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SOCIO-ECONOMIC DETERMINANTS OF RURAL INDUSTRIALISATION IN EASTERN UTTAR PRADESH

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ABSTRACT

The Eastern region of reorganized State of Uttar Pradesh is one of its most backward areas. This region is characterised by inadequacy of human resource development, besides having a poor opportunity structure. Agricultural productivity is very low and diversification is possible only by promoting rural industrialisation, which by offering dynamic benefits will help change the traditional structure of a backward economy. In the present paper an attempt is being made to examine the importance of selected determinants, namely, human capability, infrastructure, urbanisation, and commercialisation of agriculture to rural industrialisation (CR) in 1991,2000, 2008 through multiple regression analysis of linear form for the Eastern region as a whole and two categories of 27 districts delineated on the basis of level of CR in 1991.Urbanisation turns out to be the most important influencing variable of rural industrialisation in the region. The need is, therefore, to bring vital elements of the city to the countryside to start the process of rural industrialisation in a dispersed manner.

KEYWORDS

Capability levels, infrasturucal base, urbanisation, commercialisation, rural transformation, growth centres, composite indices, cross-sectional data, village and small industries.

INTRODUCTION

Backward areas are characterised by excessive pressure of population on land and the Eastern region of Uttar Pradesh is no exception, with almost 65 per cent of its population being dependent on agriculture for its livelihood. The capacity of agriculture to productively absorb increasingly larger rural labour force is not unlimited owing to the fixity of land and operation of diminishing returns. This is reflected in a low per capita agricultural productivity of Rs. 2,866 in 2005-06 obtained in the region, being the lowest among all the other economic regions of Uttar Pradesh.[1]

Thus, the expansion of modern industrial sector with thrust on employment generation, infrastructural, institutional and attitudinal benefits on the traditional economy is *sine-qua-non*. Concomitantly, however, transfer of surplus labour from rural to urban areas is not as smooth and costless as most of the internal migration models have prophesized. There is a loss of agricultural production at the point of origin and apart from skill bottlenecks, significant capital and social costs are involved at the point of destination.[2] Further, the modern sector finds itself incapable of expanding at a pace so as to gainfully employ the influx of surplus labour from agriculture due to its lower employment elasticity and the intensification in migration with every employment generation due to urban-rural expected income differentials, exacerbating the urban unemployment problem as well.[3]

Given this scenario, the only recourse left for addressing the problem of both rural and urban unemployment is to make rural economy viable economically through its diversification in terms of output and employment growth, besides equitable distribution of incomes. The principal instrument of such diversification, *inter-alia*, is by promoting rural industrialisation, which by offering dynamic benefits will help change the traditional structure of a backward economy.

RURAL INDUSTRIALISATION: AN OVERVIEW

While conceptualising the term "rural industrialisation" one has to consider the type of industry to be incorporated and their location and size in terms of investment. The usual notion of including only artisanal and household based activities, making use of local skills and materials and catering to local market, as falling under the purview of rural industries, will tend to have smaller linkage effects, thereby confining advantages to smaller pockets only. If the aim is to benefit rural people at a larger scale through income and employment generation and for a better inter-regional development, introduction and promotion of small scale manufacturing enterprises (but not necessarily cottage based ones only) should essentially mean rural industrialisation.[4] Similarly, according to Haan rural industries should incorporate both the traditional industries as well as the modern enterprises. While the former is mainly consisting of household industries, using traditional technology, local materials and catering mainly to local demand with the exception of handicrafts manufacturing especially for exports. The latter although small in size, use technology resembling that is being used in big modern factories producing non-traditional products and catering mainly to non-local demand.[5]

As far as the location is concerned, rural industrialisation cannot be confining to villages only, if the aim is to benefit the lives of local people. According to UNDP, where transport, infrastructure and the marketing and trade network are well developed or where general urbanization is vividly marked, larger urban areas may be regarded as locations for rural industries, as long as such areas provide comparable environment to small towns.[6]

The practical definition of rural areas varies from country to country. While in case of advanced countries rural areas are those having a population of up to 20,000 or 30,000, whereas in developing countries like India areas having population up to only 5,000 are termed to be rural. With a high rate of natural increase, very often this limit is exceeded with newly urbanised areas retaining their rural characteristics. Small enterprises in such areas should also be considered as rural industries, irrespective of absolute population figures. Thus, according to Islam, 'if people in villages have access to employment opportunities available in nearby small rural towns or market centres (or the so called 'rural growth centres' as they are often termed), such locations should also be covered by the term rural.

As for the size of industries to be incorporated in rural industries is concerned,the general perception is to incorporate only small scale cottage based units. Besides, employment is not the only consideration and the process of rural industrialisation does not only have to involve people as labourers, but also as entrepreneurs. This is possible if size of industries to be incorporated is relatively small. Thus, rural industrialisation can be conceived in terms of introduction and promotion of small scale industries, irrespective of their locational restrictions.

Aiming at integration of small and medium enterprises, and also facilitating their growth and enhancing their competitiveness a Micro, Small and Medium Enterprises Development (MSED) Act was passed in the year 2006. This act provides first ever legal framework for recognition of the concept of 'enterprise' comprising both manufacturing and services and integrating the three tiers of these enterprises, i.e., micro, small and medium. Under this act, enterprises have been categorised broadly into those engaged in: (i) manufacturing, and (ii) providing/rendering of services. Both have been further classified into micro, small and medium enterprises, based on their investment in P&M (for manufacturing enterprises) and equipment (enterprises providing/rendering services).

Under manufacturing enterprises category, micro enterprises, small enterprises and medium enterprises are those having an investment upto Rs.25 lakh; above Rs.25 lakh and upto Rs.5 crore; and above Rs.5 crore and upto Rs.10 crore, respectively. For service enterprises, micro-enterprises are those having investment upto Rs.10 lakh; small enterprises are those having investment above Rs.10 lakh and upto Rs.2 crore and medium enterprises are having above Rs.2 crore and upto Rs.5 crore.[8]

DEFINING RURAL INDUSTRIALISATION IN THE PRESENT CONTEXT

Choice of small scale industries as a proxy of rural industries seems to be logical and supported by several studies. For defining rural industrialisation and its level in the present context, the total vector of seven indicators have been selected for construction of Composite Index of Rural Industrialisation (CR). The choice of these variables is confining to registered SSIs only, due to data constraint. Besides, the detailed district-wise data being published on registered SSIs by Directorate of Industries, Kanpur does not provide information on production and exports. Therefore, the value added indicators are confining to total manufacturing only.

However, hopefully this will not affect the CR unduly as SSIs' share in number and employment of the total registered manufacturing sector in the Eastern Uttar Pradesh is more than 80 percent. Thus, the selected indicators, representing the concentration of employment and investment and also the productivity in registered SSIs, are indicative of the performance of total manufacturing sector. These consist of: (i) number of registered SSIs per lakh of population; (ii) number of workers engaged in registered SSIs per lakh of population; (iii) investment per worker in registered SSIs; (iv) percentage contribution of manufacturing to total Net District Domestic Product; (v) Net value added by manufacturing per capita; (vi) Net value added per worker in registered manufacturing (SSIs + Heavy Industries); and (vii) percentage of net value added from registered manufacturing to net value added from total manufacturing. With the help of these variables, using the index method we have constructed CR for each district of the Eastern region to represent district-wise levels of rural industrialisation.

CHOICE OF VARIABLES AND METHODOLOGY

The process of industrialisation and its pivotal role in development and social transformation is an outcome of the interplay of numerous factors broadly covered under economic, social, political and environmental aspects. The important among them can be listed as: (i) natural, material and human resources, including human capability; (ii) economic and business environment determining factors, such as, infrastructure including markets, institutional arrangements, agriculture and urbanisation; and (iii) political set-up and the dispensation of the public policies. Some of these factors are measurable, while some others are not. In view of this, for purposes of empirical analysis in the present case, only quantifiable socio-economic variables have been selected. Thus, the determining variables of rural industrialisation (CR) as identified here consist of (i) human capability defined in terms of human development index (HDI); (ii) composite index of economic infrastructure (CEI), (iii) degree of urbanisation (U); and (iv) commercialisation of agriculture (CA). Besides, one more variable included in our total analytical framework is (v) composite index of infrastructure (CI), which is arrived at by combining composite index of economic infrastructure (CEI) and composite index of social infrastructure (CSI).

Rural industrialisation, which has been selected as the dependent variable, can be conceived as a diversification of the rural economy through introduction and promotion of tiny sector, village and small scale industries (SSIs). Among the independent variables, human capability is considered to be the most crucial. The focus of development has, in recent times, shifted from unidimensional material progress in terms of GNP (single choice) to multi-dimensional measure of socio-economic progress (multiple choices), incorporating in itself the indicators of human welfare as well. This is because human beings are not only economic agents of the growth process but, are also the main beneficiaries of the gains of its progress. Human development, *per-se*, is taken as an expansion of human capabilities, a widening of choices, an enhancement of freedoms and a fulfillment of human rights,[9] so that people can lead the lives they have the reason to value the most. The most critical choices are (i) to lead long and healthy lives; (ii) to be educated; and (iii) to enjoy a decent standard of living.

UNDP has provided a standard methodology for capturing these choices in terms of a composite index called Human Development Index (HDI), with enough margins for improvements and modifications, within a flexible framework. For the State of Uttar Pradesh two Human Development Reports(UPHDRs) have been published so far with detailed district-wise HDI values provided for the years 1991, 2001and 2005 within UNDPs broad methodological framework, [10] which have been used as an indicator of human capability in the present paper. However, there are some differences in selected variables as per data availability at district level and suitability in light of State's specific considerations. For arriving at the education index figures of literacy at age 7 are used. The indicator of combined gross enrollment data is not used due to inadequacies in the reported data. Most advanced countries do not produce literacy data and are assumed to have literacy rates closer to unity leading to bunching at top and almost similar index for educational attainment. It is also said that since literacy measures the stock of a Nation's education, it thus does not capture the flow of education being achieved.[11] To take care of all these inadequacies, and to discriminate between the countries at top a second indicator of gross enrollment ratio was incorporated by UNDP in their HDRs.

At the very basic capability levels, however, literacy rates are fairly representative of knowledge for a number of reasons. Firstly, literacy rates are found to be considerably less than unity with large inter-regional and intra-regional variations. Secondly, it follows from the above that many of these countries are still struggling with low level of literacy, and are, therefore, not in a position to think about the specialised knowledge in a big way. Thirdly, the literacy figures available for India and its States including Uttar Pradesh are for "persons aged 7 years and above."These figures for 1991 and 2001 are taken from the Census, whereas for 2005 these have been extrapolated (minimum and maximum values are taken as 0 and 100).

For estimating the health index, infant mortality rate (IMR) data has been used instead of life expectancy at birth. It has often been argued that life expectancy at birth is closely associated with both income and IMR. Hence, as income is already included in HDI, IMR should be used instead of life expectancy.[12] Besides, prevailing paucity of data at the micro-level makes the task of measuring longevity very difficult. District-wise data for U.P. are available only for 1981 and 1991. In UPHDR IMR for 2001 and 2005 are the derived rates based on RCH surveys. Minimum and maximum values taken are 10 and 100 respectively based on current and past observed IMRs in India and U.P.

Income is taken as a surrogate of all those capabilities which are not captured in health and education index. For estimating the income index UPHDR makes use of adjusted per capita income in PPP$. The district per capita income in PPP$ equivalent is derived from district per capita income at constant prices in Rs, multiplying with ratio of per capita GDPin PPP$ in India and per capita GDP in Rs. in India for several years. Further these figures are converted to logarithmic form, from which income index is estimated with minimum and maximum values being log (100) and log (40000) respectively. HDI of j^{th} district is a simple arithmetic average of the three attainment indices as follows

$$\text{HDI} = \frac{1}{3}\sum_{i=1}^{3}\frac{X_{ij} - \min X_{ij}}{\max X_{ij} - \min X_{ij}}$$

An other equally important independent variable included in our framework is infrastructure or 'social overhead capital' (SOC). It is defined as those basic services and public utilities, which are essential for various kinds of economic activities in primary, secondary and tertiary sectors.[13] Without infrastructure, development is inconceivable; it assists in augmenting directly productive activities (DPA) by providing not only significant external economies but also the foundation for these activities to flourish. This crucial variable can broadly be divided into two – economic and social infrastructure. Both are essential for an accelerated, all-encompassing socio-economic development. The positive role of public spending on roads, power, irrigation, education, health, etc. in productivity improvement and reduction in incidence of poverty is well established.[14]

Due to its overwhelming importance, a massive investment on infrastructure had been made under various Five Year Plans of Uttar Pradesh. In spite, the State is still characterised by inadequacy of infrastructure and inefficiency in its use. The available literature on the subject points out that inadequacy of infrastructure, especially erratic and irregular supply of power, happens to be the main reason for low productivity levels as observed in case of the SSIs of the Eastern region. This basic lacunae has already been corroborated by the U.P.'s Five Year Plans and several other studies.[15]

Inadequacy of infrastructure and inefficiency in its use, probably because of weak institutions[16] in the State and its regions, calls for an in-depth analysis of its role in the rural industrialisation of the Eastern region. In the present case, CI is based on a total vector of twelve indicators, six comprising components of CEI and the remaining six of CSI. These, per lakh of population, are: (i) length of pucca roads under PWD; (ii) percentage of villages electrified to total number of inhabited villages; (iii) number of scheduled commercial banks; (iv) number of rural markets; (v) number of industrial estates/areas; (vi) number of telephone

lines;(vii) number of Junior Basic Schools; (viii) number of Senior Basic Schools; (ix) number of Higher Secondary Schools; (x) number of Allopathic Hospitals/Dispensaries including PHCs; (xi) number of polytechnics; and (xii) number of ITIs. For estimating CI simple index method has been used.

In addition, urbanisation, which refers to the proportion of urban population to total population, is an indicator of transformation of the economy from agrarian to non-agrarian and from traditional to modern. It is well established fact that economic development in developing economies is, by and large, contingent upon introduction of industry and the process of industrialisation is closely associated with urban growth.[17] This is mainly because of cost advantages or agglomeration economies. These can take two forms – (i) urbanisation economies, which are the effects associated with the general growth of concentrated geographical regions; and (ii) locationalisation economies, which refer to the effects captured for the particular sectors of the economy and, often take the form of backward and forward linkages.[18] To put it more simply, industrial firms reap substantial cost benefits due to better access to infrastructure[19] and diversified market for labour and other inputs in an urban setting.

Developing economies like ours are, however, facing the problem of urban gigantism–an unhealthy structure of urbanisation, with a tendency of the population to concentrate in one or few mega cities. In contrast, the situation in the developed economies at the similar stage of development was different; with urban centres being greater in number and population distribution over these centres being more diffused.[20] The problem of urban gigantism leads not only to unbalanced regional development, but also gives rise to numerous social costs, like, the problem of housing and social services; increased crime, pollution and congestion. It becomes imperative for these countries to pursue the policies of urban decentralization, developing dispersed rural growth centres through a better designed infrastructure development programmes – roads, utilities and telecommunications. This will also go a long way in promoting rural urbanisation and a transformation of rural economies through technology and skill upgradation.

Moreover, the promotion of dispersed rural growth centres is essential for the growth and development of village and small scale industries. Rural industrialisation is not possible in an isolated pocket experiencing shortages of basic amenities including infrastructure. Besides providing villages with an access to urban amenities and assisting in rural development, rural workers commuting to nearby towns for employment are able to press the rural interests with the officials at the regional and the National level, thereby aiding in better and effective policy initiatives at the Governmental level.[21]

In view of the above, urbanisation, which is defined as percentage of urban population to total population, has been incorporated as one of the crucial independent variable in analytical framework of the present work.

For a sustained development of rural economy, integrated rural development with particular emphasis on agricultural development appears to be *sine-qua-non*. Agriculture alone can prove to be a dynamic source of growth, employment, equitable distribution of income and earning foreign exchange. Experiences of developed countries have shown that industrial revolution has been more widespread in countries like, Great Britain, Western Europe and North America, where vibrant agricultural sector with high agricultural productivity already existed. Nurkse has argued that a spectacular industrial revolution would not have been possible without the agricultural revolution that preceded it. Similarly, Rostow has stated that revolutionary changes in agricultural productivity are essential conditions for successful take-off.[22] Lewis was also of the opinion that limits to manufacturing were set by poor productivity levels of farmers whose marketable surplus was to exchange for manufactures.[23] Low agricultural productivity has often been cited as an important reason for sluggishness in Indian manufacturing.

A positive relationship between growth of agriculture output and growth of village and small scale industries has often been strongly advocated. In India, approximately 40 per cent of the raw materials is made available to SSIs by agriculture alone. The modernisation and transformation of agriculture accompanied by infrastructural facilities acts as a catalyst and stimulate rural industrialisation through input, output and consumption linkages.

Agricultural modernisation may be described in terms of a gradual but sustained transition from subsistence to diversified and specialised production, where sizeable part of the produce is sold in market to fulfill the demand of other needy households or business community. [24] Thus, agricultural transformation is found to be a crucial variable influencing pace and process of rural industrialisation, more so, in the agrarian economies. In the present case, commercialisation of agriculture defined as the percentage of area under commercial crops to gross cropped area, has also been included as one of the important independent variables.

OPERATIONAL AREA AND METHODOLOGY

In the present context, the operational area is confining to the Eastern region of Uttar Pradesh only, with district being chosen as a unit of analysis. The study is both temporal and cross-sectional in nature. The selected points of time are 1991 and 2000 and 2008.

To measure and analyse the contribution of selected independent variables to rural industrialisation (CR), the linear multiple regression models of following type have been used.

$$CR_i = \beta_o + \beta_1 HDI_i + \beta_2 CEI_i + \beta_3 U_i + \beta_4 CA_i + \mu_i \quad \text{..... Model I}$$

$$CR_i = \beta_o + \beta_1 HDI_i + \beta_2 CI_i + \beta_3 U_i + \beta_4 CA_i + \mu_i \quad \text{..... Model II}$$

Where,

CR = Composite index of rural industrialisation
HDI = Human development index
CEI = Composite index of economic infrastructure
CI = Composite index of infrastructure (i.e. CEI and CSI combined)
U = Urbanisation
CA = Commercialisation of agriculture
β_s = are estimated coefficients of the selected variables, with β_o representing the constant term
μ = is the error term; and
i = 1 ..... n, representing cross-sectional district-wise values of the selected variables.

The main hypothesis of the present paper is that there exists an inverse relationship between the selected independent variables, i.e., CEI, HDI, U, CA, CI and industrial backwardness. In other words, higher the level of human capability, infrastructure, and urbanisation higher would be the level of rural industrialisation. An attempt is being made here to examine the said hypothesis more rigorously by using the micro-level, district-wise data of the selected variables in the Eastern U.P. Further, all the districts of the region have been divided into two categories, namely, (i) relatively more industrialised; and (ii) relatively less industrialised on the basis of the slabs of CR placed hierarchically in descending order and taking the arithmetic mean of CR in 1991 as the dividing line.

A simple arithmetic mean separately for CR and the selected independent variables has been taken for each category to demonstrate inter-category differentials. Table 1 reveals the industrial backwardness of the Eastern region, as approximately 68 per cent of total 19 and 63 per cent of the total 27 districts respectively, in 1991 and 2000 fall in 'relatively less industrialised' category. Besides, the value of average CR for more industrialised category is found to be as low as 140.62 and 135.36 at the above mentioned points of time. Some improvement, however, is discernible in 2008 as 67 per cent of total 27 districts are found to be falling in more industrialized category-I and the value of average CR has shown significant improvement (162.16).

For the Eastern region as a whole, although the level of rural industrialisation is still low, an improvement is discernible at the latest selected point of time. An in depth examination reveals that in case of Category I – comprising of 6 districts in 1991, 10 districts in 2000 and 18 districts in 2008, the average value of all the selected socio-economic variables is significantly higher than in category-II. This reflects the poor status of the districts falling in Category II, which continue to suffer from low levels of human capability, poor social services, traditional agriculture and inefficiency in use of economic infrastructure. This, in turn, has caused a negative influence on the rural industrialisation of the region as a whole.

The slow-down in rural industrialisation in the Eastern region during the decade of Nineties and an improvement thereafter is broadly following the similar trend experienced at the State level during the same period. It has been observed that the economy of Uttar Pradesh, which was having very low total and sectoral growth rates prior to the Fifth Five Year Plan, began to experience a fairly satisfactory growth from the mid-Seventies to the end of Eighties. The industrial

growth during the Fifth, the Sixth and the Seventh Five Year Plans was 9.4 per cent, 9.4 per cent and 10.9 per cent respectively, as against a low growth rate of 3.4 per cent during the Fourth Plan. However, there was a sharp deceleration in the industrial growth at 4.2 per cent and 4.3 per cent respectively, during the Eighth and the Ninth Plans (i.e. period of 1992-2002). A turnaround, however, occurred and an industrial growth of 7.3 per cent was experienced in the State during the Tenth Plan period resulting in an ambitious target of 12 per cent in the same being envisaged during the Eleventh Plan.

TABLE 1: CATEGORY-WISE AVERAGE VALUES OF SELECTED VARIABLES (1991 – 2008)

Sl. No	Categories based on level of CR	No. of Districts	1991						No. of Districts	2000						No. of Districts	2008					
			CR-1	HDI-1	CEI-1	CSI-1	U-1	CA-1		CR-2	HDI-2	CEI-2	CSI-2	U-2	CA-2		CR-3	HDI-3	CEI-3	CSI-3	U-3	CA-3
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	High	6	157.59	0.43	122.02	102.49	14.52	10.73	10	135.36	0.54	117.35	107.69	16.95	10.07	18	162.16	0.54	106.99	96.99	13.28	11.50
2	Low	13	71.42	0.41	84.80	101.98	8.78	10.35	17	69.61	0.49	99.79	99.29	7.42	10.67	9	76.36	0.50	76.64	90.34	6.37	7.70
Eastern Region		19	98.63	0.42	96.55	102.14	10.59	10.47	27	93.96	0.50	105.93	102.39	10.95	10.45	27	133.56	0.53	96.87	94.77	10.98	10.23

Note: High-(CR>98.63);Low(CR<98.63).

1991 High: Varanasi, Sultanpur, Gonda, Allahabad, Mirzapur, Sonbhadra:

Low: Deoria,Faizabad,Siddarthnagar,Basti,Ghazipur,Gorakhpur,Maharajganj,Bahraich, Azamgarh, Mau,Ballia, Jaunpur&Pratapgarh.

2000 High: Varanasi,Sonbhadra,Allahabad,Mau,S.RavidasNagar,Mirzapur,Maharajganj,Ballia,Gorakhpur,Basti.

Low: Deoria,Chandauli,Sultanpur,Jaunpur,Faizabad,Bahraich,Ghazipur,Gonda,Azamgarh,Kushinagar,Pratapgarh,Balrampur, S.Kabirnagar, Siddarthnagar, Kaushambi,Ambedkarnagar,Shrawasti.

2008 High: Sonbhadra,Allahbad,Kaushambi,Varanasi,Balrampur,S.Kabirnagar,Sultanpur,S.Ravidasnagar,Mau,Gorakhpur,Faizabad, Mirzapur, Jaunpur,Gonda, Ballia,Deoria,Basti,Chandauli.

Low: Maharajganj, Bahraich, Ghazipur, Kaushambi, Pratapgarh, Azamgarh, Ambedkarnagar, Siddarthnagar & Shrawasti.

Source: Estimated on basis of data placed in Appendix Table 1.

The main reason for low industrial development in the State economy can be attributed partly to the decline in public investment due to a deep fiscal crisis and a consistent decline in Plan Outlays to industrial sector since the Eighth Plan. Further, despite the three policy announcements of 1998, 2002 and 2004 to attract private investment, the effort more or less went in vain due to non-congenial industrial climate in the State. Only 1.5 per cent Foreign Direct Investment (FDI) in the country has come to Uttar Pradesh, and, the major portion of new industrial investment has gone to relatively more developed districts of the Western region bordering Delhi. Due to paucity of funds for developmental purposes, infrastructure development suffers the most which reinforces the vicious cycle of less private investment. As is clear from table 1 excepting HDI, average values of all other variables have experienced a decline over selected time period.

On the basis of the above analysis, it can be concluded that the Eastern region is still characterised by industrial backwardness. However, if the investment climate is made congenial, and infrastructural bottlenecks are overcome, the region will be in a position to benefit from improved human capability levels, which will go a long way in reducing the severity of industrial backwardness in the region in the changed domestic and global scenario.

MULTIPLE REGRESSION ANALYSIS

Using multiple regression models, an attempt has been made here to examine and analyse the causal or functional relationship of the dependent variable, i.e. CR with those of selected independent variables, i.e., HDI, CEI, CI, U and CA in the Eastern region. The results of linear regression analysis for the Eastern region at the three selected points of time (i.e. 1991, 2000 and 2008) are presented in Table 2. In 1991, the coefficients of all the independent variables are positive, excepting HDI, which is found to be negative but statistically

TABLE 2: LINEAR MULTIPLE REGRESSION MODELS FOR EASTERN U.P.

No. of Observations: 27 **Dependent Variable: CR**

Sl. No.	Independent Variables	Model I									Model II								
		1991			2000			2008			1991			2000			2008		
		Coefficient	't' Value	Significance	Coefficient	't' Value	Significance	Coefficient	't' Value	Significance	Coefficient	't' Value	Significance	Coefficient	't' Value	Significance	Coefficient	't' Value	Significance
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	CEI	0.460	2.183	0.047	0.173	1.350	0.191	0.134	0.842	0.409	-	-	-	-	-	-	-	-	
2	HDI	-0.417	-1.542	0.145	0.181	1.163	0.257	-0.026	-0.128	0.899	-0.487	-1.586	0.135	0.139	0.845	0.407	0.006	0.026	0.979
3	U	0.585	2.336	0.035	0.641	4.265	0.000	0.593	3.113	0.005	0.743	2.810	0.014	0.674	4.457	0.000	0.586	3.035	0.006
4	CA	0.260	1.225	0.241	0.086	0.709	0.486	0.422	2.673	0.014	0.280	1.235	0.237	0.100	0.814	0.424	0.425	2.649	0.015
5	CI	-	-	-	-	-	-	-	-	-	0.359	1.601	0.132	0.188	1.382	0.181	0.029	0.172	0.865
7	R^2	0.50			0.68			0.49			0.43			0.69			0.47		
8	$\overline{R}_2$	0.36			0.63			0.39			0.27			0.63			0.39		
9	S.E.	47.34			26.44			50.69			50.39			26.39			51.47		
10	F-Value	3.47*			11.923*			5.274*			2.655**			11.987*			4.951**		
11	D.W.	1.44			1.96			2.09			1.15			2.00			2.156		

Notes:

1. CR = Composite Index of Rural Industrialisation; CEI = Composite Index of Economic Infrastructure; HDI= Human Development Index; U = Urbanisation; CA = Commercialisation of Agriculture; CI = Composite Index of Infrastructure.
2. For 1991 no. of observations: 19
3. *, ** Shows significance at 1and 5 per cent levels respectively.

Source: Based on the data of selected indicators at three points of time.

Insignificant Urbanisation, with a highly significant coefficient (P=0.035) is found to be the most crucial determinant of rural industrialisation. This is followed by CEI with its coefficient (0.460) showing lower order of significance with P value of 0.047. HDI and CA are found to have played only insignificant role in rural industrialisation of the Eastern region in 1991.

A highly significant coefficient of U again indicates the crucial role of this variable in rural industrialisation of the Eastern U.P. during 2000. This is followed by CEI whose coefficient, however, is having a very low order of significance. The coefficients of HDI and CA, although positive are statistically insignificant, indicating towards still existing lower levels of competencies and agricultural development in the region.

In 2008 also, urbanisation turns out to be the most important determinant of rural industrialisation in the Eastern region. Interestingly, this is followed by a highly significant coefficient of CA (p=0.014). Disappointingly, however, coefficients of CEI and HDI are found to be insignificant. As can be seen from table 1, between 2000 and 2008 average value of HDI has shown only a very small increase from 0.50 to 0.53. . This is a matter of great concern as lack of self-initiative and entrepreneurial skills tend to exacerbate backwardness. Moreover, in this era of globalisation and liberalisation, high human capabilities, including engineering skills are *sine-qua-non* for introducing technological innovations, enhancing productivity levels and increasing competitiveness in the beleaguered manufacturing sector. Further, the average value of CEI has shown a decline over the same period. Low levels of both public and private investment seem to have adversely affected the infrastructure development in the region.

In Model II, a new independent variable CI has been introduced, which is simply a combination of CEI and CSI. In Model I, we have taken CEI only as a representative of infrastructure on a premise that all improvements in social infrastructure will get reflected in the output measure of HDI with its literacy and life expectancy components and this will, thus, capture the contribution of social infrastructure to rural industrialisation indirectly. HDI, as a composite measure, is also inclusive of NDDP per capita, and for explicitly analysing the role of economic and social infrastructure, it was deemed worthwhile to carry out regression analysis based on Model II.

The results of Model II, are almost analogous to that of Model I. Positive coefficients of U, CA, CI are accompanied by negative but insignificant coefficient of HDI in 1991. This is obviously because level of human capability in this region in 1991 was extremely low, and therefore could not significantly affect rural industrialisation in a big way. Urbanisation is found to be highly significant (P = 0.014). However, the coefficients of CA and CI are showing a very low level of significance. Model II also yields positive coefficients of all the determining variables in 2000. However, coefficient of U (P=0.000) only is found to be statistically significant. These results are in line with those obtained on the basis of Model I, for this year. Analogous to Model-I, significant coefficient of urbanisation accompanied by a significant coefficient of CA in Model-II also is observed in 2008. This shows that agriculture diversification and commercialisation has resulted in significant improvements in CR of the region. This is very desirable as agro-based industries dominate the industrial sector of the Eastern region.

However, an insignificant coefficient of HDI even in 2008 reveals that skill development and human capability in the region are still at a nascent stage. Even CI, which is included as an independent variable in Model II, does not seem to have made any significant contribution to rural industrialisation. This can be ascribed to inadequacy of economic and social infrastructure in the Eastern region as compared to other regions of the State.[25] This calls for greater public as well as private efforts in terms of increased investment on infrastructure in the region. But the private investment on it will be forthcoming only if investment climate is improved and the scope of profitability is enhanced. Viewing this, the role of public investment assumes greater significance for speedier process of infrastructural development.

The data fit in respect of both the models I and II seems to be good only in 2000, as witnessed with high value of R^2 (0.70). D.W. test indicates that error terms are serially independent at all the three points of time. From the foregoing analysis, urbanisation seems to be the most important determining variable of rural industrialisation in the Eastern region. The catalytic role of urbanisation and its accompanying infrastructure have already been demonstrated in previous studies. In order to exploit the benefits due to access of both infrastructure and diversified market for labour and other inputs, industrial firms tend to concentrate in cities.[26] The origin of any technical invention leading to social change can also be traced back to city.[27]

Rural transformation via rural industrialisation, therefore, requires that the vital elements of the city be brought to the countryside to start the process of rural urbanisation in a dispersed way. For this, public investment should be directed towards the rural districts so that these could metamorphose into agropolis or city on fields[28] inclusive of growth centres with urban characteristics, adequate infrastructural facilities, large and diversified product and factor markets and a good network of financial institutions. These rural towns (agropolis) given welcome environment are logical business locations for many types of enterprises.[29] This is because they serve as centres for marketing farm produce, for obtaining wage employment, for engaging in non-farm enterprises, and for investing.[30] Rural towns or agropolis, thus help check migration from rural areas to cities.

One disappointing result based on both the Models is that the coefficients of CEI and CI are either less significant or insignificant. Rural towns without proper infrastructural build up, will not be able to act as catalyst for rural industrialisation, resulting in several cost disadvantages and a drain on scarce resources. The reasons for this, however, are not far to seek. U.P. has been ranked very low in the hierarchy of States as far as the levels of infrastructure and investment climate, an essential prerequisite for attracting private investment, are concerned.[31] Eastern region being one of the extremely backward region of the State suffers more from inadequacy of infrastructure and inefficiency in its use, particularly the decreasing as well as irregular supply of power, and, water for irrigation purposes, lowering the productivity levels both in agriculture and industry. This has a cascading effect across the board due to weak sectoral linkages. The levels of social infrastructure are also very low in this region. The sluggishness in government spending on infrastructure and social services in recent years is not being compensated by the private investment due to overall poor credibility of the State and its regions. This problem is further exacerbated by weak institutions, which tend to reduce the efficiency of whatever is being spent.[32]

Inter-correlation matrices based on models I and II for 1991, 2000 and 2008 are presented in Table 3. In 1991, urbanisation and CEI are showing significant correlation with CR, further corroborating our previous results. HDI is showing a positive association with urbanisation as well as infrastructure. A highly urbanized setting with increasing availability, as well as the efficiency in the use of social infrastructure is dire need of the day for a social transformation, which is, deemed to be a prerequisite for higher capability levels. Multicolinearity among independent variables may, *inter-alia*, be an important reason for insignificant coefficients of these variables. In 2000, high coefficient of correlation is observed between CR and the independent variables HDI and U. While the importance of urbanization has also been substantiated by the regression results, a strong correlation between U and HDI might have resulted in insignificant coefficient of HDI. The correlation results in 2008 are similar to that in the year 2000.

TABLE 3: INTER -CORRELATION MATRIX FOR EASTERN U.P. – 1991, 2000 &2008

Sl. No.	Variables	Based on Models I & II																	
		1991						2000						2008					
		CR	CEI	HDI	U	CA	CI	CR	CEI	HDI	U	CA	CI	CR	CEI	HDI	U	CA	CI
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.	CR	1.000						1.000						1.000					
2.	CEI	0.538*	1.000					0.361	1.000					0.184	1.000				
3.	HDI	0.209	0.395	1.000				0.623*	0.329	1.000				0.257	0.290	1.000			
4.	U	0.514*	0.385	0.598*	1.000			0.787*	0.219	0.603*	1.000			0.546*	.139	0.598*	1.000		
5.	CA	0.143	0.068	0.363	0.005	1.000		0.056	-0.145	-0.010	-0.005	1.000		0.351	-0.60	-0.260	-0.119	1.000	
6.	CI	0.309	0.859*	0.417	0.168	0.100	1.000	0.331	0.832*	0.416	0.157	-0.209	1.000	0.123	0.932*	0.412	0.234	-0.108	1.000

Note: * shows significance at 1 percent level.

Source: Based on the data of selected indicators at three points of time.

CATEGORY-WISE RESULTS OF LINEAR FORMULATION - MODELS I & II

As already indicated in a previous section, all the 27 districts of the Eastern region have been divided into two categories – relatively more industrialised (category I) and relatively less industrialised (category II), based on levels of rural industrialization (CR) arranged in descending order and taking its arithmetic mean in 1991 as the dividing line.. In 1991, however, the Eastern region comprised only 19 districts. There were respectively 6, 10 and 18 districts falling in relatively more industrialised category in 1991, 2000 and 2008 (see note of table 1) showing the slow but steady improvement overtime.

Category-wise results of Models I & II at the three selected points of time have been placed in tables 4 and 5. The results based on Model I for Category I, have not yielded any promising results at all the selected points of time. Excepting the coefficient of urbanisation in 2008, all other variables are found to be insignificant at all three points of time. Besides, the coefficient of HDI is found to be negative in 1991 and 2008 and positive in 2000, yet it is found to be statistically insignificant at all these points.

TABLE 4: CATEGORY-WISE LINEAR MULTIPLE REGRESSION FOR EASTERN U.P. - MODEL I

Dependent Variable: CR

No. of Observations: 6, 10, 18 **No. of Observations: 13, 17, 9**

Sl. No.	Independent variables	Category I									Category II								
		1991			2000			2008			1991			2000			2008		
		Coefficient	't' Value	Significance	Coefficient	't' Value	Significance	Coefficient	't' Value	Significance	Coefficient	't' Value	Significance	Coefficient	't' Value	Significance	Coefficient	't' Value	Significance
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.	CEI	1.228	0.687	0.617	0.117	0.406	0.702	0.053	0.217	0.832	-0.159	-0.558	0.592	0.014	0.052	0.959	0.616	3.887	0.018
2.	HDI	-2.350	-0.620	0.647	0.109	0.238	0.822	-0.315	-0.777	0.451	-0.452	-1.211	0.261	0.299	1.063	0.309	0.012	0.064	0.952
3.	U	2.129	0.753	0.589	0.706	1.633	0.163	0.667	2.164	0.050	0.335	0.969	0.361	0.368	1.404	0.186	0.344	1.603	0.184
4.	CA	1.388	0.625	0.645	0.147	0.464	0.662	0.202	0.629	0.540	0.712	2.534	0.035	0.134	0.547	0.594	0.365	1.507	0.206
5.	R^2	0.46			0.66			0.31			0.47			0.34			0.91		
6.	$\overline{R}^2$	-			0.39			0.10			0.21			0.12			0.81		
7.	S.E.	127.30			27.25			58.26			11.22			24.08			7.51		
8.	F-Value	0.22			2.45			1.48			1.80			1.53			9.59*		
9.	D.W.	2.32			1.58			0.70			0.84			0.89			2.53		

Note: 1. CEI, HDI, U, CA – same as in Table 5.3

2. Category I – CR>98.63; Category II – CR<98.63.

3. *, ** shows levels of significance at 1 and 5 per cent levels respectively.

Source: Appendix Table 1.

TABLE 5: CATEGORY-WISE LINEAR MULTIPLE REGRESSION FOR EASTERN U.P. - MODEL II

Dependent Variable: CR

No. of Observations: 6, 10, 18 **No. of Observations: 13, 17, 9**

Sl. No.	Independent variables	Category I									Category II								
		1991			2000			2008			1991			2000			2008		
		Coefficient	't' Value	Significance	Coefficient	't' Value	Significance	Coefficient	't' Value	Significance	Coefficient	't' Value	Significance	Coefficient	't' Value	Significance	Coefficient	't' Value	Significance
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.	CI	0.708	0.274	0.830	-0.211	-0.730	0.498	-0.254	-0.615	0.549	-0.423	-1.371	0.208	0.209	0.760	0.462	0.574	1.804	0.146
2.	HDI	-1.322	-0.253	0.842	-0.076	-0.166	0.875	0.636	2.075	0.058	-0.197	-0.492	0.636	0.187	0.631	0.540	-0.018	-0.591	0.586
3.	U	1.622	0.353	0.784	0.771	1.846	0.124	0.204	0.636	0.536	0.287	0.913	0.388	0.430	1.612	0.133	0.035	0.092	0.931
4.	CA	0.765	0.274	0.830	0.076	0.234	0.498	-.073	-0.291	0.776	0.627	2.352	0.047	0.186	0.768	0.457	0.481	1.244	0.281
5.	R^2	0.26			0.69			0.314			0.56			0.37			0.75		
6.	$\overline{R}^2$	-			0.43			0.103			0.34			0.16			0.51		
7.	S.E.	148.91			26.32			58.18			10.29			23.53			12.18		
9	F-Value	0.09			2.72			1.49			2.51**			1.75			3.02		
10	D.W.	1.28			1.80			0.62			1.09			0.97			1.81		

Note: 1. CEI, HDI, U, CA – same as in Table 5.3

2. Category I – CR>98.63; Category II – CR<98.63.

3. *, ** shows levels of significance at 1 and 5 per cent levels, respectively.

Source: Appendix Table 1.

As far as Category II is concerned, in 1991 CA is found to be the most significant contributor to rural industrialisation (P=0.035). This is in accordance with expectation simply because the less industrialised category is constituted by majority of the districts heavily biased to agriculture. The contribution of all other selected variables to CR is found to be insignificant, portraying the general backwardness of the districts falling in this category. In 2000, Model I has yielded positive coefficients of all the independent variables, but only U is found to be showing a very weak statistical significance. Thus, it seems that impulses of urbanism have started taking place in less industrialised districts. In 2008 also similar results for urbanisation can be observed which have been accompanied by significant improvements in economic infrastructure (CEI) and collectively seem to be positively influencing the rural industrialisation process in the districts falling in category-II.

Excepting HDI, Model II is found to be yielding positive but insignificant coefficients of all the variables in 1991 for the districts falling in category I. Some improvement in the results of this model can be observed at the latter two points of time. In 2000, urbanisation is having a positive and significant coefficient. However, what is more appealing is a highly significant coefficient of HDI (P=0.058) in 2008 for category I. Higher capability levels seem to be positively influencing CR in more industrialised districts at the latest selected point of time.

TABLE 6: CATEGORY-WISE CORRELATION MATRIX FOR EASTERN U.P.

1. Category I

Sl. No.	Variables	Based on Models I & II																	
		1991						2000						2008					
		CR	CEI	HDI	U	CA	CI	CR	CEI	HDI	U	CA	CI	CR	CEI	HDI	U	CA	CI
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.	CR	1.000						1.000						1.000					
2.	CEI	0.261	1.000					0.030	1.000					-0.064	1.000				
3.	HDI	0.362	0.533	1.000				0.525	-0.370	1.000				-0.020	0.253	1.000			
4.	U	0.442	0.078	0.660**	1.000			0.795*	-0.120	0.703*	1.000			0.405**	0.004	0.629*	1.000		
5.	CA	0.037	0.086	0.469	-0.166	1.000		0.275	0.262	-0.256	0.178	1.000		0.195	-0.193	-0.683	-0.317	1.000	
6.	CI	-0.003	0.931*	0.360	-.253	0.229	1.000	-0.431	0.102	-0.369	-0.302	-0.202	1.000	-0.161	0.930*	0.370	0.096	-0.270	1.000

2. Category II

Sl. No.	Variables	Based on Models I & II																	
		1991						2000						2008					
		CR	CEI	HDI	U	CA	CI	CR	CEI	HDI	U	CA	CI	CR	CEI	HDI	U	CA	CI
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.	CR	1.000						1.000						1.000					
2.	CEI	-0.193	1.000					0.100	1.000					0.691*	1.000				
3.	HDI	-0.063	0.397	1.000				0.467**	0.336	1.000				0.319	-0.071	1.000			
4.	U	0.021	0.376	0.637	1.000			0.485**	0.034	0.413**	1.000			0.639*	0.059	0.417	1.000		
5.	CA	0.572	0.026	0.335	0.046	1.000		0.137	-0.202	0.085	-0.054	1.000		0.703*	0.150	0.568**	0.695*	1.000	
6.	CI	-0.425	0.474	0.611	0.401	0.006	1.000	0.223	0.911*	0.413**	-0.061	-0.201	1.000	0.780*	0.598	0.367	0.600**	0.522	1.000

Note: *, ** shows levels of significance at 1 and 5 per cent levels respectively.

Source: Based on data placed at Appendix Table 1.

Model II results for the less industrialised category II show negative but insignificant coefficients of CI and HDI in 1991. Only CA is found to be significantly influencing CR. Excepting U in 2000 and CI in 2008 all other variables are insignificant in the said years. This has added fuel to the fire of industrial backwardness of the districts constituting this category and some effective policy measures are required for their speedy development.

Category-wise inter-correlation matrix based on Models I and II has been presented in Table 6. None of the independent variables are showing a strong correlation with CR, excepting U and CA. U and HDI, however are found to be closely correlated, which might have resulted in insignificant coefficient of these variables in regression results due to multicolinearity. To promote industrialization and reduce severity of industrial backwardness in the Eastern region, especially the very backward districts, namely, Maharajganj, Bahraich, Ghazipur, Kaushambi, Pratapgarh, Azamgarh, Ambedkarnagar, Siddarthnagar & Shrawasti. a strong infrastructural base with special emphasis on skill and capability development is considered to be the most crucial. Besides, intra- regional imbalances which are plaguing this region also need to be addressed for balanced development of the region and the State of Uttar Pradesh as a whole.

CONCLUSION

In sum, rural industrialisation is designated as a prerequisite for rural development. As urbanisation is found to be the most important contributor to rural industrialisation in the preceding analysis, this calls for pursuing a policy, which aims at promoting dispersed urbanisation in terms of the development of rural towns or agropolis, providing an urban environs within a rural setting in terms of infrastructural, marketing and institutional arrangements. For this purpose, a massive public investment will be needed in rural districts in order to transform them into growth centres, stimulating the growth in the surrounding periphery through provision of services and social infrastructure. Rural urbanisation, therefore, seems to be the need of hour for accelerating rural industrialisation not only in the Eastern region, but also majority of the districts constituting the reorganised State of Uttar Pradesh. In spite, there will be fundamental distortions in the path of development, if the region is lacking in human capability. Even if government ensures adequate availability of infrastructure and financial resources, lack of human capability and entrepreneurship, the active factor of growth, will, no doubt, retard the progress of rural industrialisation in the industrially backward districts. Due to its inadequacy, these districts will not be in a position to assimilate and adapt the modern technology, and, application of new innovations will then become the remotest possibility. For this, enabling factors, such as, high quality technical education and better health care services will have to be put in place. Also, the workforce equipped with high capabilities and competencies will be largely able to participate in the fruits of accelerated growth.

For a predominantly agrarian Eastern region, the importance of commercialisation of agriculture cannot be undermined. As agro-based industries form the majority of SSIs in this region, more so in the less industrialised category districts, sustained efforts should be made for enhancing the area and yield under commercial crops. In Eastern region, a silver lining is discernible in terms of significant role which CA is playing in rural industrialisation of the region. This will pave the way for ensuring regular supply of raw materials to agro-based industries and thereby enhancing the sustainability of rural industrialisation in the Eastern Uttar Pradesh.

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10. **Variables Used in Constructing Human Development Indices**

Dimensions	UP HDR II	NHDR	UNDP HDR (2006)
a) Income	Adjusted Per Capita Inco at constant prices in PPP in $	Inflation and inequality adjusted per capita consumption expenditure	Per Capita Income at constant prices in PPP in $
b) Education	Literacy (7+)	1. Literacy (7+) 2. Intensity of formal education	1. Literacy age 15 and above 2. Gross Enrolment Ratio – school education
c) Health	Infant Mortality Rate	1.Life expectancy at age1 2.Infant Mortality Rate	Life expectancy at age 0

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APPENDIX

TABLE 1: DISTRICT-WISE VALUES OF THE VARIABLES IN EASTERN UTTAR PRADESH, 1991, 2000, 2008

DISTRICTS	CR-1	CEI-1	CSI-1	CI-1	HDI-1	U-1	CA-1	CR-2	CEI-2	CSI-2	CI-2	HDI-2	U-2	CA-2	CR-3	CEI-3	CSI-3	CI-3	HDI-3	U-3	CA-3
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Pratapgarh	44.63	83.81	120.58	102.19	0.37	5.5	7.03	63.24	89.07	133.93	111.5	0.50	5.28	6.85	75.50	81.64	95.25	88.44	0.53	5.26	5.49
Allahabad	105.08	119.47	89.39	104.43	0.41	20.8	7.92	160.58	106.69	121.81	114.25	0.55	24.56	6.98	280.13	101.57	115.76	108.67	0.57	24.97	5.49
Bahraich	66.76	89.38	87.31	88.34	0.27	7.8	7.18	88.69	85.91	86.1	86	0.41	9.98	9.13	95.55	83.73	100.15	91.94	0.44	10.23	8.38
Gonda	167.01	64.31	86.28	75.29	0.33	7.4	9.52	85.15	72.87	88.3	80.59	0.45	7.09	8.62	113.03	71.59	88.36	79.97	0.48	7.06	18.65
Faizabad	89.92	96.67	91.11	93.89	0.43	11.7	12.26	92.97	97.22	89.66	93.44	0.53	13.47	12.16	118.85	128.77	117.99	123.38	0.55	13.66	18.85
Ambedkar Nagar	-	-	-	-	-	-	-	27.55	90.4	69.61	80.01	0.53	8.89	12.16	70.74	54.32	104.79	79.55	0.56	8.65	11.18
Sultanpur	167.47	176.42	140.42	158.42	0.42	4.5	11.5	94.74	143.69	144.27	143.98	0.51	4.76	12.42	168.13	284.36	114.05	199.20	0.54	4.79	12.23
Siddharth Nagar	80.1	63.41	92.29	77.85	0.33	3.5	5.7	43.2	82.97	86.94	84.96	0.45	3.82	5.96	51.95	64.04	86.43	75.24	0.47	3.85	3.9
Maharajganj	72.17	65.43	115.72	90.57	0.37	4.9	11.48	111.45	113.51	108.33	110.92	0.47	5.08	10.18	97.81	94.19	72.58	83.39	0.49	5.10	9.57
Basti	80.1	68.72	97.99	83.36	0.32	6.4	9.6	99.75	132.38	105.07	118.73	0.46	5.56	14.11	101.10	97.77	112.14	104.96	0.49	5.48	17.27
Gorakhpur	72.17	92.69	118.63	105.66	0.48	18.8	8.59	105.79	107.17	141.07	124.12	0.55	19.58	7.57	124.82	92.47	120.60	106.54	0.58	19.66	6.77
Kushinagar	–	–	–	–	–	–	–	72.93	80.36	91.02	85.69	0.48	4.6	29.44	242.27	63.56	71.98	67.77	0.50	4.39	27.57
Deoria	92.21	74.44	99.11	86.77	0.42	7.3	19.85	96.33	90.24	89.61	89.92	0.52	9.9	10.74	106.06	91.60	124.85	108.22	0.54	10.21	7.31
Mau	64.54	87.02	90.67	88.84	0.51	16.9	10.26	151.82	122.75	93.59	108.17	0.57	19.36	8.57	158.07	119.78	110.51	115.14	0.59	19.62	6.68
Azamgarh	64.54	99.26	90.84	95.05	0.41	7.2	10.04	73.75	100.67	96.06	98.37	0.51	7.63	9.04	74.88	81.25	80.91	81.08	0.54	7.67	7.49
Jaunpur	61.87	95.86	84.73	90.29	0.43	6.9	9.72	94.42	85.54	93.07	89.3	0.53	7.39	9.22	117.30	80.66	78.76	79.71	0.55	7.44	7.01
Ballia	64.5	77.33	142.16	109.75	0.51	9.9	10.75	106.43	88.93	132.08	110.51	0.57	9.81	9.49	112.52	74.19	128.46	101.32	0.58	9.80	7.31
Sant Ravidas Nagar	–	–	–	–	–	–	–	123.88	122.47	84.6	103.54	0.55	12.8	8.59	159.65	117.80	67.30	92.55	0.57	11.87	6.43
Varanasi	302.34	142.19	76.02	109.11	0.51	27.2	11.08	192.13	114.86	92.54	103.7	0.58	40.31	14.67	218.54	128.12	101.31	114.72	0.61	41.93	10.78
Ghazipur	74.91	108.33	94.59	101.46	0.47	7.4	12.11	88.43	111.03	112.78	111.9	0.55	7.64	12.23	89.51	75.27	99.47	87.37	0.57	7.66	9.27
Mirzapur	101.82	128.84	110.99	119.92	0.44	13.8	9.75	114.16	140.99	92.77	116.88	0.53	13.57	8.89	117.86	95.26	96.55	95.90	0.55	13.55	8.39
Sonbhadra	101.82	100.88	111.85	106.36	0.47	13.4	14.61	187.59	123.84	105.09	114.47	0.54	18.87	11.65	283.95	81.36	84.71	83.04	0.56	19.53	10.43
Kaushambi	–	–	–	–	–	–	–	37.19	120.66	125.95	123.3	0.48	7.1	9.23	81.85	86.40	103.10	94.75	0.52	6.38	9.61
Shrawasti	–	–	–	–	–	–	–	21.23	94.92	83.95	89.43	0.40	2.81	5.34	49.43	68.93	70.43	69.68	0.41	2.54	4.39
Balrampur	–	–	–	–	–	–	–	55.71	74.36	75.5	74.93	0.42	8.07	14.24	211.43	63.02	59.36	61.19	0.45	8.14	24.77
Sant Kabir Nagar	–	–	–	–	–	–	–	52.77	136.23	92.08	114.15	0.45	7.15	8.98	185.00	96.11	75.06	85.59	0.48	7.23	7.26
Chandauli	–	–	–	–	–	–	–	95.02	130.41	128.86	129.64	0.56	10.61	5.59	100.24	137.83	78.05	107.94	0.59	9.66	3.72
SD	58.93	29.11	18.58	18.47	0.07	6.39	3.09	43.29	21.03	20.6	17.23	0.05	7.99	4.58	65.27	43.27	19.43	25.97	0.05	8.31	6.09
AV	98.63	96.55	102.14	99.34	0.42	10.59	10.47	93.96	105.93	102.39	104.16	0.50	10.95	10.45	133.56	96.87	94.77	95.82	0.53	10.98	10.23
CV	0.60	0.30	0.18	0.19	0.17	0.60	0.30	0.46	0.2	0.2	0.17	0.10	0.73	0.44	0.49	0.45	0.21	0.27	0.10	0.76	0.60
Eastern Region	100	100	100	100	0.42	11.6	10.5	100	100	100	100	0.50	11.78	10.44	100.00	100	100.00	100	0.53	11.8	10.27

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