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Rural Non-Agricultural Working Force and Levels of Development in Uttar Pradesh: A Regional Analysis (India)

Shafiqullah[1*] --- Sana Asma[2]

[1]Department of Geography Faculty of Science, Aligarh Muslim University Aligarh, India
[2] Research Scholar (UGC-SRF), Department of Geography Faculty of Science, Aligarh Muslim University Aligarh, India

Abstract

The present paper investigate the trends of rural non-agricultural working force over the period of 1971 to 2011, the regional variations in the rural non-agricultural working force and the relationship between rural non-agricultural working force and levels of development among the districts of Uttar Pradesh. The regional variations in the distribution of workforce in rural non-agricultural sectors are quite notable. The general picture emerged that there is a gradual increase of main workforce in non-agricultural sector from north-western to south-eastern parts of Uttar Pradesh. The distribution of female main workforce in non-agricultural workforce depicts that there is a gradual decrease from west to south-east. The statistical analysis leads to conclusion that agriculture, population growth and health facilities are the chief determinants but the magnitudes of their effects are dissimilar.

Keywords: Working force, Agriculture, Population growth, Health facilities, Magnitude, Development.

Contents

* *Corresponding Author*

1. Introduction

Since the early 1970s attention has been paid to the significance of the non-agricultural sector in the rural Indian economy. The census on occupational classification of workers [1] provided a far more detailed picture of the composition of the nonagricultural workers in rural areas. Workers were classified into about one hundred occupational groups, along with their further subdivisions. The data allowed grouping of the rural workers in four classes: (a) workers engaged in producing goods and providing services to local population, (b) government instituted workers giving educational, medical, transportation and such like services to the people, (c) workers engaged in non-agricultural production and services oriented to non-local markets, and (d) adventurous workers, such as technical personnel, administrative staff and proprietors working on various development projects in rural areas.

The economy of rural areas in India is predominantly based on agriculture and other activities related to agriculture sector. Hence an overwhelming majority of rural population mainly depends on agriculture sector both for its employment and livelihood. At the same time various non-agricultural activities are also playing an important role in providing the opportunities of employment and incomes to the labourforce belonging to both farming and non-farming households. Though, the nature of employment as available either in agricultural or non-agricultural activities is measured for a shorter duration. As per 2011 Census, nearly one-fourth of the rural work force (main workers) was reported to be employed in non-agricultural pursuits.

The non-agricultural activities include all economic activities other than crop production and allied agricultural activities such as animal husbandry, plantations, fishing, forestry, etc. Rural non-agricultural economic activities consist of wide ranging various traditional and modern manufacturing industries, mining and quarrying, construction, trading, transport, storage and communication, hostelling and those rendering community and personal services. The non-agricultural work may often be undertaken as a secondary activity. This view of the rural populations exclusive dependence on agriculture has began to change in the past few years. The reflection in the shift of workforce from agriculture sector to non-agriculture sector has been well visualized in almost all the states in India.

Occupational diversification away from agriculture in favour of non-agriculture activities in the rural economy has generated a lot of interest among researchers. The issue is whether the declining share of agriculture in employment reflects maturing of positive growth forces in the economy or a result of adverse trends in the agrarian sector resulting in the growing inability of agriculture to further absorb the expanding labourforce. Many studies make important contributions in the scrutiny of the nature of employment in the rural non-agricultural sector especially at the all-India level [2-6].

However, there are no such significant studies carried out for Uttar Pradesh (U.P.) in particular, which is the most populous state in the country. One sixth of the World's population lives in India and one-sixth of India's population lives in Uttar Pradesh. Its share in total area of the Country is 7.3 per cent. The predominance of rural population makes the state economy primarily agrarian. The State's two thirds of the total workers are still engaged in agriculture and allied activities. The economic development and income of the people in the state depend largely on its agricultural base. However, the state has lately witnessed rapid industrialization after liberalization and globalization of the national economy.

After consolidation of hilly districts and some plain areas into a separate state of Uttarakhand, Uttar Pradesh now largely consists of fertile plain of Ganga basin in part. At present it extends between 23^0 52' and 30° 24' N latitudes and 77^0 05' and 84° 38' E longitudes. The state shares international border with Nepal and Tibet in northeast, with the Indian states of Himachal Pradesh in northwest, Haryana, Rajasthan and Delhi in west and Madhya Pradesh and Chattisgarh in south, and Bihar and Jharkhand in southwest (Figure 1).

Fig-1. Based on Census of India, 2011

Geographically, the location of Uttar Pradesh and its climate are conducive to earn livelihood from agriculture and diversification of its economy. The state is well known for success in the green revolution and for the highest production of food-grains and sugarcane in the country. However, the poverty is widespread in the state as it has the highest number of people below poverty line (about 32 per cent) as compared to the other states. It lags behind not

only in economic progress but in terms of indicators of human development as well. The state has wide variations in the level of development, we can expect that factors driving non-agricultural workforce growth would also vary. It is likely that in the most developed western region, diversification of workforce away from agriculture would reflect the role of demand –pull factors generated by agricultural dynamism, while in the western, eastern and southern regions distress-push can play a role in increasing the volume of non-agricultural workforce. A study of rural non-agricultural workforce is crucial to an understanding of the regional pattern of diversification of rural economy. The magnitude and direction of shift from agriculture to non –agriculture is worth investigation and equally essential is to probe into the role of diverse factors in the process.

In the light of the above facts, an attempt has been made to study the 'Rural non-agricultural working force and levels of development in Uttar Pradesh' under three main sections. In the section I, we analyze the trends of rural non-agricultural working force over the period of 1971 to 2011. Section II explains the regional variations in the rural non-agricultural working force and the section III finds out the relationship between rural non-agricultural working force and levels of development among the districts of Uttar Pradesh.

2. Data and Method

The study is mainly based on the secondary sources of data obtained from the Office of the Registrar General of India and Census Commissioner, Government of India, New Delhi and the State Planning Institute, Uttar Pradesh, Lucknow. The district has been taken as a unit of analysis due to: firstly, a fairly satisfactory data base is available at this level, secondly, it offers better facilities for formulation and implementation of plans as it has a definite administrative set up and fairly well defined geographical boundaries and finally, there is better possibility of co-ordination of micro-level planning at district level.

For the identification of the levels of development and its correlates 39 variables have been selected (Table 1). For this purpose the district wise value of each indicator is standardized with the help of 'z' score technique which is also known as 'zi' value or 'z' score.

$$Zij = \frac{Xij - \overline{Xi}}{\delta Xj}$$

Where:

Zij= standardized value of the variable i in district j

Xij = actual value of variable i in district j

$\overline{Xi}$ = mean value of the variable i in all districts

δ Xj = Standard Deviation (δ) of variables in all districts

After working out the 'z' score of all the indicators, composite score (C.S.) for each district has been calculated with the following algebraic expression:

$$CS = \frac{\Sigma Zij}{N}$$

Where, C.S. is composite score, N refers to the number of variables, ΣZij indicate 'Z' scores of all variables i in district j. The positive values relating to district's score show high level of development and negative values the low level of development.

The correlation co-efficient between livestock and levels of development has been computed on the basis of the Karl Pearson's correlation co-efficient (r) method.

2.1. Trends of Rural Non-Agricultural Working Force

Uttar Pradesh is predominantly an agricultural state. Hence, a very low percentage of rural workforce is engaged in the non-agricultural sector. The share of rural workforce in non-agricultural sector has increased considerably over the decades at national level as well as state of Uttar Pradesh. Table 2 reveals that the percentage of non-agricultural workforce improved from 12.30 per cent in 1971 to 24.33 per cent in 2001 and rose further to 27.85 per cent in 2011 in the state. At the national level, around one-seventh of the rural workforce was engaged in non-agricultural sector in 1971 which is increased by 25 per cent points in 2011 (39.32 per cent). During 1981-2011, the percentage of rural non-agricultural workforce has been gradually increased by nearly 20 per cent points both in the state and country.

Table-2. Trends of Rural Non-Agricultural Workforce (Main), Uttar Pradesh and India, 1971-2011

Census Year	Uttar Pradesh			India		
	Rural	Male	Female	Rural	Male	Female
1971	12.30	12.90	7.40	15.20	16.30	10.6
1981	13.68	14.11	9.55	19.02	20.84	12.73
1991	15.52	16.54	8.62	19.97	22.45	12.59
2001	24.33	24.63	22.63	29.37	31.66	22.95
2011	27.85	26.27	35.52	39.32	38.18	40.84

Source: Census of India, 1981, 1991, 2001 and 2011.

When the share is computed for male and female workforce separately, it is found that the share in rural non-agricultural workforce has increased and the difference between sexes remained more or less similar. The percentage of male workforce in non-agricultural sector has increased during the period 1971-2011 from 16.3 to 38.18 per cent and from to 12.90 to 26.27 per cent respectively in India and Uttar Pradesh. The female workforce in Uttar Pradesh increased continuously from 7.40 per cent in 1971 to 35.52 per cent in 2011. India has also made a remarkable increase in female workforce during the same period.

In the case of both male and female rural non-agricultural workforce the percentage was almost static during 1981-2011, but there has been a significant increase during the period 2001-2011 both in the country and state. However, the inequality in the percentage of male and female rural non-agricultural workforce remained more or less same during the reference period (Table-2).

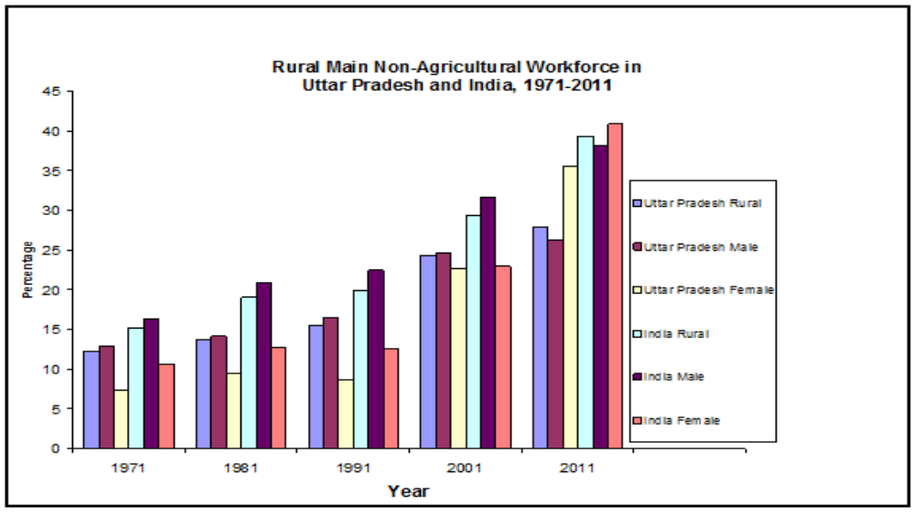

Fig-2. Based on Census of India, 1981, 1991 , 2001 and 2011.

2.2. Rural Non-Agricultural Workforce (Main)

The regional distribution of main non-agricultural workforce during the decade 2001-2011 is observed to be wide with maximum percentage of 57.51 in SantRavidas Nagar and a minimum of 12.80 in Badaun district giving an average of 27.85 per cent for the state. The distribution of the percentage of main non-agricultural workforce in rural population among the districts may conveniently be arranged into five grades of below 16, 16-24, 24-32, 32-40, and 40 and over (Table 3).

Table-3. Category wise Distribution of Rural Non-Agricultural Work Force, Uttar Pradesh, 2011

Category	% age	No. of Districts	% to total Districts
Very High	40 and Over	12	16.90
High	32-40	13	18.31
Medium	24-32	15	21.13
Low	16-24	22	30.98
Very Low	Below 16	99	12.68
		71	100.00

Source: Census of India, 1981, 1991 and 2001.

Considering the above mentioned five grades separately, we find that the districts under the first grade of 40 and over form three small but identifiable regions (Fig. 3). Two of them are found in the eastern region and one in the western plain region. About 18 per cent districts of the state lies under the high percentage grade and are found in two pockets. One region, relatively big in size occurs in the in the south-western part includes Bulandshahr, Hathras, Aligarh, Agra, Firozabad and Mathura districts, second lies in the north-western part comprising the districts of Saharanpur, Bijnor and Muzaffarnagar. The districts with percentage very close to the state average (27.85 per cent) occupying about 21 cent districts are scatteredly distributed over the state and fail to form a notable region in the state. About 31 per cent districts falling under the low percentage grade constitute a longitudinal zone which extends from Siddhrathnagar in the east to Jhansi in the south and Etah in the west. Only nine districts fall under the very low percentage grade constitute a continuous prominent region in the north-eastern and western parts which runs from Balrampur in the east to Budaun in the west. The other two districts of the same grade are detached from the main region.

The general picture emerged from this discussion is that there is a gradual increase of main workforce in non-agricultural sector from north-western to south-eastern parts of Uttar Pradesh.

2.3. Male Non-Agricultural Workforce

The regional distribution of male main workforce in non-agricultural sector of rural population is very similar to that of the main non-agricultural workforce.

Among the districts its proportion varies from 10.16 per cent in Budaun to 59.34 per cent in SantRavidas Nagar districts with a state average of 26.27 per cent.

Table-4. Categorywise Distribution of Male Non-Agricultural Workforce, Uttar Pradesh, 2011

Category	% age	No. of Districts	% to total Districts
Very High	40 and Over	10	14.08
High	32-40	11	15.49
Medium	24-32	18	25.35
Low	16-24	16	22.54
Very Low	Below 16	16	22.54
		71	100.00

Source: Census of India, 1981, 1991 and 2001.

The graded distribution of male main workforce in non-agricultural sectors of rural population as depicted in Fig. 4 shows that about one-fourth districts of the state fall under very low percentage grade (below 16 per cent) form a prominent region in the north-eastern and western part of the state. The other districts of similar grade are scattered too sporadically to form a distinct region. On the other hand, there are four small but definable regions of high percentage grade found in the eastern and western parts of the state. Eighteen districts of the state fall under the grade of very close to the state average, eleven of them form a notable region in the eastern part of the study area. The other districts of the same grade are scattered and do not form any notable region. About 23 per cent districts fall under the low grade and form a number of small pockets of which a prominent region occurs in the south-western part. There are three regions of high percentage grade (32-40 per cent) which combinedly cover more than one-fifth of the districts of the state form a number of identifiable regions. Among them one relatively big size occur in the southern part of the state. The general pattern is marked by gradual increase from west to south and to east in Uttar Pradesh.

2.4. Female Non-Agricultural Work Force

The pattern of regional distribution of female main non-agricultural workforce is quite different from that of general and male rural workforce. It varies from 12.82 per cent to 61.36 per cent giving an average of 35.52 per cent for the state.

Table-5. Categorywise Distribution of Female Main Non-Agricultural Workforce, Uttar Pradesh, 2011

Category	% age	No. of Districts	% to total Districts
Very High	50 and Over	14	19.72
High	42-50	14	19.72
Medium	34-42	14	19.72
Low	26-34	13	18.30
Very Low	Below 26	16	22.54
		71	100.00

Fig. 5 shows that the districts falling under the very high percentage grade of 50 and over constitute a longitudinal belt which extends from Muzaffarnagar in the north to Agra in the south. The other districts of same grade are too scattered to constitute a single continuous region in the state. On the contrary, the maximum number of districts (16) fall under the very low grade (below 26 per cent) and mainly concentrated in the eastern and southern parts which are separated by the region of high slab. About 20 per cent districts fall under the grade 42-50 per cent. These districts are grouped into a number of small regions of which the most prominent one occurs in the extreme eastern part comprising Ballia, Mau and Deoria districts. The medium grade districts (34-42 per cent) constitute two discontinuous regions: one region, relatively large in size lies in the north-western part and the other in the eastern part. The low percentage grade is observed in the eastern part with a compact region comprised of eight districts. The other districts of this grade fail to form a notable region in the study area.

The overall distribution depicts that there is a gradual decrease of female main workforce in non-agricultural sectors from west to south-east.

2.5. The Simple Correlation between Rural Non-Agricultural Workforce and Independent Variables

In the present investigation, relationships have been sought between rural non-agricultural workforce and thirty nine variables of the districts of Uttar Pradesh. Selection of each variable is based on an ability to develop a rational hypothesis of relationship between the variables and non-agricultural workforce.

Table 1 reveals that sixteen variables out of thirty nine are significant at confidence level of 99 per cent, though the actual magnitudes of their coefficients are different. X_1 (literacy Rate, r=0.521), X_2 (Rural Literacy Rate, r=0.511), X_4 (Male Literacy Rate, r=0.591), X_5 (Female Literacy Rate, r=0.440), X_7 (Educational Institute/ Student Ratio, r=0.568), X_{10} (Percentage of Urban Population, r=0.391), X_{12} (Population Density, r=0.731), X_{19} (No. of Persons Engaged in Registered Factories / Lakh Population, r=0.399), X_{20} (Employees in Public Sectors (Govt) / Lakh Population, r=0.306), X_{27} (Percentage of Net Irrigated Area to Net Sown Area, r=0.387) and X_{36} (Percentage of Villages with Linked Road, r=0.335) are found to have direct relationship with rural non-agricultural workforce (Y_1). The variables X_{11} (Percentage of Rural Population, r= -0.382), X_{22} (Land Utilization, r= -0.401), X_{23} (Total Cropped Area, r= - 0.367), X_{28} (Person / Cultivated Area, r= -0.5.67) and X_{38} (No. of Post Office/ lakh Population, r= -0.351) turn out to have a significant inverse relationship with Y_1. The variables which are significant and well above the stipulatedly acceptable 95 per cent level of confidence are: X_8, X_{20}, X_{31}, X_{33} and X_{34}. Only two variables have inverse relationship with Y_1. Table also shows that male rural non-agricultural workforce (Y_2) has similar reciprocal relationship between the same variables as has been found for Y_1.

Only ten variables are highly significant at 99 per cent level of confidence in their relationship with female non-agricultural workforce (Y_3). Among them six variables namely: X_1, X_2, X_5, X_{10}, X_{12} and X_{27} are positively associated with Y_3. Remaining four variables X_{11} (Percentage of Rural Population, r= -0.373), X_{28} (Person / Cultivated Area, r= -0.417), X_{34} (No. of Doctors per Lakh Population, r= -0.390) and X_{38} (No. of Post Office/ lakh Population, r= -0.372) are negatively associated with Y_3. Six variables are namely: X_4, X_{13}, X_{16}, X_{19}, X_{26}, and X_{36} are significant at 95 per cent level of confidence except X_{13} and X_{16}. Remaining four variables are positively associated with Y_3.

This explanation leads to conclusion that agriculture, population growth and health facilities are the chief determinants but the magnitudes of their effects are dissimilar.

Table-1. Co-efficient of Correlation for Non-Agricultural Workforce (Total, Male and Female), and its Correlates Uttar Pradesh, 2001

Variables	Correlates	Correlation of Coefficient Non-Agricultural Workforce		
		Y_1	Y_2	Y_3
X_1	Literacy Rate	0.521*	0.501*	0.356*
X_2	Rural Literacy Rate	0.511*	0.490*	0.366*
X_3	Urban Literacy Rate	0.167	0.197	-0.201
X_4	Male Literacy Rate	0.591*	0.587*	0.277**
X_5	Female Literacy Rate	0.440*	0.407*	0.397*
X_6	Teacher/Pupil Ratio	0.171	0.193	0.005
X_7	Educational Institute/ Student Ratio	0.568*	0.586*	0.202
X_8	Teacher/Student Ratio	0.289**	0.308*	0.085
X_9	Population Growth (1991-2001)	0.210	0.207	0.124
X_{10}	Percentage of Urban Population	0.391*	0.354*	0.380*
X_{11}	Percentage of Rural Population	-0.382*	-0.347*	-0.373*
X_{12}	Population Density	0.713*	0.702*	0.355*
X_{13}	Sex Ratio	0.185	0.234	-0.273**
X_{14}	Percentage of Hindu Population to total Pop.	0.058	0.082	-0.100
X_{15}	Percentage of Muslim Population to total Pop.	-0.022	-0.056	0.173
X_{16}	Scheduled Caste Pop to Total Population	-0.131	-0.106	-0.236**
X_{17}	Population below Poverty Line	0.065	0.078	-0.077
X_{18}	Per Capita Income (at Current Price)	0.216	0.187	0.227
X_{19}	No. of Persons Engaged in Registered Factories / Lakh Population	0.399*	0.369*	0.287**
X_{20}	Employees in Public Sectors (Govt) / Lakh Pop.	0.306**	0.307*	0.116
X_{21}	No. of Livestock Population / Lakh Population	-0.114	-0.108	-0.099
X_{22}	Land Utilization	-0.401*	-0.391*	-0.217
X_{23}	Total Cropped Area	-0.367*	-0.379*	-0.046
X_{24}	%tage of Net Sown Area to total Reporting Area	-0.062	-0.033	-0.190
X_{25}	Area Sown more than once	-0.218	-0.238**	0.104
X_{26}	Cropping Intensity	0.106	0.077	0.291**
X_{27}	Percentage of Net Irrigated Area to Net Sown Area	0.387*	0.333*	0.602*
X_{28}	Person / Cultivated Area	-0.567*	-0.543*	-0.417*
X_{29}	Average Size of Land Holding	-0.186	-0.193	-0.071
X_{30}	No. of Tractors / 1000 ha. of Cultivated Land	0.068	0.044	0.132
X_{31}	Food Production (mt)	-0.286**	-0.295**	0.022
X_{32}	No. of Medical(Allopathic) Institution/ lakh Pop.	0.151	0.152	0.090
X_{33}	No. of Beds in Hospitals/ Dispensaries (Allopathic)/ Lakh Population	0.296**	0.292**	0.152
X_{34}	No. of Doctors per Lakh Population	-0.266**	-0.227	-0.390*
X_{35}	No. of Family Welfare Clinic / Centres/ Lakh Pop	-0.078	-0.054	-0.146
X_{36}	Percentage of Villages with Linked Road	0.335*	0.309*	0.253**
X_{37}	Percentage of Electrified Villages to Inhabitant Villages	0.127	0.143	0.002
X_{38}	No. of Post Office/ lakh Population	-0.351*	-0.329*	-0.372*
X_{39}	No. of Telegraph Offices / Telephone Exchange /Lakh Population	0.038	0.047	-0.013

* Significant at 1% level of confidence. ** Significant at 5 % level of confidence.

3. Conclusion

The percentage of non-agricultural workforce improved from 12.3 per cent in 1971 to 13.78 per cent in 1981 and rose further to 27.85 per cent in 2011 in the state. In the case of both male and female rural non-agricultural work force, the percentage was almost static during 1981-2011, but there has been a significant increase during the period 2001-2011 both in the country and state. The regional variations in the distribution of workforce in rural non-agricultural sectors are quite notable. The general picture emerged that there is a gradual increase of main workforce in non-agricultural sector from north-western to south-eastern parts of Uttar Pradesh. The distribution of female main workforce in non-agricultural workforce depicts that there is a gradual decrease from west to south-east. The statistical analysis leads to conclusion that agriculture, population growth and health facilities are the chief determinants but the magnitudes of their effects are dissimilar.

In the light of the above discussion the effort should be made for development of less developed areas, so that they may come up at par with developed areas, and the concept of planning with social justice proves successfully.

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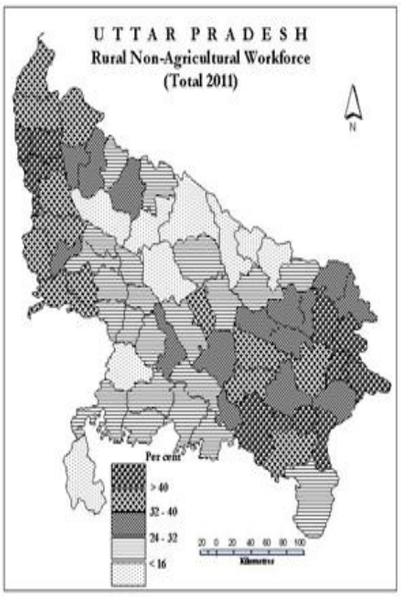
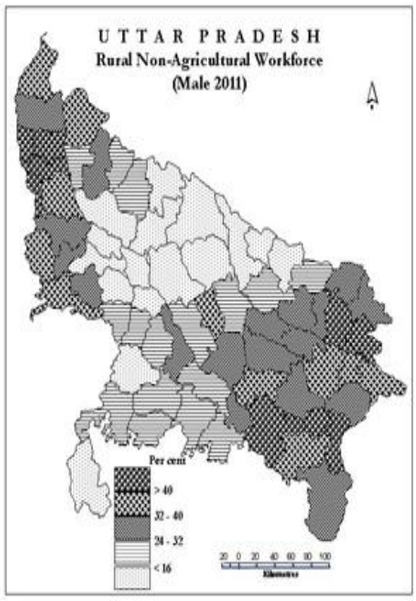


Fig-3. Based on Census of India, 2011



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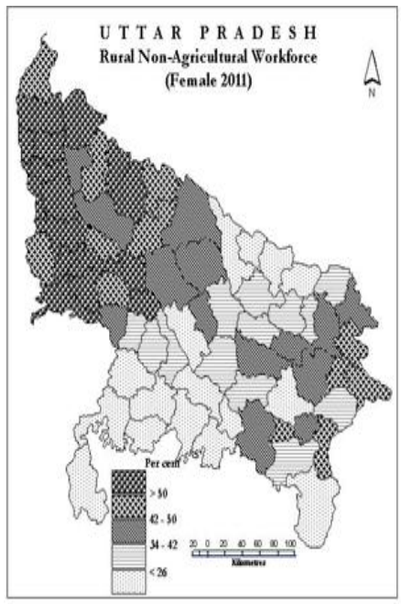

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