benefits (Planning Commission, 1980). With the beginning of Sixth Five Year Plan, 'Food for Work' programme was changed as NREP in 1980 in which a labourer was provided half of his wage in cash and half as food-cereals at the rate of Rs. 11.50 per day. Under this programme, the link roads were constructed and simultaneously many such schemes were merged during this plan (Table-1). The RLEGP Programme was started in 1983 and the Indira Housing Scheme was followed to construct the houses for the rural weaker section which was previously known as Mushahar Housing

Scheme. Under this programme, the houseless scheduled castes were provided a house constructed by the government which also provided employment as labourer in this scheme. The government spent about Rs. 10,000 as full subsidy for houseless persons in the weaker section. It also assured a full time job for the scheduled castes under the Special Component Programme. Under this programme, an amount of Rs. 10,000 for shop-making was given out of which Rs. 5,000 was subsidy and the rest might be paid in installments without interest in ten years. The government under this programme also provided a loan subsidy of Rs. 6,000 for opening of business, out of which Rs: 3,000 was subsidy and the rest was as loan at the rate of 4% interest. The Weaker Section Housing Scheme was started with a loan subsidy of Rs. 1500 in 1980 which had been raised to Rs. 3,500 in the Seventh Plan.

The development strategy of the Seventh Five Year Plan (1985-90) aimed to reduce the poverty at faster rate. It was expected that the percentage of population with a consumption standard below the poverty line would come down. In the Seventh Five Year Plan, the rural housing scheme had been provided as a loan subsidy in all categories of people like lower, medium and high income groups by the Housing Development Corporation. It had already been started in the Shujabad village. Under the IRDP, the amount of subsidy had been raised to Rs. 3,000 as minimum in rural areas. The beneficiaries of the Sixth Plan (who received the subsidy only Rs.1,500) also might avail the rest amount as under IRDP Programme. The small and marginal farmers also availed the subsidy of Rs. 3,000 under free boring schemes. These farmers also got free 'Mini Kits Packets' time to time under the Small and Marginal Farmers Productive Plan. In the irrigation sector, a subsidy of 33% to small farmers and 50% to marginal farmers were provided for pump sets un-

der Minor Irrigation Scheme. The new government decided that the Eighth Five-Year Plan would commence on 1 April 1992 and that 1990-91 and 1991-92 should be treated as separate Annual Plans in which maximization of employment and social transformation were main thrust.

The eighth plan recognized human development as the ultimate goal of planning. Employment generation, population control, literacy, education, health, the supply of drinking water and adequate food, and basic infrastructure were listed as priorities. The Eight Five-Year Plan (1992-97) aimed at an average annual growth rate of 5.6 percent with obtaining objectives of achieving the full employment condition, Primary education to all and eradicate the illiteracy between 15-35 years age group of working people, Pure drinking water and primary health care and Agricultural development and self sufficient of food cereals.

Most programs concentrate on the creation of rural wage and self-employment and basic amenities during the Ninth Five Year Plan. Many ambitious targets for poverty reduction were launched during the Ninth Five Year Plan. But, some serious problems in formulation as well as implementation were pointed. The Ninth Five-Year Plan (1997-2002) was included the provisions of safe drinking water availability, primary health service facilities, universalization of primary education, public housing assistance to shelterless poor families, nutritional support to children, connectivity of all villages and habitations and streamlining of the public distribution system with a focus on the poor. The specific objectives of the Ninth Plan included priority to agriculture and rural development with a view to generate adequate productive employment and eradication of poverty (Table 4). Swarnjayanti Gram Swarajgar Yojana, Pradhan Mantri Gram Sadak Yojana, Sampoorna Grameen Rojgar Yojana were some of the programmes.

Table-1, Poverty Amelioration and Rural Development Programmes

Plan Period	Programme
First F.Y.P. (1951-56)	Community Development Programme, National Extension Service
Second F.Y.P. (1956-61)	Khadi and Village Industries Programme, Intensive Agricultural District Programme
Third F.Y.P. (1961-66)	Intensive Agricultural Areas Programme, High Yielding Variety Programme
Annual Plan (1966-69)	Farmer's Training and Education Programme, Well Construction Programme, Rural Works Programme (RWP), Rural Manpower Programme, Composite Programme for Women & Pre-school Children
Fourth F.Y.P. (1969-74)	Drought-Prone Areas Programmes, Cash Scheme for Rural Employment, Small Farmer's Development Agency (SFDA), Minimum Needs Programme, Command Area Development Programme
Fifth F.Y.P. (1974-79)	Food-for-Work Programme, Whole Village Development Programme, Training Rural Youth for Self-employment, Integrated Rural Development Programme.
Sixth F.Y.P. (1980-85)	National Rural Employment Programme, Prime Minister's New Twenty Point Programme, Development of Women and Children in Rural Areas, Rural Land less Employment Guarantee Programme,
Seventh F.Y.P. (1985-90)	Special Livestock Breeding Programme, Small and Marginal Farmers Productive Plan, Indira Awas Yojana (IYS), Strengthening of Extension Training Centres, National Drinking Water Mission (NDWM), Jawahar Rojgar Yojana (JRY)
Annual Plans (1990-92)	Rajiv Gandhi National Drinking Water Mission (RGNDWM)
Eighth F.Y.P. (1992-97)	Member of Parliament Local Area Development Scheme (MPLADS), Prime Minister Rojgar Yojana (PMRY)
Ninth F.Y.P. (1997-2002)	Swarnjayanti Gram Swarajgar Yojana, Pradhan Mantri Gram Sadak Yojana, Sampoorna Grameen Rojgar Yojana
Tenth F.Y.P. (2002-07)	National Programme of Nutritional Support to Primary Education (NPNPSE) Mid-Day Meal (MDM), National Food for Work Programme, National Family Benefit Scheme (NFBS), National Rural Employment Guarantee Act, National Old Age Pension Scheme (NOAPS), Mahamaya Avas Yojana, Free Boring Yojana
Eleventh F.Y.P. (2007-12)	Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA), Alpsankhay Awas Yojana, Mahamaya Awas Yojana, Dr. B.R. ambedkar Boring Yojana, Janani Suraksha Yojana
Twelveth F.Y.P. (20012-17)	Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA), Alpsankhay Awas Yojana, Dr. B.R. ambedkar Boring Yojana, Janani Suraksha Yojana, Swachchh Bharat,

Source: selected programmes compiled by the author

The Tenth Five-Year Plan (2002-2007) laid emphasis on alleviation of poverty, generation of adequate employment and provision of basic minimum services such as drinking water, shelter and connectivity to all in a time bound manner. Programmes for providing self employment, generating income, imparting technology and skill up gradation training and wage employment were to harness the benefits of growth to improve the quality of life of the people by reduction in poverty ratio from 26 percent to 21 percent, growth in gainful employment literacy ratio to increase from 65 percent in 1999-2000, to 75 percent in 2007; providing potable drinking water in all villages etc. The Tenth Plan addressed the issue of poverty and the unacceptably low levels of social indicators. National Programme of Nutritional Support to Primary Education (NPNPSE), Mid-Day Meal (MDM), Hariyali, National Food for Work Programme, National Rural Employment Guarantee Act, Twenty Point Programme, Twenty Point Programme, Mahamaya Avas Yojana, Free Boring Yojana etc. were implemented in the block (Table-1).

Eleventh and Twelfth Five Year Plans constitute Panchayati Raj for decentralization of administration, updating of land records, on-line maintenance with use of modern technologies, removal of rural unrest, development of Land Markets to protect small and marginal farmers and landless agricultural workers, to prevent sale and purchase of agricultural land for non-agricultural purposes. Many programmes (Table-1) related to Panchayati Raj Institutions, Land Relations, Poverty Elimination, Rain fed Areas, Social Protection, Rural Housing, Rapid Poverty Reduction, Local Area Development are being implemented for updating of land records, removal of rural unrest, development of Land Markets to protect small and marginal farmers and landless agricultural workers, preventing sale and purchase of agricultural land for non-agri-

cultural purposes, empowering the poor and strengthening their livelihood etc. National Old Age Pension Scheme (NOAPS), National Family Benefit Scheme (NFBS), Pension for the Disabled, Pension for the Widows and National Maternity Benefit Scheme (NMBS), Indira Awaas Yojana, Integrated Wasteland Development Programme are running in the block.

Socio-economic achievement of the block

Agricultural development, industrial development, infrastructural development and enhancement in different services as well as facilities (Fig. 2 & 3) have been the evidence of implementation of different rural development programmes. The physical setting of Niyamatabad Block has not been significantly changed so far from its appearance in 1952 in Varanasi District, but, significant socio-economic changes has taken place through the implementation of different rural development and poverty amelioration programmes during plan periods. Irrigation facility is intensified by digging tube-wells. The biological and mechanical farm technologies have been used in modern spectrum. HYV seeds, use of fertilizers, chemicals and plant protection measures (pesticides, drug, etc.) are the progressive biological technology which increase the per hectare yield. However, the numbers of poultry birds are 26098 which include 17989 birds like cocks, hens and chickens in the block which is, normally, found with backward and scheduled castes as well as with Muslims. Fisheries development is a good step towards optimum utilization of surface water in the villages, particularly of ponds and tanks. About 113 villages out of 138 inhabited villages are facilitated with metallic roads which is 253 km in total. There are 11 distribution centres of HYV seeds, fertilizers and pesticides at Bahadurpur, Chanditara, Madiya, Sahjaur, Kathauri, Bharchha, Chandait, Niyamatabad, Hirdepur, Harishankerpur, and Alinagar villages; 7 agricultural service centres at Dulhipur,

Chanditara, Muhamadpur, Dandi, Jalilpur, Katesar and Pandeypur to provide services and repair helps to the farmers and 6 markets at Dulhipur, Jalilpur, Alinagar Katesar, Godhana and Pandeypur. Besides, almost every village has few small grocery shops for daily needs of village. Also, there are 3 Kashi Gramin Bank located in three different villages named, Pandeypur, Alinagar and Dulhipur, 2 branches of State Bank of India and 2 branches of Union Bank of India located in Niyamatabd, Sahupuri, Jalilpur and Jeonathpur villages. Besides, many banks are located in Mughalsarai urban area (Bank of India, State Bank of India, Allahabad bank, Punjab National Bank and Union Bank of India (at Janso Ki Marai-an exterior village) which are providing above mentioned facilities to the rural people of the block. Education facility is also developed during plan periods with the establishment of 123 primary schools, 51 middle schools, 8 Secondary Schools, 2 Senior Secondary Schools, 2 Post- Graduate Collages, 3 Adult literacy Class/Centres. 1 primary health center and 4 Primary Health Sub-Centres; 1 Allopathic and 1 Homeopathic Hospital (in Niyamatabad village); 16 Allopathic, 12 Ayurvedic, and 3 Homeopathic Dispensaries; 26 child and maternity welfare centers, 6 Maternity Home and 2 Child Welfare Centres are providing health and family planning facilities. There are also 18 private registered medical practitioners serving in the villages. About 126 villages have been electrified with a set of 14 transformers of 63 KVA, 51 transformers of 25 KVA and 3 transformers of 15 KVA and 4 transformers of 5 KVA. The total length of L.T. line is about 32.8 kms, whereas 11 KVA line are spread over 34.68 kms. Thus, the basic facilities are being improving through different rural development programmes in the block.

Conclusion

Development planning, especially at the grass-root level, can realize its full potentials only if the people are motivated and actively involved in an organized way. Participatory planning process is one by which individuals lowest in the organizational scale are enabled to have effective voice in decision making. Therefore, the present approach has been guided by the participatory planning process. About 70 per cent of the population of the Niyamatabad Block, living in mass poverty and unemployment, are increasingly seen as rural problems. Attention has been focused hereon development policies for the rural poor to create higher agricultural output and productivity, on land ownership, farm extension facilities, agricultural training and small rural industry schemes as well as on social services and facilities for the rural poor. The development of rural communities and their participation in rural development planning and processes should be ensured.

References

Andre Beteille, 2003, Poverty and Inequality, *Economic and Political Weekly* (EPW), Oct. 18, pp. 4455-4463.

Angus Deaton and Jean Dreze, 2002, Poverty and Inequality in India - A Re-Examination, *EPW, Sept.* 7, pp. 3729-3748.

Bardhan, P. and Mookherjee, D., 2004, 'Poverty Alleviation Efforts of Panchayats in West Bengal, *Economic and Political Weekly* (EPW), Feb. 28, pp. 965-973.

Bibek, Debroy and Laveesh Bhandari, 2003, *District level Deprivation in the New Millenium.*

Borbara Harriss-White, 2006, 'Poverty and Capitalism', *EPW,* April 1, 1241-1246.

Desai, A.R., 1987, 'Rural Development and Human Rights in Independent India', *Economic and Political Weekly;* Vol. XXII, No. 31, p.1291.

Economics & Statistics Division, State Planning In-

stitute, U.P., 2009, *'Sankhyikiy Patrika-2009'* Chandauli.

Fan, S., H. Peter and Thorat, S.K. (2000): 'Impact of Public Expenditure on Poverty in Rural India', *Economic and Political Weekly,* Sept. 30, pp. 3581-3588.

Gaurav Nayyar, 2005, 'Growth and Poverty in Rural India - An Analysis of Inter-State Differences, *Economic and Political Weekly, April* 16, pp. 1631-1639.

Krishna, A., Kapila, M., Porwal, M. and Singh, V., 2003, 'Falling into Poverty in a High-Growth State-Escaping Poverty and Becoming Poor in Gujarat Villages', *Economic and Political Weekly,* Dec. 6, pp. 5171-5179.

Kumar Naveen and Aggarwal S.C., 2003, Patterns of Consumption and Poverty in Delhi Slums, Economic and Political Weekly, Dec. 13, pp. 5294-5300.

Lakshmi Lingam, 2006, Gender, Households and Poverty - Tracking Mediations of Macro Adjustment Programmes, *Economic and Political Weekly,* May 20, pp. 1989-1998.

Malik, J.S. and Narwal, R.S., 2003, Theoretical Orientation of Rural Development-Tips for Planners, in Singh, S (ed.) *Strategies for Sustainable rural Development,* pp 132-133

Martha Chen, Joann Vanek and James Heintz, 2006, 'Informality, Gender and Poverty - A Global Picture', *Economic and Political Weekly,* May 27, pp. 2131-239.

Moynihan, P. Deniel (ed), 19690, On Understanding poverty, Basic Books, INC Publisher, *New York/ London,* P.9

Mukerji, B., 1961, Community Development in India, Orient Longmans, *New Delhi,* p-67.

Murty, K.N. and Soumya, A., 2007, Effects of Public Investment on Growth and Poverty, *Economic and Political Weekly,* Jan 6, pp. 47-59.

Olayinka A. Abosede, Princess C. Campbell, Emmanuel I. Okechukwu, Ajibike O. Salako-Akande, Anthonia O. Onyenwenyi, 2010, *African Journal of Primary Health Care & Family Medicine,* Vol 2, No 1

Planning Commission, Government of India, 1956, *Second Five Year Plan (1956-1961),* New Delhi, pp. 22 & 26.

Planning Commission, Government of India, 1961,

Third Five Year Plan (1961-66), New Delhi, pp. 1, 2 and 10.

Planning Commission, Government of India, 1966, *Fourth FiveYear Plan* (1969-74), New Delhi, pp. 16-17.

Planning Commission, Government of India, 1974, *Fifth Five Year Plan* (1974-79), New Delhi, p. 164.

Planning Commission, Government of lndia, 1980, *Sixth Five Year Plan* (1980-85), New Delhi, p. 34.

Planning Commission, Government of India, 2006, Poverty Estimates for 2004-2005, *Report of the 11th Plan Working Group on Poverty Alleviation Programmes,* New Delhi

Peter, L. and Shariff, A., 2004, Rural Non-Form Employment in India - Access, Incomes and Poverty Impact, *Economic and Political Weekly,* Oct. 2, pp. 4429-4446.

Patricia H. Werhane, Scott P. Kelley, Laura P. Hartman, Dennis J. Moberg, 2009, *Alleviating Poverty through Profitable Partnerships Globalization, Markets, and Economic Well-Being.*

Ranjan Ray, 2000, 'Poverty, Household Size and Child Welfare in India', *Economic and Political Weekly,* Sept. 23, pp. 3511-3520.

Rath, S., 2003, Poverty by Price Indices, *Economic and Political Weekly,* Oct. 4, pp. 4260-4268.

Sundaram, K. and Tendulkar, S.D., 2004, 'The Poor in the Indian Labour Force - Scenario in the 1990s, *Economic and Political Weekly,* Nov. 27, pp. 5125-5132.

Thomas Pogge and S.G. Reddy, 2006, 'Extent, Distribution and Trend of Global *Income Poverty', Economic and Political Weekly,* June 3, pp. 2241-2247.

Thakur, J., Bose, M.L., Hossain, M. and Jonaiah, A., 2000, Rural Income Distribution and Poverty in Bihar - Insights from Village Studies, *Economic and Political Weekly,* Dec. 30, pp. 4657-4663.

Tiwari, P.K., 1994, *Rural Poverty Technology and Development,* Chugh Publications, Allahabad.

Vaidyanathan, V., 2001, 'Poverty and Development Policy', *Economic and Political Weekly,* May 26, pp. 1807-1822.

World Bank, 1975, *World Bank Sector Paper,* Rural Development, Washington DC, p. 3.

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Assessment of Rural Livelihood Options through JEEViKA in Siwan District of Bihar

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Abstract

Livelihood is the important concern for all living beings and livelihood options are primarily agriculture and allied occupations in the rural area. The Government's key strategy to rural development is to focus on rural livelihood programmes. The primegoals of these programmes have been to improve the quality of life of rural people by alleviating poverty, providingself-employment and community infrastructure facilities.Bihar is one of the most populated state in India with 8.6 % of the country's population but covers only 2.8 % area of the country. JEEViKA is anambitious Bihar Rural Livelihood Project (BRLP). It has been designed to address rural poverty through collaboration of Bihar Government and theWorld Bank. According to annual report ofJEEViKA 2016-17, 19 lakhhouseholdsare directly involved in 534 different blocks of 38 districts of Bihar. The objective of the study is to analyse the role, structure and rural livelihood options through JEEViKAin Siwan district.This paper is based on secondary sources of data and field observation applyingqualitative analysis for interpretation.Secondary data have been collected from various government and non-governmentagencies. Maps are prepared in ArcGIS,and the data have been calculated in Excel.

Keywords : collaboration, community, empowerment, rural livelihood.

Introduction

There is a consensus that livelihood is about the ways and means of making a living. Livelihood comprises the capabilities, assets (including both material and social resources) and activities required for means of living. One feature that all definitions and interpretations about livelihood share in common is that they eloquently underline the generally accepted idea that 'livelihood' deals with people, their resources and what they do with these. Livelihoods essentially revolve around resources (such as land, crops, seed, labour, knowledge, cattle, money, social relationships, and so on), but these resources cannot be disconnected from the issues and problems of access and changing political, economic and socio-cultural circumstances (Carney,

2002). Livelihoods are also about creating and embracing new opportunities.JEEViKA is Bihar's rural livelihood project (BRLP). It has been designed to address rural poverty in Bihar through the collaboration of the government of Bihar and the World Bank. According to the BRLPS mission, the core strategy of the JEEViKA programme is to build vibrant and bankable women's community institutions in the form of self help groups (SHGs), who through member savings, internal loaning and regular repayment become self sustaining organizations. The groups formed would be based on self-savings and revolving fund and not on a single dose of community investment fund (CIF) funds for association given as a subsidy. The primary level of SHGs would next be federated at the village, by forming village organizations (VOs), then at a cluster level, to become membership based, social service providers, business entities and valued clients of the formal banking system. Such community organizations would also collaborate with a variety of organizations provided back end services for different market institutions such as correspondents for banks and insurance companies, procurement franchises for private sector corporations and delivery mechanisms for a variety of government programmes. This project was started in October 2007; currently, 19 lakhs households joined to this project in 534 blocks of 38 districts in Bihar, according to annual report of JEEViKA, 2016-17. It aims to improve rural livelihood options and work towards social and economic empowerment of rural poor, particularly women. Without women empowerment, we cannot think about social development,and if we focus on women's empowerment in the society, development of society will automatically occur.

The JEEViKA program provides the fund for livelihood activities. There are many activities based on farm, non farm and livestock for the rural livelihood options. Under "JEEViKA" scheme till now 3,65,150 Self Help Groups, 14,363 village organizations and 231 cluster level federations have been organized,and credit linkage of 75331 Self-help Groups have been accomplished. "Mukhya Mantri Nari Sakti Yojana" and "Sabla Scheme" also help led to improving the social status and condition of women in the society.The JEEViKA program has brought about some definite changes on a variety of dimensions in the lives of the socially and economically marginalized castes in Bihar (Datta Upamanyu, 2015). "Didi of rural Bihar: Real agent of change?"(Meena Tiwari, 2010).In this article, she has mentioned about the members of SHG and discussed about the social and economic empowerment of women.

The present study will discuss both on implementations of JEEViKA and livelihood options in Siwan district. The studies will emphasise on extend of JEEViKA has helped in sustaining the rural livelihood changes in present study area. JEEViKA is successfully in improving the living condition of the poor in Siwan district. It provides opportunities of employment for the livelihood changes. It is a livelihood- generating programme, and this programme can bring awareness about the poor people in study area. The main objectives of the present study areto evaluate the structure and implementation procedure of JEEViKA andto analyse the rural livelihoods options through JEEViKAin Siwan district.

Study Area

GeographicallySiwan District is located in the middle Ganga plan of northwestern part of Bihar. It extends between north latitudes 25 38 to 26 23 and east longitude 84 01 to 84 47 (Fig 1). The Siwan district having an area of 2219 sq. Km covering 2.4% of the state lands area with an average elevation of 77 meters. Gopalganj bound the district in north, river Ganga on southwest, on southeast and east by Saran
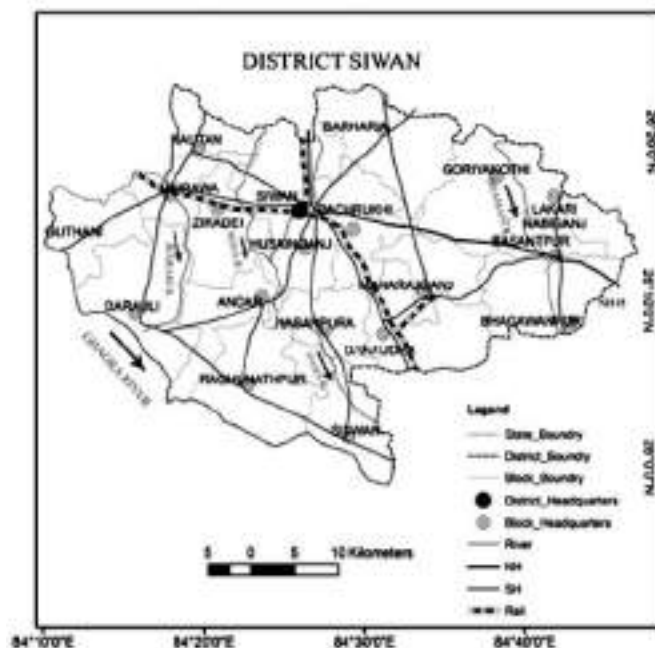
Figure 1: Location of the Study Area

district and West by Uttar Pradesh state. The district has its headquarter in Siwan. Ithas 19 development blocks and 1536 villages. The population of this district is 3318176 as per 2011 Census.

Database and Methodology

The present studyis based on both qualitative and quantitative data. Secondary datawas collected from District handbook, and report of theWorld Bank and BRLP (2015), we also gained knowledge from qualitative based on field observation. Informationwas collected from different studies like institutions and individuals, which are based on observation and attend the weekly meeting of JEEViKA's didi in the block level. We have participated in the different meetings and tried to understand the procedure and implementation of programmes at the block level.The households, which joined JEEViKA, constitute the population for the study. For the

analysis of the research paper different types of indicator have been taken such as farm, non-form, and livestock in activities. It has highlighted the involvement of households in different livelihood options. The tools Microsoft Excel and SPSS have been used for the analysis of data and maps are prepared in Arc GIS software.

Results and Discussion
Strategies and Structure of JEEViKA

According to the BRLPS mission, the core strategy of the JEEViKA programme is to build vibrant and bankable women's community institutions in the form of self help groups (SHGs), throughwhich member savings, internal loaning,and regular repayments become self sustaining organizations. The groups formed would be based on self-savingsand revolving fund and not on a single dose of community investment fund (CIF) funds for association given as a subsidy. The primary level SHGs would next

be federated at the village, by forming village organizations (VOs), then at a cluster level, to become membership based, social service providers, business entities and valued clients of the formal banking system. Such community organizations would also partner a variety of organizations providingback end services for different market institutions such as correspondents for banks and insurance companies, procurement franchises for private sector corporations and delivery mechanisms for a variety of government programmes.

State Level- The State Project Management Unit (SPMU) oversees and manages various functions of JEEViKA project at the state level with support from various functional specialists such as state project managers and project managers under the leadership of the chief executive officer (CEO) of JEEViKA. At the state level, the society focuses on designing policy, planning interventions and framing operational strategies. The Executive Committee compromises of senior government officials and representative members from civil society organizations as its members. Its main function is to guide the project and approve policy framework. The development commissioner is the president, and BRLP CEO is the member secretary of the council.

District Level- The District Project Coordination unit (DPCU) is responsible for coordinating, implementing and managing project activities across the district under the guidance of the district programme manager. The DPCU is now functional with thematic positions and supported by the finance and administrative staff.

Block Level- The Block Project Implementation Unit (BPIU) is a key unit of the project. It is the quality and effectiveness of this unit that determines how effectively the project rolls out in the field with the partnership of community institutions. The Block programme manager (BPM) is the functional head of this unit.

Area coordinators (AC) who in turn are supported by community coordinators (CC) support the Block programme manager.BPIU builds strong community institutions of the poor and subsequently intervene withwell-designed social and livelihood activities.Bihar Rural Livelihoods Project, JEEViKA has been working,and their deep impacts arebeing felt in the fields of women's empowerment andlivelihoods generation in rural areas. It is being implemented by the Bihar Rural Livelihoods Promotion Society, which is an independent body, formed by the Government of Bihar and supported by the World Bank. The objective of JEEViKA is to enhance the social and economic empowerment of the rural poor by formation of community institutions, sustainable livelihoods, awareness, empowerment and social protection (JEEViKA, 2015).

Rural livelihood is the engagement of rural population in various economically productive occupations. The hallmark of rural livelihood is agriculture and allied occupations. Major livelihood activities for rural population are cultivation of food and cash crops, fish farming, cattle rearing, dairying, food processing, wood industries, organized plantation activities such as rubber, tea, cashew, coffee, cardamom, pepper, etc. It can be seen that there is a gradual and increasing urbanization and industrialization of rural livelihood. Accepting the basic premise that, rural livelihood is what rural populations do, rural livelihood can broadly be grouped into agricultural and non-agricultural activities. Non-agricultural activities are similar to what urban populations are engaged. Agricultural and allied occupations are typical of rural livelihood. There are a large number of people who are engaged in agriculture and allied activities like cattle rearing, fish farming, dairying, etc. Landless people constitute the vast majority of rural mass who are engaged in agriculture and allied occupations. When we discuss about rural livelihood,

we should exclusively think about the agriculture and allied occupations.

Present Scenario of Rural Livelihood Options through JEEViKA in Siwan District

In the study area, most of the households are engaged in agricultural and allied activities. This paper is an attempt to study various livelihood options to identify area for improvement in their livelihoods. The present rural livelihood options are broadly classified into Farm, Non-farm, and Livestock through JEEViKA programme.

Farm-Based Rural Livelihood Options

In the farm-based livelihood options, we discuss the engagement of households in paddy, wheat, maize, and other activities. In others, activities that included are mango, banana, pulses, oilseeds, seeding nursery and potato

Table 1: Share of Households engaged in Rural Livelihood Options.

Blocks	Farm (%)				Livestock (%)				Non-Farm (%)			
	Paddy	Wheat	Maize	Others	Dairy	Poultry	Goat	Others	Weaving	Stitching	Petty Shop	Others
Siwan-sadar	22	20	16	42	50	9	40	1	24	26	15	35
Hussainganj	22	28	17	33	31	18	51	0	8	28	17	47
Maharajganj	21	24	21	34	36	7	53	4	9	39	12	40
Pachrukhi	30	22	17	31	50	5	40	5	8	43	37	12
Raghunathpur	22	23	21	36	61	16	23	0	12	45	43	0
Barhariya	71	15	4	10	0	19	81	0	6	51	39	5
Hasanpura	32	24	6	38	64	4	30	12	13	31	53	13
Basantpur	31	30	0	39	34	15	49	2	0	57	43	0
Ziradei	27	27	18	28	64	4	31	1	9	33	24	34
Siswan	42	42	8	8	19	14	67	0	37	49	13	1
Bhagwanpur Hatt	22	23	17	38	41	12	45	2	25	18	13	54
Darauli	21	24	8	47	48	5	46	1	39	33	28	0
Daraundha	25	25	8	42	70	12	16	1	42	30	9	19
Goriyakothi	21	17	0	62	50	30	14	6	15	45	36	4
Guthani	31	32	7	30	51	9	39	1	6	58	36	0
Andar	32	26	5	37	47	9	37	7	43	23	31	3
Lakri Naviganj	47	36	5	13	60	6	34	0	5	44	51	0
Nautan	35	38	3	24	50	11	39	0	0	46	21	33
Mairwa	26	27	11	34	46	11	40	3	9	30	20	41

Source: Computed by Authors From JEEViKA Official Data, Siwan, 2017.

cultivation.Figure 2 depicts the block wise house-hold engagement in different farm livelihood options. Here isthe highest percentage of householdsare engaged in paddy cultivation inBarhariyablock (71%) and lowest in Goriakothi, Maharajganj, and Siwan Sadar with (21%) respectively. Similarly, the highest percentage of households engaged in wheat cultivation in Siswan (42%), followed by Nautan (33%)and Lakrinaviganj (36%) respectively. The households engaged in lowest wheat production are in Barhariya (15%) and followed by Goriakhothi(17%) and Pachrukhi (22%) respectively. It is noted that the maize production is also a major crop production after paddy and wheat that is engaged the maximum households in different blocks in Siwan District. Figure2 shows that the maximum percentage of households engaged in maize activity in Raghunathpur and Maharajganj blocks with 21%, while minimum engagements are found in Nautan (3%) and Barharia(4%). However, the two blocks that

is Basantpur and Goriakhothi blocks under the JEEViKA programme are not involved in maize activity. Figure 2 also reveals the other activities like potato, pulses, oilseeds, mango, banana and nursery seed. In this livelihood options, the maximum percentage of household'sengagement are found in Goriakhothi(62%) and minimum in Siswan block(8%) respectively.

Non-Farm-Based Rural Livelihood Options

In the non-farm-based livelihood options, we discuss the engagement of households in paddy, wheat, maize and others activities. In the category of others activities mango, banana, pulses, oilseeds, seeding nursery,and potato cultivations are included.Figure3 shows the block wise household engagement in different non-farm livelihood options. Thehighest percentage of weavinghouseholds engaged in Guthani block (43%)and the lowest in Lakrinaviganj (5%), and Guthani (6%) with respectively. There are no any households are engaged in weaving in
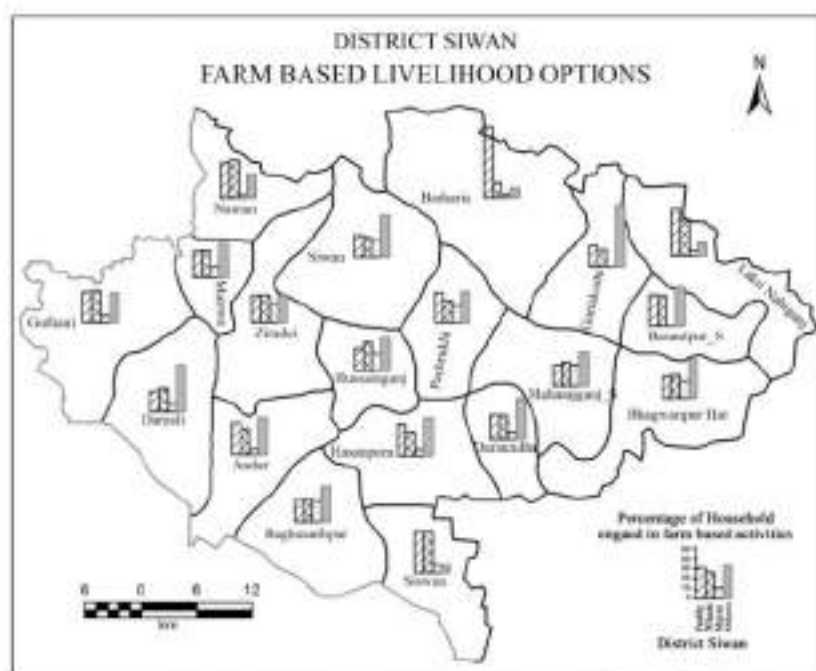

Figure 2: Distribution of Farm Rural Livelihood

Basantpur and Nautan blocks. Similarly, the highest percentage of households engaged institching of clothes are in Guthani (58%), followed by Basantpur (57%) and Barharia (51%) respectively, while the lowest households engagement in stitching are experienced in Bhagawanpur hatt (18%), followed by Andar (23%) and Mairawa (22%) block respectively. It is noted that the petty shop is also a prominent activity after weaving and stitching.The percentage of maximum households engaged in petty shop activities amongst the different blocks in Siwan District. Figure 1 shows that the maximum percentage of households engaged in petty shop activity in Hasanpura block with 53%, has the highest petty shop activity while minimum percentage of petty shop activities are foundin Daroundha (9%) and Maharajganj (12%). However both Siswan and Bhagawanpur hatt blocks under the JEEViKA programme. Figure 3illustrates other livelihood activities like incensing sticks, beekeeping, jute, carpet,and blanketing. In this livelihood options, the maximum percent-

age of householdengaged in one of these other livelihood activities is Bhagawanpur hatt (54%),and the minimum is Andar block (3%). Some of theblocks, which are not engaged in any of the other activitiesin Siwan District under theJEEViKA programme.

Livestock-Based Rural Livelihood Options

In the livestock-based livelihood options, we discuss the engagement of households in paddy, wheat, maize and others activities. In the others, activities categoryare included mango, banana, pulses, oilseeds, seeding nursery,and potato.Figure 4 shows the block wise household engagement in different livestock-based livelihood options. The highest percentage of households engaged in dairy activity is Daroundha block (70%),and the lowest is Hussainganj (31%), Maharajgaj (36%), and Siswan(19%) respectively. Similarly, the highest percentage of households engaged in poultry in Goriakothi (30%), followed by Barharia (19%) and Hussainganj (18%) respectively, while the low-
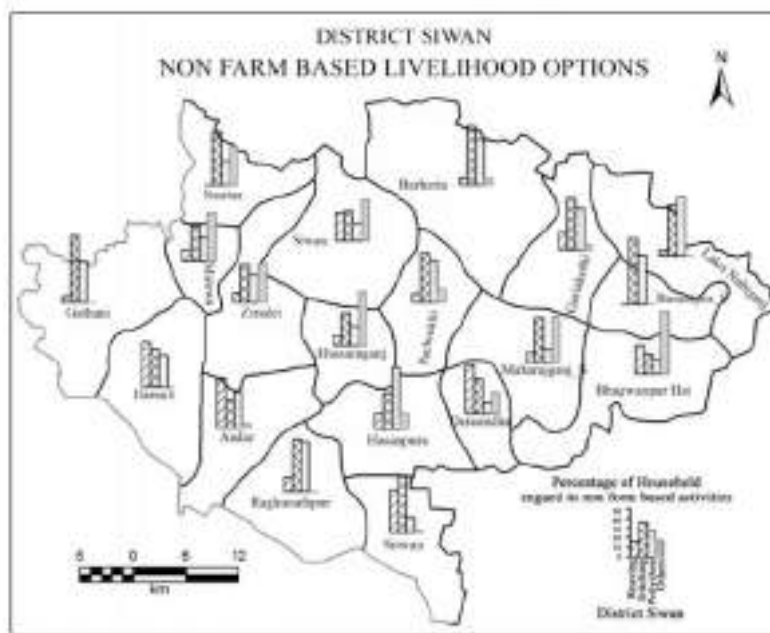

Figure 3: Distribution of Non Farm Rural Livelihood

est households engagement in the poultry are Ziradei (4%) and Hasanpura(4%) followed by Pachrukhi (5%) and Lakrinaviganj (6%) respectively. It is noted that the goat is also a major livelihood activity after dairyand poultry.Figure 4 shows that the maximum percentage of households engaged in goat activity are Barharia block with 81%, while minimum engagement in Goriakothi (14%) and Daroundha (16%). Figure 4 also reveals that other activities like piggery and fishery. In these livelihood options, the maximum percentage of household engagedare found in Hasanpura (12%),and minimumare found in Guthani, Darauli and Daroundha blocks with only 1% household engaged in piggery or fishery activities.While, there are no available livelihoods options in Hussainganj, Barharia, Raghunathpur, Nautan, Lakrinaviganj,and Siswan Blocks.

The research studyhighlights thepattern of empowerment dependent on JEEViKA programme. It is an internal process that people develop and strengthen. The ability to have their voice in matters, was related to the ability to think for their selves, and their aspirations, like a woman, said that "JEEViKA ne hume aapna pehchan or sapne dekhne ka mauka diya hai" (JEEViKA, has given us a personal identity, as well as the ability to dream for ourselves")

Conclusion

The study concludes that the JEEViKA programme has impact on life of rural people to provide the livelihoods opportunities in Siwan District. It is involved to maintain mainly agricultural and allied activities.JEEViKA has focused on available local resource that is based on primary activities where the more than 80 per cent population engaged in agricultural activities. In the present study, most of the households are engaged in farm,nonfarm and livestocklivelihood activities over the past few years in the village. JEEViKA has been major
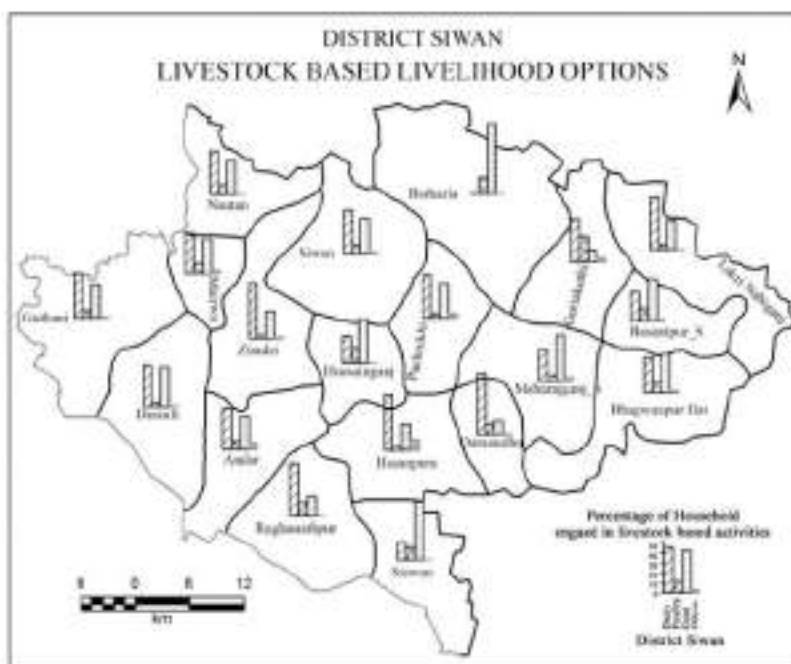

Figure 4: Distribution of Livestock Rural Livelihood

milestones towards their emancipation as the community benefited from their engagement in it. A major shift in the community is noticeable in the way the people of the village are currently perceiving the program. From being reluctant to participate in government schemes, today most men encourage their women to join SHG's. It is for the first time that the state and the community are considered as partners. The state often considered the community as patron, but never reached the marginalized. With in four years of implementation, JEEViKA has provided opportunities to understand models of promoting collective action and rural livelihoods options. These learning in the context of Siwan Districtare expected to improve understanding on the policies and programmes in the context of rural livelihood development across the country as well as Biharand how the lessons that need to be kept in mind to ensure development and inclusion go hand in hand.Thus, we have seen during the field visit; particularly women are participating in decision-making process at the household level. Therefore, there is a need to make policy for creating livelihood opportunities which are based on local resources other wise rural people will move to urban centers in search of better livelihood options in the sectors like construction, transport,and hotels as wage labourers.

References

Annual Report, BRLPS, 2011, Retrieved from <http://brlp.in/an-nual.php>, accessedon 26 October 2016 at1800.

Barrett, C.B., Reardon, T. and Webb, P., 2001, Non-farm income diversification and household livelihood strategies in rural Africa: Concepts, dynamics, and policy implications. Food Policy, 26(4): pp.315-31.

Belay, Habtemariam Kassa, 2003, Livestock and livelihood security in Harar highlands in Ethiopia, Sweden, and Swedish University of Agriculture Science.

Bhaumik, S.K., 2007, Diversification of employment and earnings by rural households in West Ben-gal. Indian Journal of Agricultural Economics, 62(4): pp. 585-606.

Carney, D., 2002, Sustainable Livelihoods Approaches: Progress and Possibilities for Changes. Department for International Development, London, UK.

Chambers, R., and G. Conway,1992, Sustainable Rural Livelihoods: Practical Concepts for the 21st Century. Brighton: Institute of Development Studies.

Datta, Upamanyu., 2015, "Socio-Economic Impacts of JEEViKA: A Large- Scale Self-Help Group Project in Bihar, India" World Development, Vol. 68, pp. 1-18.

Desai, R. M., & Joshi, S., 2014, Collective action and community development: Evidence from self-help groups in rural India. World Bank Economic Review, 28(3), pp. 492-524.

DFID (Department for International Development). 1999. Sustainable Livelihoods Guidance Sheets. London: DFID.

Ellis, F., 2000, Rural Livelihoods and Diversity in Developing Countries, Oxford University Press, Oxford, U.K.

Fazal, S., 2001,The Need for Preserving Farmland, A Case Study from a Predominantly Agrarian Economy (India), Landscape and Urban Planning 55: pp. 1-13.

JEEViKA. 2015, Annual report. Patna: Government of Bihar.

Karmakar K. G., 1999, Rural Credit and Self-Help Groups; Micro Finance needs and concepts in India, Sage Publication, New Delhi.

Kumar, P., Singh, N.P. and Mathur, V.C., 2006, Sustainable agriculture and rural livelihoods: A synthesis. Agricultural Economics Studies, 32(6): pp. 850-75.

Pitt, M. M., & Khandker, S. R., 1998,The impact of group-based credit programs on poor households in Bangladesh: Does the gender of participants matter? Journal of Political Economy, 106(5), pp. 958-996.

Tiwari, M., 2010, "Didi of Rural Bihar: Real Agent of Change?"Economic and Political Weekly, 45 (33), August 14- 20, 2010.

Vyas, V. S. and G. Mathai, 1978, Farm and Non-Farm Employment in Rural Areas: A Perspective for Planning, Economic and Political Weekly, Vol.13, No. 6and 7, (February annual number): pp. 333-347.

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Gender disparity in Literacy in Bareilly district

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Abstract

Literacy has been considered as one of the prime determinants of the socio-economic development. In this context, education has become an important gateway for upgrading the socio-economic status of the people of a region. From a geographical point of view, literacy rate varies from region to region and withthe passage of time, it assumes spatio-temporal characteristic. According to the census of India 2011, the overall rate of literacy of the country is 74% with the male literacy rate being 81% against 64.40% of female literacy. So, a large gap can be seen between male-female literacy rate. Despite number of efforts done at both state and national level, there remains a large number of illiterate people, existing in the society and presents major hurdle in the socio-economic development of the region. This scenario is a matter of great concern. An attempt has been made in this paper to map and analyze the gender gap in literacy rate of Bareilly district. This study is based upon secondary sources of data. This paper provides an insight into the existing spatio-temporal patterns of male-female literacy rate and its level of disparity. The findings suggest that a significant difference undoubtedly, exist between male and female literacy rate at block level in Bareilly district.

Keywords : literacy, development, gender, disparity index, bareilly .

Introduction

Educational disparity is a major characteristic of multi-religious society. Although India has faced numerous social, political and economic issues within the last three centuries, inequality remains one of the most important historical omnipresent aspect of our society, especially the gender differences in schooling experience of adolescents (Wu, Goldschmidh, Azam and Boscardin, 2006) and also in inequality of gender-based children enrollment in rural areas (Kington, 2007). Women are the integral part of the society and improvement in their literacy means improvement in society. So, it is necessary to educate each and every woman. In India, women constitute approximately half the total population, which is 48.45% (Census of India, 2011). The existing studies reveal that the educational disparity between male and female in terms of access to school (Lori, 2000 and Lavy, 2004), socio-economic structure and the religious nature of society (Despanday, 2007) all across the world has its direct impact on socio-economic and regional development (Siddiqui and Yadav, 2004). According to Census of India 2011,

the literacy rate of UP has increased from 21.7% in 1971 to 67.3% in 2011 which is stilllower than the national average. However, the existing data indicates a large gap between male and female literacy rate. The level of literacy varies from district to district and also from block wise within districts in Uttar Pradesh.Present research paper highlights the spatio-temporal disparity in literacy rate of male and female population in Bareilly district of U.P from 2001 to 2011. An attempt has been made in this study to identify the literacy deficient areas and analyze gender gap in literacy rate in study area, which can help policy makers to improve their education related developmental strategies on district level. The objective of this study is to analysis the micro-regional (Block level) variations in male and female literacy rate in Bareilly district using Sopher's disparity index method.

Database and methodology

The present study is based on secondary data obtained mainly from the publications of Census of India. The census publications from where data has been collected for the period 2001-20011 includes General Population Tables, District Census Handbooks of Bareilly District, Primary Census Abstract, Final Population Tables. Block has been considered the most appropriate unit of study for which data is available. To achieve the above-mentioned objective, Sopher's disparity index has been used to examine the regional disparity patterns in male-female literacy of Bareilly district for the period 2001 to 2011. According to sopher's disparity index method, if X1 and X2 represent the respective percentage value of variable of corresponding to A and B then the disparity index (DI) calculated by following:

DI = Log (X2 /X1) +Log (100 - X1) / (100 - X2)

Where, DI = Disparity Index

X2 = Percentage of male Literates.

X1 = Percentage of female Literates.

$$i.e. \ X_2 = X_1$$

According to Sopher, in the case of perfect equality i.e. no disparity, the value of DI will be zero and a high value of DI means higher is the level of disparity similarly a low value of DI means low disparity between the variables. Generally, Sopher's disparity index is useful in measuring the relative disparity.

Literacy projection

In order to calculate the time period to achieve 100 percent literacy, we have applied the time series analysis.

$Pn = P_0 (1 +R/100)^n$

Where Pn = 100 (literacy to be achieved), P_0 = present literacy, n= number of years, r = rate (difference in literacy rates between periods).

Study area

Bareilly district is located in the north western part of U.P. and lies between latitude $28^001'$ to $28^054'$ north and longitude $78^058'$ to $79^047'$ east and comprises a total area of 4120sq.km. It is bounded by Uttrakhand state in the north, Rampur District in the west, Badaun District in and south, Pilibhit District in the east. There are six sub divisions in the district namely Aonla, Baheri, Bareilly, Faridpur, Nawabganj and Meerganj. Apart from this, the district has been divided into 15 blocks, namely Baheri, Bhadpura, Bhuta, Bithrichainpur, Faridpur, Fatehganj west, Jafrabad, Kyara, Majhgwan, Meerganj, Nawabganj, Ramnagar, Richha and Shergarh. The north-south extension of the district is about 96 km and corresponding east-west extension is about 75 km. According to 2011 Census of India, the population of Bareilly District is 44, 48,358. The general sex ratio is 887 females for every 1000 males. The average literacy rate is 58.49% with male and female literacy being

67.50% and 48.30% respectively. The district is part of the southern upper Ganga Plain and it also belongs to the tarai region in which agriculture is the main occupation. The district is re- markably fertile and the irrigation infrastructure is well developed here. Sugarcane, rice, wheat, maize, pulses, etc. are the major crops in the district.
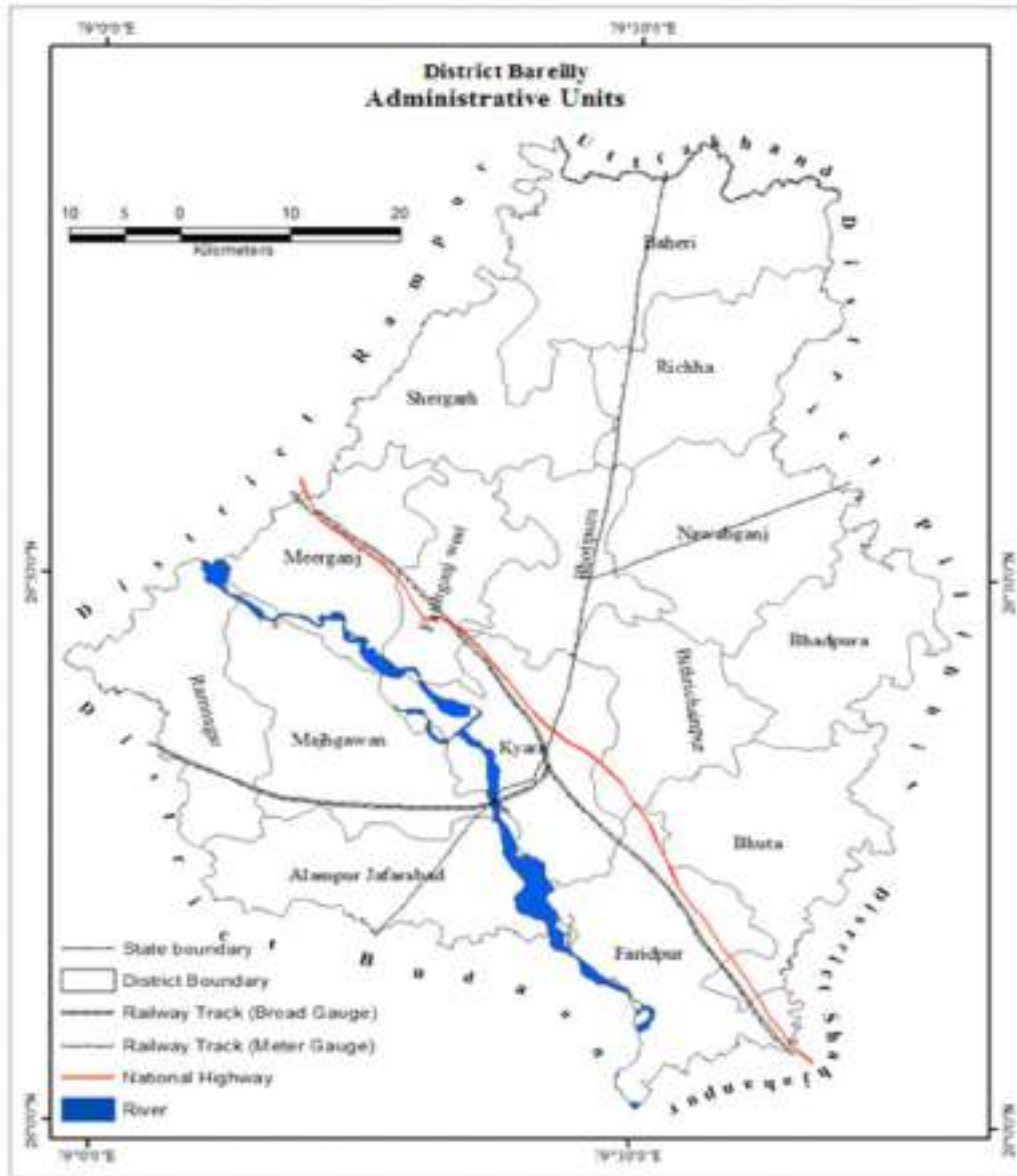

Figure 1: Location of study area

Result and discussion

Trends of literacy rate

The census data shows large variations in literacy rate between states and also within districts in our country. The total population of India has increased from 56.69 crore in 1971 to 121 crores in 2011. The literary rate has also increased from 34.45 % in 1971 to 74.04 % in 2011 (Table 1). Table - 1 show that the differences in literacy rate from 1991 to 2001 was highest in comparison to previous five decades that is near about 13 percent.

Literacy in Uttar Pradesh was never above the national average in the period of 1971 to 2011, with the rate being 21.7 % in 1971 to 67.3 % in 2011. In Uttar Pradesh, there remains large variations in literacy rate. The literacy rate of Bareilly district has always been below the state and national average from the period of 1971 to 2011(Table1). In 1971 there were only 17.82 % literate person. However, Table-1 reveals that census conducted in 1981, 1991, 2001 and 2011 the literacy rate in crease in literacy rate rapidly 22.00%, 32.78%, 47.84% and 69.72 % respectively. This increase of literacy rate has a male advantage with an improvement of about 43.23 percent (from 24.27% to 67.50%) against the females where improvement was only 38.38 percent (from 9.92% to 48.30%) during these census period (Table2). As per 2011 Census, in Bareilly district the highest literacy rate was observed in Bhadpura block (63.09%) as a result of improved in education facilities and awareness whereas the lowest literacy rate was recorded in Ramnagar block (50.51%) due to poor educational facilities and low awareness. (Table 4).

Table 1 also reveals that the literacy gap between Bareilly district and Uttar Pradesh has continuously increased from 3.88 percent to 11.23 percent during the period of 1971 - 2011 as a result of differences between developmental growth of educational facilities and infrastructure, social awareness and socio-economic status of people. On the other hand, the literacy gap between India and Uttar Pradesh has increased from 12.75 percent to 16.37 percent during the census year 1971 to 1981. Afterwards it hascontinuously declined from 16.37 percent in 1981 to 4.32 percent in census year 2011 in response to the increasing similarities recorded in the level of developmental growth in educational facilities and infrastructure, social awareness and socio-economic status of people both country as well as state level.

Table 1: Trends of Literacy rate and gap in India, Uttar Pradesh and Bareilly district, 1971-2011

Sl No.	Census Year	India	Uttar Pradesh	Bareilly	Literacy gap between India and Uttar Pradesh	Literacy gap between U.P and Bareilly district
		Total Literates (%)				
1	1971	34.45	21.7	17.82	12.75	3.88
2	1981	43.57	27.2	22.00	16.37	5.20
3	1991	52.21	41.6	32.78	10.61	8.82
4	2001	64.83	56.3	47.84	8.53	8.46
5	2011	74.04	67.3	58.49	4.32	11.23

Source: Census of India, District census handbook of Bareilly, 2011.

Literacy rate and Gender disparity in Bareilly district

Table 2 reveals that the literacy rate of population, both male and female has been continuouslyincreasing. The total literacy rate of Bareilly district increased from 17.82% to 58.49% during the reference period of 1971 to 2011. The literacy rate of male population increased from 24.27% to 67.50% on the female literacy rate increased from 9.92% to 48.30% during the same time period.

These figures also indicate that gender disparity in literacy rate has increased from 14.35 percent to 23.51 percent during the census year 1971 to 2001. Thereafter, it has been decreasing since 2001. Comparing gender disparity across different years, we find that gender disparity was the lowest (14.35%) in 1971 while it was the highest (23.51%) in the census year 2001. According to the data of table 2, the net

Table 2: Literacy rate and Gender Disparity in Bareilly, 1971-2011

Year	Total Literacy Rate (%)	Male Literacy Rate (%)	Female Literacy Rate (%)	Gender Disparity (male/female difference in literacy rate in percent)	Net change in gender disparity
1971	17.82	24.27	9.92	14.35	-
1981	22.00	31.10	12.30	18.80	+4.45
1991	32.74	43.33	19.85	23.48	+4.68
2001	47.84	58.73	35.22	23.51	+0.03
2011	58.49	67.50	48.30	19.20	-4.31

Source: Author's calculation based on data from District statistical handbook of Bareilly, 1971-2011.
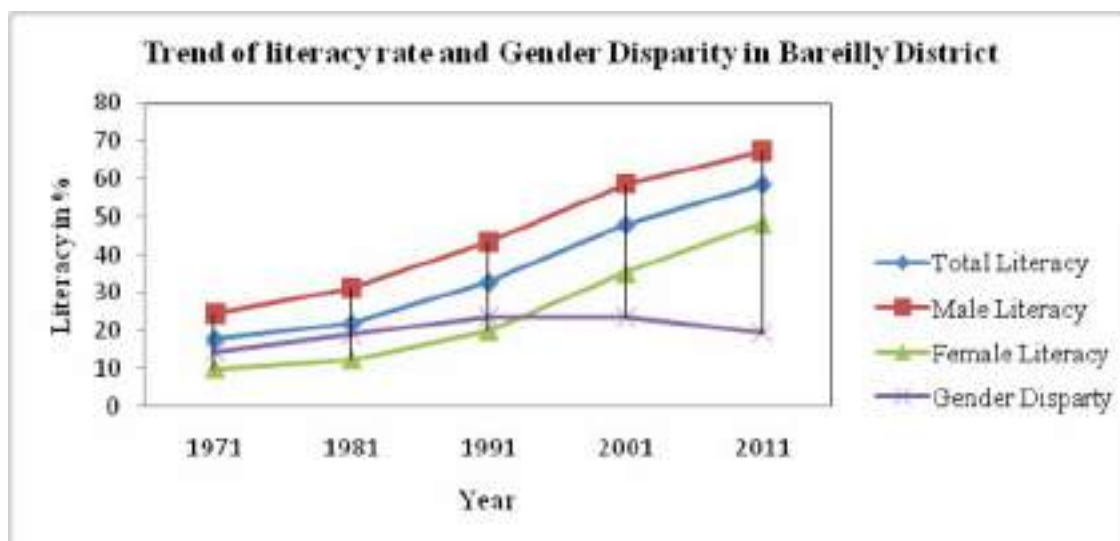

Figure 2: Trend, literacy rate and gender disparity in study area.

charge in gender disparity was the highest during 1981-1991, i.e. 4.68% and the lowest during the period of 1991-2001, i.e. 0.03%. So, the figure reveals that on one hand literacy rate of the district is increasing and the gap between male and female literacy is declining during the reference period.

According to Table 3, more than 40% of the total population of Bareilly district is illiterate in 2011. The total gender disparity in literacy is 19.20%, with 23.03% in rural areas and 12.49% in urban areas. Looking closely, the literacy rate (55.89%) of rural areas is lower than total average literacy of district (58.49%) as well as urban literacy rate (63.05%).From Table 3, some major facts are evident-

(a) Literacy rate of rural female (43.59%) is lowest compared to urban female literacy rate (56.46%) and the total average female literacy rate (48.30%).

(b) The gender gap in literacy rate is highest in rural area i.e. 23.09%.

(c) Finally, the most important fact that the literacy among female population is unfavourable in all cases.

Table 3: Literacy Rate and Gender Gap in Bareilly District, 2011

Sl No.	Geographical Location	Total Literacy (%)	Male Literacy (%)	Female Literacy (%)	Gender Gap (Male Literacy-Female literacy)
1	Total	58.49	67.50	48.30	19.20
2	Rural	55.89	66.68	43.59	23.09
3	Urban	63.05	68.95	56.46	12.49

Source: District Census Handbook of Bareilly 2011.

Table 3, shows that the total literacy rate of Bareilly district in 2011 is 58.49 percent, while male literacy is at 67.50 percent, female literacy is only 48.30 percent. Thus, there is a 19.20 percent gender gap in male and female literacy rate.

Micro-regional (block-level) analysis of literacy rate and gender disparity

In this section the major attempt is to identify the spatial patterns of male-female literacy in Bareilly district during 2001 - 2011 with the help of Sopher's Disparity Index method. Development Block has been considered as the most appropriate unit for analysis. In Bareilly district, there are 15 blocks (Table 4). Three types of region have been identified based on the male-female literacy patterns as given below:

(a) Region of low disparity index

(b) Region of moderate disparity Index

(c) Region of high disparity index

Male-female disparity has been divided into three categories in the study area high, medium and low i.e. (0.57-0.62), (0.52-0.57) and (0.47-0.52) respectively in the year 2001. Whereas in the year 2011, the disparity has been decreased in all the blocks in which high ranges between (0.45-0.49), medium (0.41-0.45) and low (0.37-0.41). Higher disparity index in 2001 was found in Bhuta (0.62), and Bhadpura (0.62) andRamnagar (0.58) blocks whereas medium disparity index was in Nawabganj (0.55), Faridpur (0.55), Meerganj (0.53), and Fatehganj (0.53) blocks (Figure 4). In 2001 there was eight blocks under low disparity index category Shergarh (0.52),Bhojipura (0.51),Alampur Jafrabad (0.51),Majhgawan (0.51), Richha

Table 4: Block-wise Male-Female Disparity Index of Literacy in Bareilly District, 2001-11.

Sl No.	Block name	2001				2011			
		Male Literacy (%)	Female Literacy (%)	Total Literacy	Disparity index	Male Literacy (%)	Female Literacy (%)	Total Literacy	Disparity index
1.	Baheri	56.61	29.9	44.11	0.48	67.79	47.2	58.02	0.37
2.	Shergarh	49.05	22.54	36.82	0.52	62.06	39.31	51.4	0.40
3.	Richha	57.8	29.56	44.54	0.51	69.05	46.57	58.42	0.40
4.	Meerganj	54.24	25.65	41.33	0.53	63.89	41.84	53.56	0.39
5.	Fatehganj West	54.03	25.63	41.04	0.53	65.77	42.73	55.02	0.41
6.	Bhojipura	59.44	30.94	46.19	0.51	64.56	42.14	53.93	0.39
7.	Kyara	51.1	25.27	39.54	0.49	66.05	44.36	56.08	0.38
8.	Ramnagar	49.37	20.34	36.12	0.58	61.76	37.5	50.51	0.43
9.	Majhgawan	49.36	22.86	37.28	0.51	61.4	38.18	50.65	0.41
10.	Aalampur Jafarabad	54.89	27.25	42.32	0.51	67.06	43.94	56.39	0.41
11.	Bithiri Chainpur	57.43	29.605	44.23	0.50	68.53	45.48	57.66	0.41
12.	Nawabganj	60.18	29.66	45.88	0.55	72.09	47.28	60.37	0.45
13.	Bhadpura	62.7	28.37	46.9	0.62	75.21	49.27	63.09	0.49
14.	Bhuta	54.68	24.7	41.04	0.62	68.13	43.95	56.92	0.43
15.	Faridpur	54.83	25.4	41.7	0.55	66.02	42.93	55.44	0.41
16.	Total District	58.73	35.22	47.84	0.41	67.50	48.30	58.49	0.34

Source: Calculated by author using Sopher's disparity index technique from district statistical handbook, 2001-11.

(0.51), Bithiri chainpur (0.50), Kyara (0.49) and Baheri (0.48). But in 2011, higher disparity index was in Bhadpura (0.49) and Nawabganj (0.46) blocks whereas Bhuta (0.49)and Ramnagar (0.43) blocks were in medium disparity index category. There was eleven blocks Fatehganj (0.41), Majhgawan (0.41), Alampur Jafrabad (0.41), Bithiri chainpur (0.41), Faridpur (0.41), Shergarh (0.40), Richha (0.40), Meerganj (0.39), Bhojipura (0.39) Kyara (0.38), and Baheri (0.37) comes in low disparity index category.

Literacy projection and consequences

According to the District census handbook of Bareilly district of 2011, the male literacy, female literacy and total literacy rate of Bareilly district is 67.50%, 48.30%and 58.49% respectively. In order to calculate the time period within which 100 percent literacy could be achieved
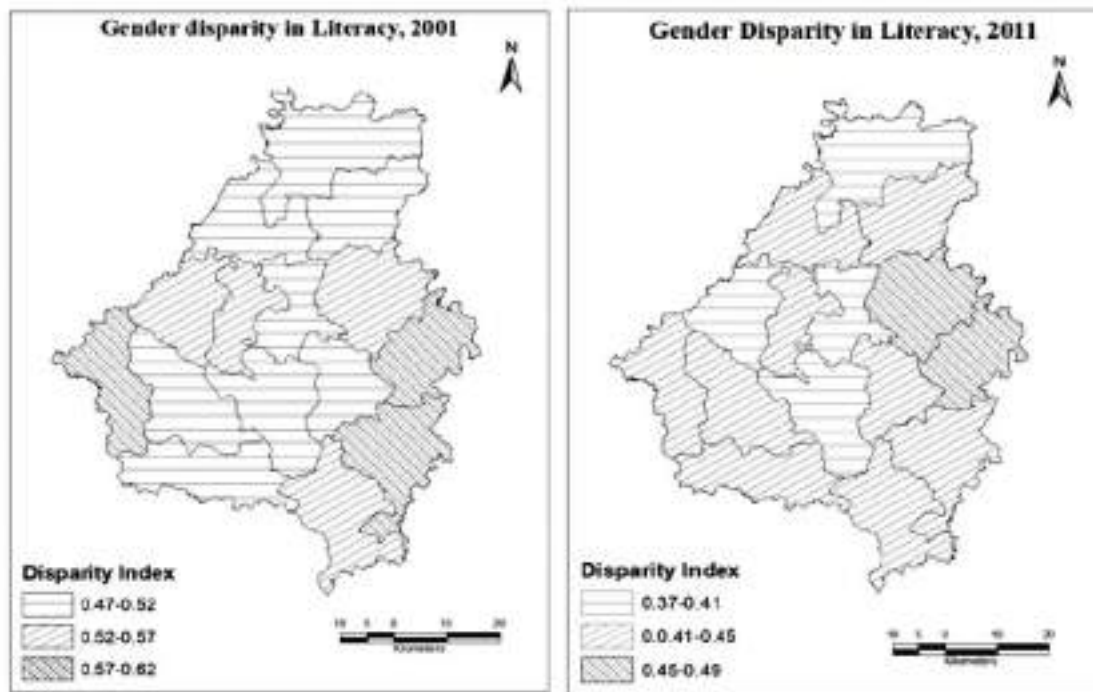
Figure3: Gender disparity in literacy in study area, 2001-2011.

we have applied a time series analysis:

$$Pn = Po \ (1+R/100)^n,$$

After putting the values in the above equation, we got expected time in which the literacy rate will be 100%. It comes out approximately 46 years for male, 55 years for female and 51 years for total population.

Conclusion

This paper provides an insight into the existing pattern of literacy rate and the level of disparity between male-female literacy in Bareilly district. The study clearly indicates that there is a wide range of variation in male-female literacy among the blocks of Bareilly district has been found. It is worth noting that gender disparity in literacy rate has declined from 23.51% to 19.20% during the period of 2001-2011. Hence, the cumulative result shows that during 2001-2011 there was significant increase in female literacy rate in the blocks of Bareilly district. This trend confirms the notion that governmental encouragement along with growth in educational facilities and increasing awareness in rural areas are showing positive results but they need to be enforced affectively so that the progress can be continue in future also. Moreover, the quantitative analysis highlights the urgency required to take more positive for reducing gender disparity in district.

References

Assadulllah, M.N. and Yalonetzky, G., 2010, *Inequality of educational opportunity in India: Changes over time and across states.* IZA Discussion Paper No.5146

Bing W.K., 2008, *Education and inequality in developing world.* Spinger publication

Deshpanday, 2007, *Overlapping identities under liberalization: Gender and caste in India.* Economic development and cultural change, vol.55, pp.735-760

District Census Handbook of Bareilly district 2011.

District statistical handbook of Bareilly district 1971,1981,1991,2001 and 2011.

Kington, Geeta, 2007, *The progress of school education in India.* Oxford Review of Economic Policy, 23(2), pp.168-195.

Lavy, V., 2008, Do gender stereotypes reduce girls or boys human capital outcomes? *Evidence from a national experiment. Journal of Public Econamic,* vol.92, no.10 and 11, pp.2083-2105.

Mensch, B.S. and Lloyd C.B., 1998, *Gender differences in the schooling experiences of adolescents in low income countries: The case study of Kenya. Studies in family planning,* vol.29, no.2, pp.167-184.

Sopher, S.B. and Athawale, A.S., 1994 *Population geography,* Mehta Publishing House, Pune, pp.118-119.

Sopher, D.E., 1974, *A measure of disparity,* The professional Geographer, vol.26 (4), pp.389-392.

Wu, K., Goldschmidth, C. and Azam, M., 2006, Girls in India: Poverty, Location and Social Disparities.

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Gender Disparity in Work Participation: A Comparative Study of Varanasi District, U.P.

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Abstract

In India, female comprises 48% of the total population but their participation in economic activities is only 25% in comparison to 53.20% participation of male, which shows the high disparity in work participation. It is very necessary to provide equal opportunity to all women, to participate in economic activities to boost up our economy, improving their living standards and all types of nutritional support to the family. This paper is an attempt to analyze gender disparity in work participation comparing rural and urban populations in Varanasi district. To analysis, the gender disparity in work participation, block-level gender disparity has been calculated using the Crude Work Participation rate and Sopher Disparity Index(D). The results show that each block has a high gender disparity, and comparatively urban areas have higher gender disparity index than that of rural, due to patriarchal mindset, unsafe work environment, and unequal job opportunities, etc.

Keywords : gender disparity, work participation rate, sopher disparity index.

Introduction

Working Population is a driver of economic growth and development of the nation it is an important factor for socio-cultural and demographic transformation. The working population is defined as males and females who are either engaged in productive employment or temporally unemployed (Trewartha, 1969). This working population includes workers in all types (primary, secondary and tertiary sectors) of economic activities. Census of India divides this working population into four categories such as cultivators, agricultural laborers, workers in the household industry and other workers. In India, the participation rate of the working population is very low about their total population and there is a wide gap between male and female work participation rates. This gap shows the discriminatory attitude of government policies, civil societies, and individuals toward women, which creates inequality in the level of living standard, social status, and representative role in authorities, in job opportunity and education. This discrimination is termed as gender disparity. In India total work participation rate is 39.32 %, in which female work participation rate is only 25.51 % against 48 % of their total population share and in Uttar Pradesh, this work participation rate is 33.2 % of the total population against 17.1 % of female and 47.91 % of the male work participation rate. This data presents a higher

gender disparity at every level in the work participation rate. This gap provides a big scope to study and making policies to reduce gender disparity. There are many factors behind gender disparity like social dimension, marriage, fertility and women's role outside the household. Males are the bread earner of the family and females are expected to take care of the family. Secondly, measurement issues like household activities should be considered as economic activities where less-educated women have higher work participation. The family which has higher income has a lower level of female work participation. Ignorance of equal opportunity to female create problems for women. Female disproportionately face multiple challenges regarding access to employment security, balancing work and family responsibilities. This ignorance and discrimination increase gender disparity in society (Verick, 2014)

Economic growth is not enough for increasing women's participation in economic activities (Swaminathan 2014). Females in households with higher per capita expenses are less likely to be in the labor force (Das,2015). So, our government and civil society should provide females a safe, equal, and enjoyable opportunity. The objective of this paper is to Analyze the gender disparity in the work participation rate in Varanasi district and their comparative study between rural and urban areas.

Study Area:

Varanasi district is located between 25°03'45"N to 25°09'40" N latitudes and 82°39'33"E to 83°10'42" E longitudes on the left bank of river Ganga. An average elevation of Varanasi is 80.71 m above mean sea level. The geographical area of the district is 1535 km2, divided into two tehsils namely Pindara and Sadar, and 8 Blocks namely Cholapur, Chiraigoan Arajiline, Baragoan, Harhua, Sevapuri, Kashividyapeeth, and Pindara. The population of the district is 3676841, The district comprises rural and urban populations both. The density of this district is 2395 person/km2, sex ratio is 913 and the literacy rate is 75.6%. In Varanasi district total work participation rate is 33.20 % in which the female work participation rate is 17.06 % against 47.93 % of the male work participation rate. This gap in the work participation rate is an indicator of Gender Disparity.

Data Sources and Methodology:

This paper is exclusively based on secondary data collected from the District census Handbook and census of India 2011. Maps are prepared on a GIS platform from calculated census data. Gender disparity map of urban, rural workers is prepared with the help of the base map and census data. The work participation rate is measured by the formula,

WPR (X) = TW/TP×100

Where, WPR = Work Participation Rate, TW=Total Worker, TP=Total population,

The gender disparity index is measured by Sopher's method,

D= logX2/X1 + Log (Q-X1)/(Q-X2)

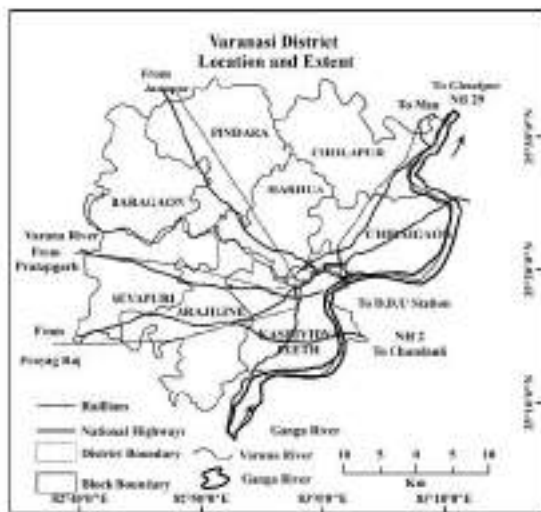Where X2 is male work participation rate

Figure 1: Administrative Boundary of Varanasi District

and X1 is female work participation rate and Q is constant with the value of 100. In case of perfect equality i.e. no disparity at all, the value of D will be zero. The measured value of D is interpreted as higher the value of D is higher disparity and lower the value is a lower disparity. Based on this calculation, the disparity of this region is divided into three-level as Low, Medium, and High. Tables and charts are prepared with the help of an Excel data Worksheet.

Results and Discussion:

Based on the Sopher disparity index output, Varanasi district is categorized in three-level as High, Medium and Low on the total, rural and urban population basis.

Spatial Distribution of Population in Varanasi District:

Varanasi district comprises both urban and rural population and this population also vary

Table1: Block wise gender disparity index among the total population

Sl. No.	Blocks	Population			Working Population			Work Participation Rate (%)			Sopher Index (D)
		Total	Male (%)	Female (%)	Total	Male	Female	Total	Male	Female (X2)	(X1)
1	Baragoan	232759	50.14	49.86	85584	54474	31110	36.77	46.68	26.81	0.28
2	Pindara	275679	50.61	49.39	94179	61443	32736	34.16	44.04	24.04	0.30
3	Cholapur	238945	51.45	48.55	75695	54530	21165	31.68	44.35	18.25	0.42
4	Harhua	271005	52.22	47.78	89589	66215	23374	33.06	46.79	18.05	0.45
5	Sevapuri	234392	51.63	48.37	76021	54240	21781	32.43	44.82	19.21	0.40
6	Arajiline	369043	52.30	47.70	125051	90803	34248	33.89	47.04	19.46	0.42
7	KashiVidya-peeth	17323	52.93	47.07	568763	459524	109239	32.83	50.12	13.40	0.61
8	Chiraigoan	322652	52.76	47.24	105826	80005	25821	32.80	47.00	16.94	0.48
	Total	36768	52.27	47.73	12207	921234	299474	33.20	47.93	17.06	0.49

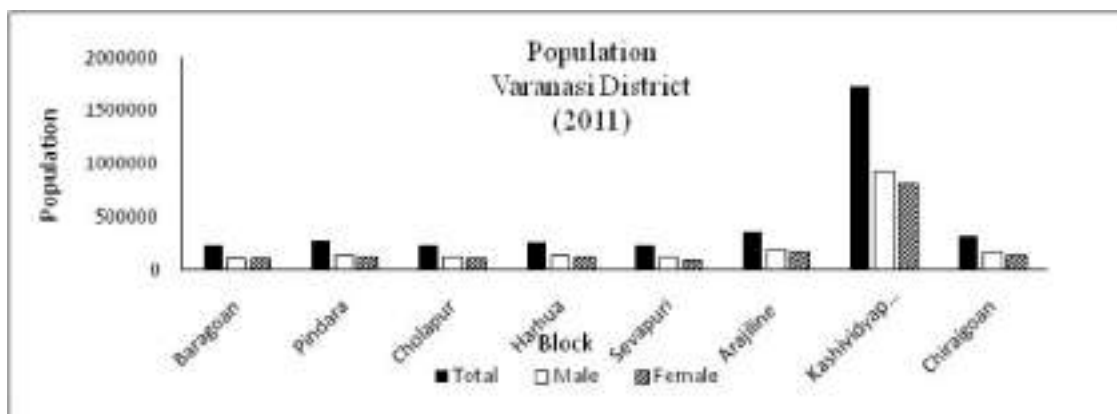Source: Calculated by authors from District Census Handbook, 2011

Figure 2: Block wise population of Varanasi district

block to block. The total population of Varanasi district was 3676841 in 2011, which comprises 52.27% male and 47.73% female population.

In total population, the highest population is concentrated in Kashividyapeeth (1732366) block, which comprise 52.93% male and 4 7.03% female population. Baragoan (232759) has the lowest population concentration, which comprise 50.14% male and 49.86% female population. Other blocks, Arajiline (369043),

Chiraigoan (322652), Harhua (271005), Pindara (257679), Sevapuri (234392) and Baragoan (232759) followed respectively. And the numbers of male and female population followed high to low population respectively. Kashividyapeeth has the highest concentration of population due to the highly urbanized area. This populations follow decreasing patterns from high urbanized areas to rural populations and east to west (Table 1 & figure 2).

Table 2:Blockwise gender disparity index among the rural population

Sl. No.	Blocks	Population			Working Population			Work Participation Rate (%)			Sopher Index
		Total	Male (%)	Female (%)	Total	Male	Female	Total	Male	Female (X2)	(D) (X1)
1	Baragoan	221376	50.03	49.97	81128	51549	29579	36.65	46.59	26.70	0.28
2	Pindara	275679	50.61	49.39	94179	61443	32736	34.16	45.12	23.46	0.32
3	Cholapur	238945	51.45	48.55	75695	54530	21165	31.68	47.84	17.21	0.47
4	Harhua	271005	52.22	47.78	89589	66215	23374	33.06	51.14	16.51	0.53
5	Sevapuri	234392	51.63	48.37	76021	54240	21781	32.43	47.84	18.00	0.46
6	Arajiline	317123	52.32	47.68	108488	78310	30178	34.21	51.79	18.19	0.49
7	Kashividya-peeth	258946	52.81	47.19	82888	65369	17519	32.01	53.49	12.81	0.66
8	Chiraigoan	262324	52.73	47.34	87430	64832	22598	33.33	52.20	16.36	0.54
	Total	2079790	51.76	48.24	695418	496488	198930	33.44	49.48	18.48	0.46

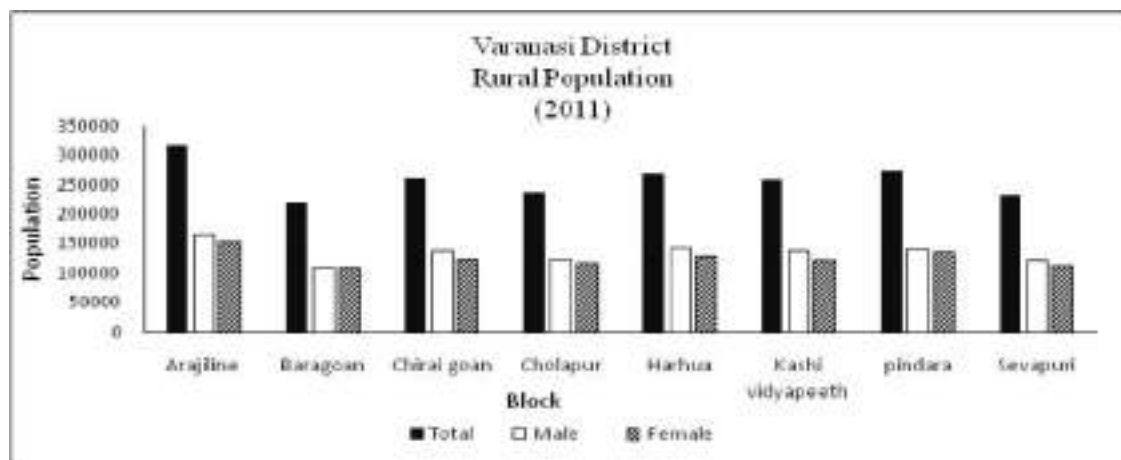Source: Calculated by authors from District Census Handbook, 2011

Figure 3: Block wise rural population of Varanasi district

In 2011, Varanasi district had rural population in all blocks, the total rural population was 2079790, which comprise 51.76% male and 48.24% female population. The highest population was in Arajiline (317123) block, which comprise 52.32% male and 47.68% female population. Baragoan (221376) had the lowest population which comprise 50.03% male and 49.97% female population. After Arajiline this popula-

tion is followed byPindara (275679), Harhua (271005), Chiraigoan (262324), Kashividyapeeth (258946), Cholapur (238945), Sevapuri (234392) and Baragoan (221376) respectively. In the condition of male and female populations, this follow the same pattern of high to low total population (Table 2, figure 2&3).

In 2011, there were 4 blocks out of the total

Table 3: Blockwise gender disparity index among the urban population

Sl. No.	Blocks	Population			Working Population			Work Participation Rate (%)			Sopher Index (D)
		Total (%)	Male (%)	Female	Total	Male	Female	Total	Male (X2)	Female (X1)	
1	Baragoan	11383	52.30	47.70	4456	2925	1531	39.15	53.86	28.19	0.33
2	Pindara	-			-	-	-	-	-	-	-
3	Cholapur	-			-	-	-	-	-	-	-
4	Harhua	-			-	-	-	-	-	-	-
5	Sevapuri	-			-	-	-	-	-	-	-
6	Arajiline	51920	52.22	47.78	16563	12493	4070	31.90	50.36	16.41	0.52
7	Kashividya-peeth	1473420	52.95	47.05	485875	394155	91720	32.98	56.86	13.23	0.68
8	Chiraigoan	60328	53.22	46.78	18396	15173	3223	30.49	53.76	11.42	0.71
	Total	1597051	52.93	47.07	525290	424746	100544	32.89	56.50	13.37	0.67

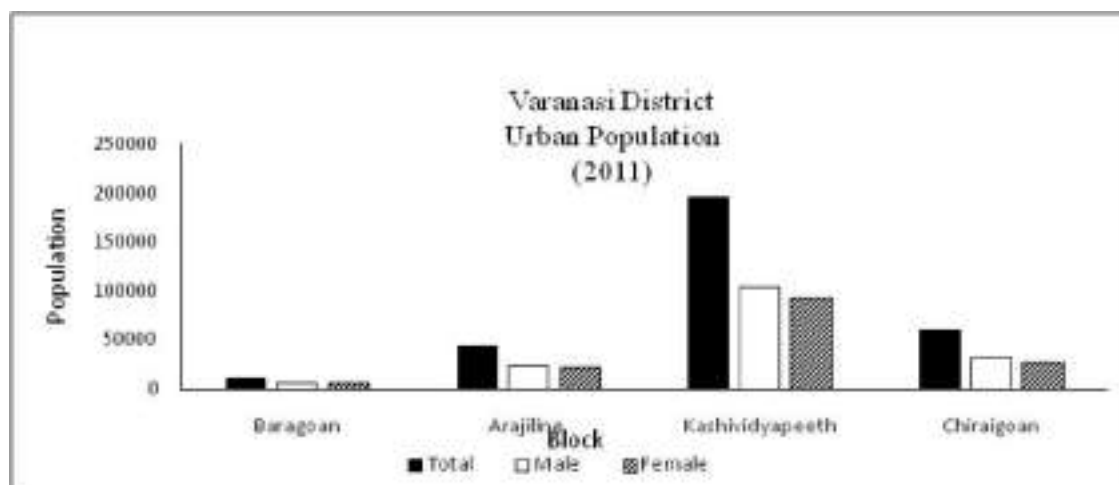Source: Calculated by authors from District Census Handbook, 2011

Figure 4: Block wise Urban population of Varanasi district

that had an urban population. Which was 1597051 population comprise 52.93% male and 47.07% female population. That's were Chiraigoan, Kashividyapeeth, Arajiline, and Baragoan blocks. Kashividyapeeth (1473420) had the highest population which comprise 52.95% male and 47.05 female population. And Baragoan (11383) had the lowest population which comprises 52.30% male and 47.70% female population. And these blocks were followed by Chiraigoan (60328) and Arajiline (57920) which comprise 52.22%,53.22% male and 46.78%,47.78% female population respectively. The highest number of urban populations shows a highly urbanized area (Table 3, figure 2&3).

Table 4: Block wise Gender Disparity Index

Sl. No.	Index	Level	Blocks		
			Total	Rural	Urban
1	0.28 - 0.43	Low	Cholapur, Sevapuri,	Pindara, Baragoan, Pindara, Baragoan	Arajiline Baragoan
2	0.43 - 0.58	Medium	Harhua, Chiraigoan	Cholapur, Sevapuri, Arajiline, Harhua, Chiraigoan	Arajiline,
3	0.58 - 0.73	High	Kashi- vidyapeeth	Kashividyapeeth	Chiraigoan, Kashi-vidyapeeth

Source: Calculated by authors

Region of High Gender Disparity:

Among the total population, Kashividyapeeth (0.61) has high gender disparity in Varanasi, which constitute 13.40 % female work participation rate against 50.12% male work participation rate (table 1&4), among the rural population, the same region has high gender disparity with 0.66 disparity index, which constitute 12.81 % female workparticipation rate against 53.49 % male work participation rate (table 2 and 4) and among the urban populationKashividyapeeth (0.71) present high gender disparity which constitute only 11.42 % female work participation rate against 53.76 % male work participation rate and Chiraigoan (0.68), which constitute very high gender disparity with 13.23 % female work participation rate against 56.86 % of male work participation rate consequently.
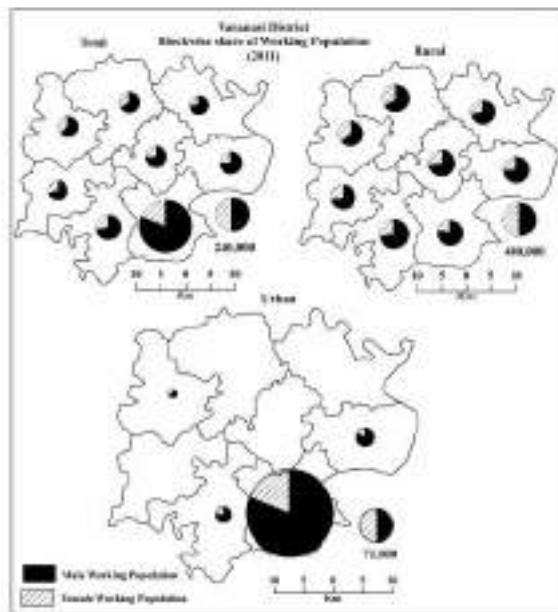

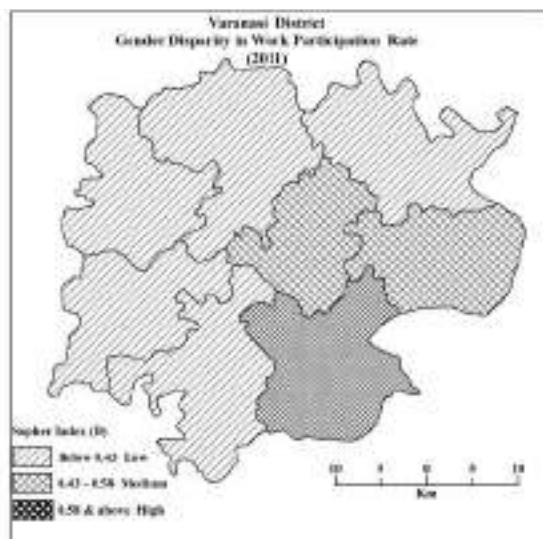Figure 5: Block wise share of working population

Figure 6: Block wise Gender Disparity in Varanasi district

Kashividyapeeth is urban nuclei of Varanasi district, where 14.7 lakh people are live. Urban areas are very less availability of primary sector activities, which provide fewer job opportunities to female and city areas is fully based on infrastructural development which has a high demand of male workers due to hard and risky works. This block is an educational hub where renowned universities like Banaras Hindu University, Mahatma Gandhi Kashi Vidyapeeth are situated, these universities directly/ indirectly, by education and by profession effect gender disparity because late joining of economic activities. This zone is fully based on secondary and tertiary activities which provide high income to the working population that discourages females to participate in economic activities rather than domestic work. Another service sector like transportation, business, market system, and shops has highly dominance of the male population and there is little scope to the female population in the hospitality sector and retail enterprises, nursing sector and maid, etc. Another cause of high gender disparity in the urban population is a late entry in the working sector of urban dwellers. Chiraigoan block consists rural and urban population, in the urban region due to unavailability of safe and equal job opportunity for women in the urban area increase the disparity of urban population.Male population adopts a cyclic migration towards the city to get a job but the female population is less able to do.

Region of Medium Gender Disparity:

Among the total population of Varanasi, Harhua (0.45) and Chiraigoan (0.48) has medium gender disparity in the work participation rate (table1 and 4). Harhua constitutes only 18.05 % female work participation against 46.79% male work participation, Chiraigoan constitutes 16.44 % female work participation against 47.00 % male work participation rate.

Among the rural population, Harhua (0.53) and Chiraigoan (0.54) have remained in the same group and another block Cholapur (0.47), Sevapuri (0.46), and Arajiline (0.49) show medium gender disparity. Harhua constitutes 16.51% female work participation against 51.43% male work participation, Chiraigoan constitutes 16.36 % female work participation against 52.20 % male work participation, Cholapur constitute 17.21% female work participation against 47.64% male work participation, Sevapuri constitute 18.80% female work participation rate against 47.84% male work participation and Arajiline constitute18.19% female work participation rate against 51.79% male work participation rate,(table 2 and 4). Among the urban population, Arajiline (0.52) is representing as the region of medium gender disparity with a 16.41% female work participation rate against 50.36% male work participation. Chiraigoan block comprises urban and rural populations and highly urbanized blocks cause higher gender disparity due to unavailability of primary activities and safe and sound environ-
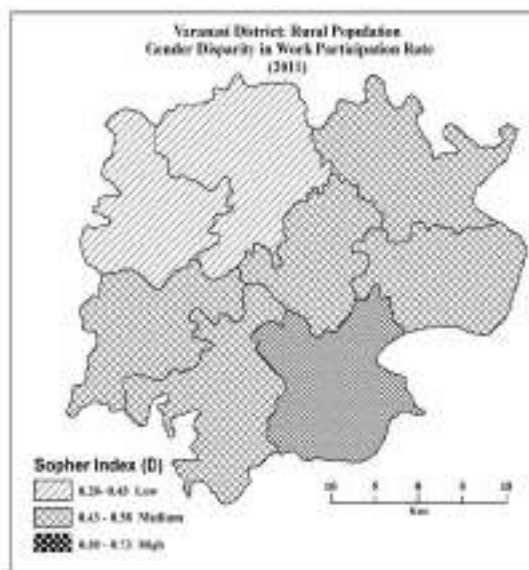
Figure 7: Block wise Gender disparity among the Rural population of Varanasi district

Figure 8: Block wise Gender disparity among the Urban population of Varanasi district

ment, high paid and status wise job. Each block has a less proportion of the female working population (table1, 2 and 3) so this disparity becomes high in urban block and it is increasing with going towards highly urbanized blocks.

Region of Low Gender Disparity:

Among the total population of Varanasi, Baragoan (0.28), Pindara (0.30), Sevapuri (0.40), Arajiline (0.42) and Cholapur (0.42) have low gender disparity, which constitutes 26.81 %, 24.04 %, 19.21%, 19.46% and 18.25% females work participation rate against 46.68%, 44.07%, 44.82%, 47.04% and 44.35% male work participation rate respectively (table 1, 4 & Fig. 7). Among the rural population, Pindara (0.32) shows low gender disparity, which constitutes a 23.45% female work participation rate against 45.12% male work participation rate. among the urban population, Baragoan (0.33) shows low gender disparity which constitutes 28.19 % female work participation rate against 53.89 % male work participation rate (table 3, 4 &fig.4).
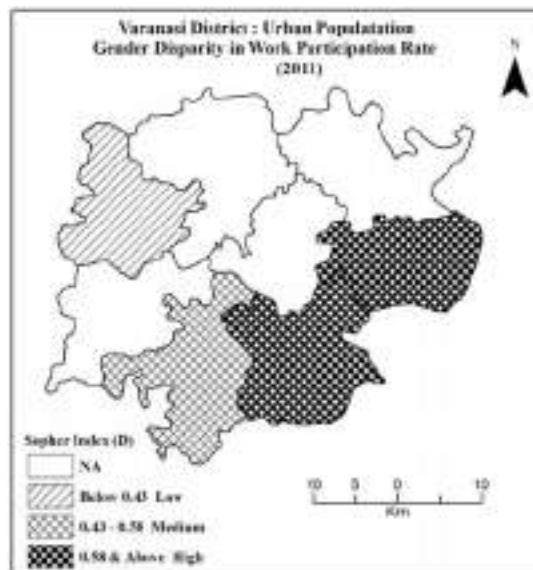
This shows that there is not a single block, which has an equal female working population in Varanasi district. This disparity increases in the urban area because of the unavailability of jobs in the primary sector i.e., agriculture which provides a higher number of job opportunities in rural areas without any high level of physical risk (Fig. 2,3 & g). Another cause of higher gender disparity in the city's areasare a high paid job of manwhich bar women to participate in economic activities rather than housewives.

Conclusion:

This present study shows a higher gender disparity in the work participation rate among the total(0.49)both rural (0.46) and urban (0.67) areas. This disparity is comparatively higher in the urban area. But at all, female work participation is in severe condition. This lower participation affects the economy, demographic condition and living standards of a female as well as their children. This gender disparity is in worst condition in city because of unavailability of primary activities and higher demand of technical

and heavy workers, this study suggests some measure to reduce gender disparity by providing facilities like maternity leave, quality of employment, eliminate unequal treatment, change to patriarchal mindset, high job opportunity, safe environment, effective wages, training of technology, government policy, and initiatives, and employment security, etc.

References:

Census of India, 2011, *District census Handbook of Varanasi,* XII-B, Uttar Pradesh, Jangarna Bhawan, Lucknow.

Census of India, 2011, Workers and Work Participation Rate, *Analytical report on Primary Census Abstract,* Government of India, New Delhi.

Chandra, J., 2018, No rise in working female despite high literacy levels, *The Hindu*, December 24, 2018, pp.8.

Choudhary, R.K., 1987, Supply of Work Effort by Female in India-How Equal is their contribution of Benefit Sharing? *Economic Association,* 70th Annual conference, Jaipur.

City Development Plan for Varanasi- 2041, 2015, *Capacity Building for Urban Development Project,* CRISIL Limited Mumbai.

Das, S., 2015, Female Worker in India: Why so few Among so Many? *Asia and Pacific Development,* IMF.

Devi, L., 1982, *Status and Employment of Female in India,* B.R. Publishing Corporation, Delhi.

Heath, C., 2000, *Recovering Work Practice and Informing System Design workplace studies.* Cambridge University Press.

Kala, R., 1976, *Role Conflict in Working Women,* Chetana Publications, New Delhi.

Kapur, P., 1974, *The Changing Status of Working Female in India,* Vikas Publication, New Delhi.

Lahoti, R., and Swaminathan, H., 2013, Economic Growth and Female labor workforce participation in India, *Indian Institute of Management Bangalore,* 414, India.

Nath, K., 1970, Female Work Participation and Economic Development, *Economic and Political Weekly,* 5(21), p. 846.

Banerjee, N., 1989, Trend in Women's Employment- Some Macro Level observation, *Economic and Political Weekly,* April, pp.71-81.

Ramachandran, R., 1964, Attitude of Women in Part-time Employment, *Development of Social Science Research, Tata Institute of Social Sciences,* Bombay.

Schlozman, K. L. and Burns, N., 1994, Gender and the Pathways to Participation: The Role of Resource. *The Journal of politics,* 56(4): pp.963-990.

Singh, A, 2017, Occupational Variation in Durgapur City, West Bengal, *National Geographical Journal of India.* 63(1): pp. 62-70.

Singh, K.P., 1979, Status of *Female and Population: Growth in India,* Munishiram Manoharlal Publication, New Delhi.

Trewartha, G.T.,1969, Geography of Population, *Annals of the Association of the American, Geographers,* 43.

Verick, S., 2014, Female Labour Force Participation in Developing Countries, *ILO, India and IZA,* World of Labor, Germany.

Waris, A., and Bandumula, N., 2016, Gender gap and workforce participation in agriculture in Andhra Pradesh, *India African journal of agricultural research,* 11(9): pp.769-778.

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Book Review

Sugar industry is based on sugarcane that was discovered thousands of years ago in New Guinea. The way was traced to India where in it first begins with the production of sugar after extracting juice and boiling it to get modern crystal sugar. The government of India in 1950-51 made industrial development plans and has set many targets of production and consumption of sugar. Currently, India is the second largest producer of sugarcane after Brazil. There are about 4 million hectares of land under sugarcane cultivation with an average yield of 70 tonnes/hectare. In 1903, there was an advent of modern sugar processing in India and first sugar mill (United Province Sugar Company) started at Pratappur (Deoria) in Uttar Pradesh with grant of tariff protection to the sugar industry. After independence 1947, planning for industrial development began and Government fixed targets for sugar production and consumption, licensed and installed capacity, sugarcane production during Five Year Plan periods. After 1985, Indian sugar industry faced many ups and downs. Many problems related to sugarcane cultivation as well as sugar mills adversely affected the production but also weakened the integration cane farming and sugar manufacture. In the last decade, sugarcane production recorded declining trend due to disinterest in its farming among farmers. This may be attributed to price instability, consumer behaviour towards sugar, use sugarcane farms for cereals/ cash crops etc..

Author attempted to analyse the growth and development of this industry and identify linkages and prospects of the industry with its ancillaries including impact of pollutants on surroundings.

Conceptual Framework presents a critique concepts, industrial linkages, factors of localization, industrialization in India and policies concerning sugarcane production and sugar manufacture. It is followed by issue of industrial resource base and related infrastructure. He examined the factor of considering sugarcane as the main cash crop in this region wherein 30 sugar mills are working. Total production of sugarcane is more than average in the districts located in Saryupar plain as compared to Trans Ganga, Ganga-Ghaghra doab and southern areas. Thus, despite high per hectare production, these districts do not have high production due to lack of interest among farmers for sugarcane cultivation. Three significant regions of sugarcane cultivation have emerged i.e., i) a cluster of four districts Kushinagar, Balrampur, Gonda and Basti, ii) districts located in the south and, iii) south-west Ganga-Ghaghra doab. There is no shortage of labour but definitely dearth of skilled labour. The wage-earner/ unskilled labourer can easily shift from one industry to another unlike skilled labourers for their kinds of skills.

It is followed by analysis of spatio-temporal background of the area for the development of sugar industry, phases and levels of development. Author identified five phases considering the trend of the establishment of sugar factories, i.e., initial phase (up to 1943), dark phase (1944-68), slow growth (1969- 82), increasing growth (1983- 2003) and decreasing growth (2004-2012). Spatial pattern of development show that, sugar factories are mostly located in the Saryupar plain. Therefore, all the clusters of sugar industry have emerged and developed around these centres. The remaining districts do not any large scale sugar mill excepting distilleries as ancillary to the sugar industry. Besides, small scale sugar units (Crushers and Kolhus) are developed in most of the districts. Thus, diversification and decentralization of the industry is demand of lime. He attempted to divide region into levels of development of sugar industry. Kushinagar, Bahraich, Gonda and Gorakhpur districts included region of high development, followed by regions of moderate and low development.

Subsequently, author explored the silent features of spatial distribution of sugar mills making use of clusters analysis and industrial linkages. The heavy sugar mills took place between 1903-43, 1969-88 and after 2004. Further, two and half decades (1943-69), didn't witnes establishment of new units. After 1969, sugar industry got momentum. He considered the number of units and employment recognizes such industrial clusters. One major cluster (Kushinagar-Deoria-Gorakhpur-Maharajganj), three minor clusters namely, (A) Bahraich, (B) Basti-Khalilabad and (C) Gonda- Balrampur emerged. Besides, many small centres of sugar industry also emerged in Faizabad, Sultanpur, Ambedkarnagar, Ballia and Ghazipur etc. It is evident that distribution of sugar industry follows the availability of raw materials (Sugarcane production) as propounded in the Weber's theory of industrial location. The gross and localised raw materials attract the industries to be located near source due to enhancement in transportation cost.

Further, he focuses on causes of industrial sickness and environmental problems caused by sugar industry. Many problems related to sugarcane cultivation as well as sugar mills are not only lowering sugarcane production but also weakening the integration between sugarcane production and sugar mills. The investigator revealed that unfavourable government policies and over taxes were major impediments followed by financial problem, old and unrepaired machineries and neglected from management. Latest challenges are competition from modern sugar mills, quality of sugarcane and locational issues.

Besides, he has attempted to assess the environmental impacts of sugar industry on surrounding areas with 400 households surveyed from 10 villages nearby 5 sugar mills. Respondents informed the impact of smell, smoke, fly ash, water pollution, noise pollution, waste disposal etc. on environment of their vicinity.

Finally he attempted to assess the potentials and suggest strategies for development of sugar industry in eastern Uttar Pradesh. On the basis of cane surplus five new sugar mills are suggested and revival of four sick sugar mills. Study reveals that factories having machineries and buildings in good condition would easily be restarted. For the further balanced development of sugar industry, author suggested that the Government must come forward to provide financial support

to restart the closed mills. The authority should regulate the situation arising as the 'know in the sugar industry' and solve the problem at the earliest. Timely assistance is essential in agriculture as "anything can wait but not agriculture". For the high recovery, it is necessary that mills directly involve in sugarcane production, transportation and supply fresh sugarcane. Small sugar units must promote Gur and Khandsari and make its own packaging system for its products and must be provided financial support for its further development and change old technology.

Author has given summary and conclusion of the work followed by bibliography and an index. Language of book is alright. This book covers only few key issues of sugar industry. Despite, this fact book would be of immense use to the students, researchers, policy makers and non-governmental organizations. Maps and tables included are vital and provide desired strength to the book.

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