SPATIAL VARIATION IN LEVEL OF AGRICULTURAL DEVELOPMENT IN ALIGARH DISTRICT OF WESTERN UTTAR PRADESH (INDIA)

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Abstract

In the present paper an attempt has been made to find out the spatial variation in the adaptation of improved agricultural practices to ascertain the level of agricultural development in Aligarh district of western Uttar Pradesh. The study is based on the block-wise published data obtained from Statistical Bulletin of Aligarh district. The spatial variation of agricultural development is determined with the help of thirteen variables viz; cropping intensity, irrigation intensity, percentage of net irrigated area to net sown area, percentage area under food-crops to gross sown area, percentage of fertilizers consumption per hectare of gross area, percentage of agricultural workers to the main workers, percentage of literate persons , percentage of electrified villages, length of roads per lakh of population and number of junior primary school, senior primary school and higher secondary school . Beside this, the development of blocks are taken with their respective categories viz. high, medium and low on the basis of scores (like mean SD) of these variables. These analyses have been carried out by transforming and combining the data related to thirteen variables, using 'Z' score to get the composite score. On the basis of Composite Score, developments of blocks have been again categorized into three categories i.e. high, medium and low. Results of the aforesaid analysis shows that the modern technological inputs have reciprocal relationship with agricultural development in the study area.

Keywords: Cropping intensity, Irrigation intensity, Agricultural workers, Development blocks and Agricultural development.

1. Introduction

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Agriculture is the main source of livelihood for millions of people in India. Agricultural development is central to all strategies of planned socio-economic development in India. Spectacular break- through in agricultural research, technology development and dissemination under the umbrella of Green Revolution has been major factors in increasing both agricultural production and productivity. The socio-economic factors, the regional institutional setup and the natural factors varying over geographical area together provide a climate for a particular nature of agricultural development framework. Agricultural development enhances social and cultural development due to an increase in per capita income. There is an overall improvement in the quality of life which gets expression in the level of education, health care, better housing and so on. Cultivators are able to make use of technology and go for the improved method of farming. The first important work on problems and prospects of agricultural development in India is the report of the Royal Commission on Agriculture (1928) which provides an authentic report on many problems that were responsible for agriculture backwardness in India, suggestions for improvement of agricultural situation have also been given. Baneerjee (1969) suggested that the future of Indian agriculture depends on the adoption of adequate strategy in agricultural planning based on comprehensive assessment in agricultural resources potentiality in social and economic infrastructure and their possible impact on the country as a whole. Kanwar (1970) has focused attention on the modernization of Indian agriculture. According to him productivity of agriculture is based on the HYV seeds, chemical fertilizers, scientific water management and other practices. These are suitable components of the progress and modernization of Indian agriculture. Pal (1975), in his study has found out that agriculture being the prominent sector of economy, the pace of economic development of the country, has been still continues to be significantly influenced by the pace of its agricultural development. In fact, several eminent scholars have explained the spatio-temporal variations in agricultural development. (Mitra, 1967; Meltor,1967; Nath,1969; Sharma, 1971; Alam,1974; Shenoi, 1975; Mohammad, 1979; Srivastava, 1983; Mohammad, 1992). Swaminathan (2009) expressed that agriculture is not just a food providing machine but the backbone of the livelihood of sixty per cent of people of India. According to Datt & Sundharam (2009), agricultural growth has a direct impact on poverty 3eradication, health, nutrition of rural masses, national security and multiplier effect on entire economy. Peter Timmer (1988) argued that the growth in agricultural productivity is central to

development. Agriculture is the largest sector of the nation which provides about one-fourth GDP, gives livelihood to more than sixty per cent of population and employs nearly 69 per cent of the total workforce (Ranganathan, 2003). Thus, the development of agriculture sector can serve up as a catalyst for rapid growth of whole economy (Maity and Chatterjee, 2006). They all have tried to understand the pattern and processes of the crucial problem of agricultural development as it is a multidimensional concept. There are concerns regarding the agriculture sector in India as the compound growth rate of total food grains were less than two percent in the last decade i.e. area: 0.29, production: 1.96, yield: 2.94 (Ministry of Finance, 2011); making traditional farming a non viable agricultural activity. Disparities in productivity across regions/districts and even within crops persist with significant increase in small and marginal farm holdings. Agricultural development denotes the quality of agricultural system of a region; it is a multi dimensional concept which mainly includes development in a real strength of cropped land, improvement in farm practices/system, improved farm implements, irrigation system and irrigated area, high yielding improved varieties of seeds, chemical fertilizers, insecticides and pesticides, intensity of cropping and specialization and commercialization of agriculture (Mohammed, 1980).The changing agro-economic scenario drew attention of research workers on diffusion of technological development in agriculture. In India majority of its population depend upon agriculture. So a vast rural mass tries to earn their livelihood from agricultural land. With fast increasing pressure of population on agricultural land, old methods and techniques of production cannot cope with growing demand. As a result, new technologies and commercial crops are adopted to develop agro-economy. For these reason emphases on the diffusion of agricultural innovation are stressed.

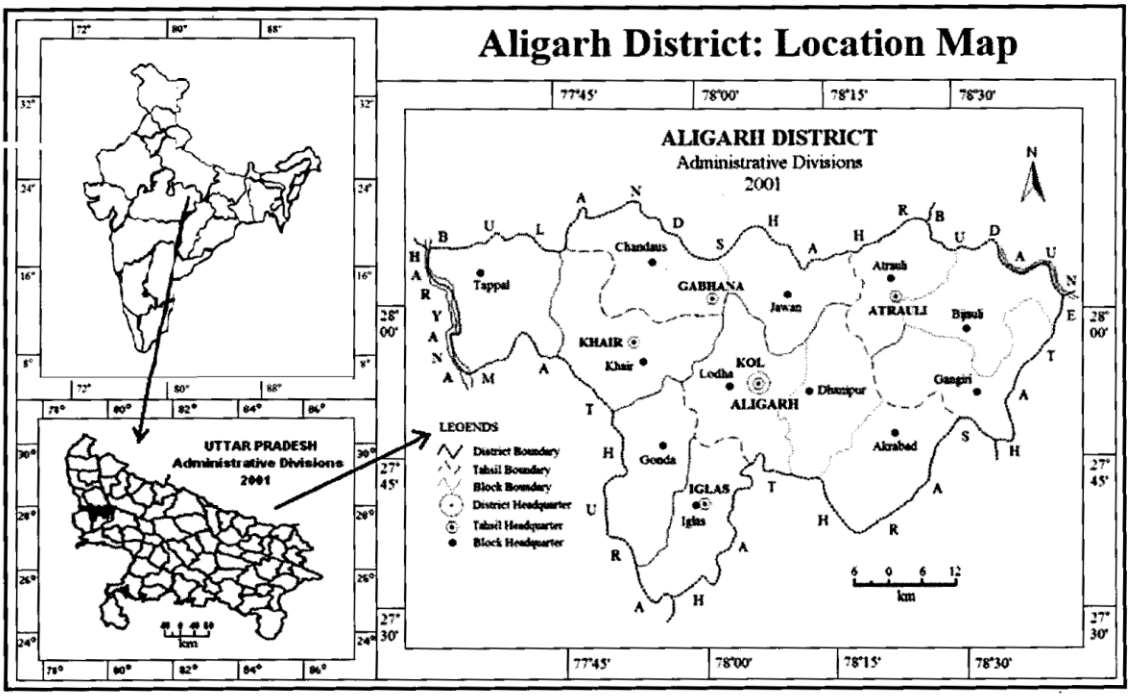
Although in Aligarh district agriculture is the prominent sector of economy involving more than 68 per cent of the population, it has been languishing for a long period of time. Therefore, an attempt has been made to identify the spatial variation of agricultural development in twelve development blocks of Aligarh district.

2. Study Area

Aligarh is an important district of Uttar Pradesh. It is situated at a distance of 130 k.m. southeast of Delhi on Delhi-Kolkata railway route. The latitude is $27^{o}29'$ to $28^{o}11'$ North latitude and $77^{o}29'$ to $78^{o}38'$ East longitude. Topographically the district represents a shallow trough-sauce

pan shape like appearance with the river Ganga in the north-east and the River Yamuna in the north-west forming the high land peripheries. Physiographically the district contains vast alluvial plains having a gentle slope from north to south and south-east. The climate is hot and dry in summer and cool and dry in winter with an intervening rainy season. The district has a total area of 3700.4 sq.km. With a population of 3,673,849 persons in 2011(provisional). From the administrative point of view the district has been divided into 12 development blocks, namely Tappal, Chandaus, Khair, Jawa, Lodha, Dhanipur, Gonda, Iglas, Atrauli, Bijauli, Gangiri, and Akrabad which include altogether 1210 inhabited villages.

Aligarh District: Administrative Divisions, 2001



Source: Census of India & Vikas Bhawan, Aligarh, 2008

Figure 1

3. Database and Methodology

Agricultural development is unquestionable a multidimensional concept of which crop productivity is one of the vital aspects. Crop productivity is to be judged not merely from quantity of production but also from the variety and quantity of the produce. The simplest and crudest measure of crop productivity is the yield per hectare of various crops. A desirable

sophistication is introduced by finding out the value of crop produce per hectare of net area sown/cropped area or per cultivator/ agricultural worker. Produce per hectare of net area sown or cropped area is an expression of the output per unit of agricultural land, and produce per agricultural worker or cultivator reflects the economic level of agricultural population. Sometimes it is standardised by computing net output (gross output minus cost of inputs) per hectare of net area sown. This computation involves several methodological problems and is generally given up in favour of a more convenient indicator of output per hectare of agricultural land or per worker.

Commercialization of agriculture is another dimension of agricultural development. The percentage of cropped area under cash crops may be used as a measure of commercialization of agriculture. The density of market centres per 1000 sq.km of area can also provide a clue to the degree of commercial agriculture. The development of agriculture is to be judged also from the degree of equity in farm incomes and nature of agrarian relation. Above all agricultural development should not produce deterioration in ecological condition. It should not lead to defacement of forests, exhaustion of soil nutrients, depletion of underground water and emergence of water logging condition. Conservation of physical resources is an integral part of any agricultural development (Krishan, 1992).

The spatial pattern of agricultural development has been measured in terms of technological factors such as chemical fertilizers (NPK), irrigation, HYV of seeds and implements.

The following thirteen indicators were selected for measuring the agricultural development.

Table 1: List of Selected Variables

S.No	Variables	Definition
1	X1	Cropping Intensity
2	X2	Irrigation Intensity
3	X3	Percentage of net area irrigated by tube-well to net irrigated area.
4	X4	Percentage of net irrigated area to net area sown.
5	X5	Percentage of area under food crops to gross sown area.
6	X6	Percentage of fertilizer consumption /hectare of gross area (in kg).
7	X7	Percentage of agricultural workers to the total main workers.
8	X8	Percentage of literate persons to the total population.
9	X9	Percentage of electrified villages to the total inhabited villages.
10	X10	. Length of roads/lakh of population.
11	X11	. Number of junior primary school/ lakh of population.

12	X12	. Number of senior primary school/ lakh of population.
13	X13	. Number of higher secondary school/lakh of population.

The present study is based on secondary source of published data for the year 2011-12 obtained from the statistical magazine of Aligarh district.

For measuring the relative score of various attributes of agricultural development in Aligarh district. Standard score technique has been applied (Z-Score).

Where $$Z_i = \frac{X_i - \overline{X}}{S.D.}$$

Zi= Standard score for the ith observation

Xi= Original value of the observation

$\overline{X}$ = Mean for all the values of X

S.D=Standard Deviation of X

Further, the results of the standard score obtained for different indicators were aggregated in order to find out the composite index or composite standard score (CSS) so that the regional differences in the levels of development of various blocks may be obtained on a uniform scale.

All the data have been arranged in descending order of composite standard score. The positive values relating to the blocks score how high level of agricultural development and negative value the low level of development.

In order to classify the blocks according to the magnitude of development, the composite scores are divided into three classes viz; high, medium and low.

4. Discussion

Agricultural development is a multidimensional process. It is a key element of rural development, there is a legitimate aspiration of the people in rural areas to improve their standard of living and to share the fruits of development. The primary objective of agricultural development is to increase growth of agricultural output. Nevertheless, the extent of utilization of agricultural potential and the levels of development attained vary from block to block.

4.1 Distribution of Variables

4.1(i) Cropping intensity (X1)

The intensity of crop refers to the use of a field several times during a cropping year. It is a measure of land efficiency, which is defined as the extent to which the net area sown is cropped or sown. The value of cropping intensity is ranging from 0.51 to 1.99 under high category which is listed in Table 2. Three blocks, namely Akrabad (1.99), Atrauli (1.08) and Gonda (0.51) come under this category. In medium category the value ranges from -0.23 to 0.31 and six blocks, namely Bijauli (0.31), Gangiri (0.09), Iglas (0.08), Lodha (0.07), Chandaus (-0.23) and Dhanipur (-0.23). Remaining blocks are under low category which ranges from -1.78 to -0.52 including Tappal (-1.78), Khair (-1.39) and Jawa (-0.52). The lowest cropping intensity is recorded in Tappal (-1.78).

4.2 (ii) Irrigation Intensity (X2)

Intensity of irrigation is defined as the percentage of the irrigation proposed to be irrigated annually. Usually the area irrigated during each crop season (Rabi, Kharif, etc) is expressed as a percentage of the CCA which represents the intensity of irrigation for the crop season. By adding the intensities of irrigation for all crop seasons the yearly intensity of irrigation to be calculated. The value of irrigation intensity is ranging from -1.75 to 1.36. The three out of twelve blocks fall under high category. It is evident from the Table 2 the top position is occupied by Akrabad (1.36) in irrigation intensity. The Z-score of the blocks categorized under three groups. The high levels of irrigation intensity are in Akrabad (1.36), Gonda (1.24) and Jawa (1.03).

The medium group ranges from -0.36 to 0.47. There are only five blocks under this category mainly Dhanipur (0.47), Atrauli (0.39), Iglas (0.11), Chandaus (0.17) and Tappal (-0.36). The blocks under low irrigation intensity ranging from -0.55 to -1.75, include Khair (-0.55), Lodha (-0.59), Bijauli (-1.52) and Gangiri (-1.75).

4.1 (iii) Percentage of net areas irrigated by tube-wells (X3)

The total irrigated area has been calculated as percent of the total irrigated area by tube-wells and further calculated Z-score of the percentage of total irrigated area. Table 2 indicates that high level of irrigation by tube-wells has been observed in Atrauli (1.03), Gangiri (1.00), Lodha (0.98) and Chandaus (0.67). The medium level of irrigation by tube-well has been observed in Jawa (-

0.21), Gonda (-0.11), Tappal (0.27), Iglas (0.43) and Bijauli (0.49). There is only three block namely Akrabad (-1.69), Dhanipur (-1.44) and Khair (-1.43) which come under the low level of percentage of irrigation by tube-wells.

4.1 (iv) Percentage of net irrigated area to net area sown (X4)

Irrigation is necessary for almost any kind of agricultural development and prerequisite for the success of modern technology in agriculture. The need of additional and artificial water supply is always felt in successful farming operation. Irrigation plays a significant role in entire agriculture sector. The changing trends in the intensity of irrigation, portrays man's dynamic attempt to overcome environmental limitations to transform the potential of the area into agricultural resources (Singh, 1974).

The total irrigated area has been calculated as percent of the total sown area and further calculated Z-score of the percentage of total irrigated area. Table 2 indicates that high level of irrigation has been observed in Akrabad (1.36), Gonda (1.24) and Jawa (1.02).The medium level of irrigation has been observed in six blocks of the study area viz; Lodha (-0.47), Tappal (-0.37), Iglas (0.10), Chandaus (0.16), Atrauli (0.39) and Dhanipur (0.46). Remaining three block namely Gangiri (-1.77), Bijauli (-1.54) and Khair (-0.57) come under the low level of irrigation.

4.1 (v) Percentage of area under food-crops to gross sown area (X5)

Food-crops usually refer to domestic production of basic staples (Cereals, Pulses, roots and Tubers). Although there are principal subsistence crops, they are also often marketed. It has been categorized into three groups such as high, medium and low with the help of calculated Z-score. The high Z-score ranging from 0.54 to 1.02 of food crops production to gross sown area has been recorded in Dhanipur (0.54), Jawa (0.64), Bijauli (0.76), Gangiri (0.81) and Akrabad (1.02). Five blocks have been fall in medium category which ranges from -0.42 to 0.41. The block under this category are Atrauli (0.41), Chandaus (0.17), Tappal (-0.27), Khair (-0.42) and Lodha (-0.42). Remaining two blocks fall under low category. These are Gonda (-0.56) and Iglas (-2.66).

4.1 (vi) Percentage of Fertilizer consumption (NPK) per hectare of gross area (in kg) (X6)

For improving the yield rate, timely and adequate provision of inputs like fertilizer, HYV seeds and insecticides is of prime importance. Chemical fertilizers have played their crucial role in increasing food grain production and solving the problem of low yield in India. The consumption of fertilizers in different blocks is ranging from -1.44 to 2.13 of their z-score. High level of consumption of fertilizer has been recorded in blocks namely Bijauli (2.13), Lodha (0.95) and Iglas (0.86). There are five blocks having medium level of consumption Akrabad (0.26), Dhanipur (0.23), Jawa (-0.01), Atrauli (-0.06) and Khair (-0.28). The low level of fertilizer consumption recorded in four blocks of the district, namely Gonda (-0.52), Tappal (-1.05), Chandaus (-1.07) and Gangiri (-1.44).

4.1 (vii) Percentage of agricultural workers to the total main workers (X7)

Like the other inputs such as chemical fertilizers, HYV seeds, machineries etc. agricultural labourers are also the important factor for agricultural development because there are many activities in the field which they perform. Table 2 indicates that highest number of agricultural labour has been found in Bijauli (1.11). Other blocks in high category are Akrabad (0.83) and Gangiri (0.93). The blocks ranging from -0.05 to 0.43 are under medium category of having numbers of agricultural labourer. Six blocks namely, Iglas (-0.05), Khair (0.23), Gonda (0.25), Tappal (0.29), Chandaus (0.38) and Atrauli (0.43) are under medium category. Remaining three blocks namely Lodha (-2.36), Jawa (-1.15) and Dhanipur (-0.88) are under the low category.

4.1 (viii) Percentage of literate persons to the total population (X8)

Education played a substantial role in the adoption of agricultural innovations and dissemination of agricultural information. The literate cultivators can make best of available resources It has been categorized into three improve agricultural condition of the area; he cultivates and can give new directions for the future development of agriculture. Therefore education may be treated one of the important instrument in the wheel of agricultural development. It has been categorized into three groups such as high, medium and low with the help of calculated Z-score. The high Z-score

ranging from 0.52 to 0.85 in terms of literacy has been recorded in five blocks of the study area namely Iglas (0.52), Lodha (0.56), Khair (0.59), Gonda (0.73) and Chandaus (0.85). Five blocks have been fall in medium category which ranges from -0.09 to 0.44, the block under this category are Tappal (0.44), Jawa (0.44), Akrabad (0.09), Dhanipur (-0.05), and Atrauli (-0.09). Remaining two blocks fall under low category. These are Bijauli (-2.05) and Gangiri (-2.05).

4.1 (ix) Percentage of electrified villages to the total inhabited villages (X9)

Rural electrification is the process of bringing electrical power to rural and remote areas. Electricity is used not only for lighting and house-hold purposes, but it also allows for mechanization of many farming operates, such as threshing, milling and hoisting grain for storage. Electrification for the development of agriculture is one of the essential requirements. It changes the traditional pattern of agriculture and helps in improving the standard of living of the farmers. The value of rural electrification is ranging from 0.61 to 1.03 under high category which is listed in Table 2. Five blocks, namely Jawa (1.03), Atrauli (1.03), Iglas (0.83), Dhanipur (0.63) and Khair (0.61) come under this category. In medium category the value ranges from -0.35 to 0.17 and four namely blocks Chandaus (0.17), Lodha (0.13), Akrabad (0.09) and Tappal (-0.35). Remaining blocks are under low category which ranges from -2.35 to -0.61 including Gonda (-2.35), Gangiri (-1.19) and Bijauli (-0.61).

Table 2: Standard score of the variables for the agricultural development in Aligarh District (2010-11) of western Uttar Pradesh (District Statistical Handbook, 2011-12)

Blocks	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	CSS
Tappal	-1.78	-0.36	0.27	-0.37	-0.27	-1.05	0.29	0.44	-0.35	-1.27	-1.36	-0.73	-0.42	-0.54
Chandaus	-0.23	0.17	0.67	0.16	0.17	-1.07	0.38	0.85	0.17	-0.21	-0.25	-0.48	-0.38	0.00
Khair	-1.39	-0.55	-1.43	-0.57	-0.42	-0.28	0.23	0.59	0.61	-0.42	0.52	-1.26	0.02	-0.33
Jawa	-0.52	1.03	-0.21	1.02	0.64	-0.01	-1.15	0.44	1.03	-0.94	-0.81	0.27	-0.61	0.01
Lodha	0.07	-0.59	0.98	-0.47	-0.42	0.95	-2.36	0.56	0.13	0.08	-0.42	-0.98	-0.61	-0.24
Dhanipur	-0.23	0.47	-1.44	0.46	0.54	0.23	-0.88	-0.05	0.63	0.57	0.36	-1.08	-0.64	-0.08
Gonda	0.51	1.24	-0.11	1.24	-0.56	-0.52	0.25	0.73	-2.35	-0.39	1.09	0.37	-0.29	0.09
Iglas	0.08	0.11	0.43	0.1	-2.66	0.86	-0.05	0.52	0.83	0.37	1.41	0.49	-0.36	0.16
Atrauli	1.08	0.39	1.03	0.39	0.41	-0.06	0.43	-0.09	1.03	1.81	-0.13	0.84	0.15	0.56
Bijauli	0.31	-1.52	0.49	-1.54	0.76	2.13	1.11	-2.05	-0.61	-0.54	-0.07	2.28	2.98	0.29
Gangiri	0.09	-1.75	1	-1.77	0.81	-1.44	0.93	-2.05	-1.19	-0.89	-1.68	-0.13	0.52	-0.58
Akrabad	1.99	1.36	-1.69	1.36	1.02	0.26	0.83	0.09	0.09	1.81	1.34	0.43	-0.35	0.66

Source: Calculated by the author.

4.1 (x) Length of roads per lakh of population (X10)

In the planned development of rural areas the development of rural roads merits the highest priority. For multifarious aspects like provision of food and labour to the cities; for balanced regional development; for curbing rural to urban migration; for improvement of agricultural productivity; for removal of socio-economic inequalities and above all if all the people have to be brought into the main stream of development, rural roads have to be provided to link all the villages in an integrated road network.

In a developing country like India, investment on rural roads has a vital role to play in waging war against rural poverty. Rural roads facilitate better goods distribution, promote the development of market centres, and provide an incentive to farmers to generate more marketable surplus. It is the rural road that delivers fertilizers, pesticides, seeds and other agricultural inputs to farmers to improve both production and productivity. A good rural road network would be able to move marketable surplus efficiently and effectively to consumption centres and promote agro-businesses. Integrated road network also facilitates farm mechanization, better mobilization of man power, effective utilization of resources and increase in use of rural infrastructure facilities.

Table 2 shows that high level of construction of rural roads per lakh of population has been observed in Akrabad (1.81), Atrauli (1.81) and Dhanipur (0.57).The medium level of road density has been observed in five blocks of the study area viz; Khair (-0.42), Gonda (-0.39), Chandaus (-0.21), Lodha (0.08) and Iglas (0.37). Remaining four block namely Tappal (-1.27), Jawa (-0.94), Gangiri (-0.89) and Bijauli (-0.54) come under the low level of road density

4.1 (xii) Number of junior primary school per lakh population (X11)

A primary school is an institution in which children receive the first stage of compulsory education known as a primary or elementary education. . The value of junior primary school is ranging from 0.52 to 1.41 under high category which is listed in Table 2. Four blocks, namely Iglas (1.41), Akrabad (1.34), Gonda (1.09) and Khair (0.52) come under this category. In medium category the value ranges from -0.42 to 0.36 and five blocks, namely Dhanipur (0.36), Bijauli (-0.07), Atrauli (-0.13), Chandaus (-0.25) and Lodha (-0.42). Remaining blocks are under low category which ranges from -1.68 to -0.81 including Gangiri (-1.68), Tappal (-1.36) and Jawa (-0.81).

4.1 (xii) Number of senior primary school per lakh population (X12)

Education is the totality of life experiences that people acquire, and which enables them to cope with and derive satisfaction from living in the world. This is because it enables them to achieve social competence and optimum individual development. It is on this premise that it is believed that the quality of a nation's education is proportional to the level of its prosperity. It has been categorized into three groups such as high, medium and low with the help of calculated Z-score. The high Z-score ranging from 0.84 to 2.28 in number of senior primary school has been recorded in Atrauli (0.84) and Bijauli (2.28). Six blocks have been fall in medium category which ranges from -0.48 to 0.49. The block under this category are Iglas (0.49), Akrabad (0.43), Gonda (0.37), Jawa (0.27), Gangiri (-0.13) and Chandaus (-0.48). Remaining four blocks fall under low category. These are Tappal (-0.73), Lodha (-0.98), Dhanipur (-1.08) and Khair (-1.26).

4.1 (xiii) Number of Higher secondary school per lakh population (X13)

A school that is intermediate in level between elementary school and college and that usually offers general, technical, vocational or college-prepatory curriculum. The Z-score of the variable number of higher secondary school per lakh of population was calculated and further divided into high, medium and low category. Table 2 indicates that high level of secondary schools has been observed in only two blocks namely Bijauli (2.98) and Gangiri (0.52).The medium level has been observed in seven blocks of the study area viz; Tappal (-0.42), Chandaus (-0.38), Iglas (-0.36), Akrabad (-0.35), Gonda (-0.29), Khair (0.02) and Atrauli (0.15). Remaining three block namely Dhanipur (-0.64), Jawa (-0.61) and Lodha (-0.61) come under the low level of higher secondary school facility.

5. Levels of Agricultural Development

To assess the level of agricultural development in Aligarh district of Western Uttar Pradesh, all the thirteen variables have been aggregated. The Z-score value of thirteen variables transformed and combined with the help of Z-score and composite score was prepared (Table 3). The composite score ranges from 0.66 (highest) in Akrabad to -0.58 (lowest) in Gangiri Block. Akrabad is the most developed block in Aligarh district and Gangiri is at the bottom. On the

basis of composite Z-score, the blocks have been categorized into three classes' viz. high, medium and low (Figure 2) which clearly shows the spatial pattern of agricultural development in Aligarh district. On an aggregate three blocks namely, Akrabad (0.66), Atrauli (0.56) and Bijauli (0.29) , which ranges their composite Z-score above 0.19, are highly developed blocks which are located in the north west and south west part of Aligarh district, the blocks recording high level of agricultural development have attained their status due to a variety of reasons. The farmers living in that portion enjoy better irrigation facilities, use of chemical fertilizers, production of food crops and other agricultural technology, high literacy rate and infrastructural facilities. Majority of the district fall under medium category having their composite Z-score ranging from -0.19 to +0.19.This category cover five blocks namely Iglas (0.16), Gonda (0.09), Jawa (0.01), Chandaus (0.00) and Dhanipur (-0.08). These blocks are located in the northern and southern part of the study area. Infrastructural facilities and irrigation facilities are the main source of agricultural development, but the use of fertilizers, literacy rate and cropping intensity are moderate, so the agricultural development in this region is moderate. Only four block having their composite Z-Score below -0.19 fall under low level of agricultural development and these are Lodha (-0.24), Khair (-0.33), Tappal (-0.54) and Gangiri (-0.58) that show low level of agricultural development. These blocks are located in the eastern, central and western most part of the district. There is lack of production of cropping intensity, consumption of fertilizers, educational and infrastructural facilities.

Table 3. The spatial pattern and the level of agricultural development in Aligarh district

z-score value	Level of agricultural development	No. of blocks	Name of the blocks
0.19 and above	High	3	Akrabad, Atrauli, Bijauli
-0.19 to 0.19	Medium	5	Iglas, Gonda, Jawa, Chandaus and Dhanipur
Less than –0.19	low	4	Lodha, Khair, Tappal and

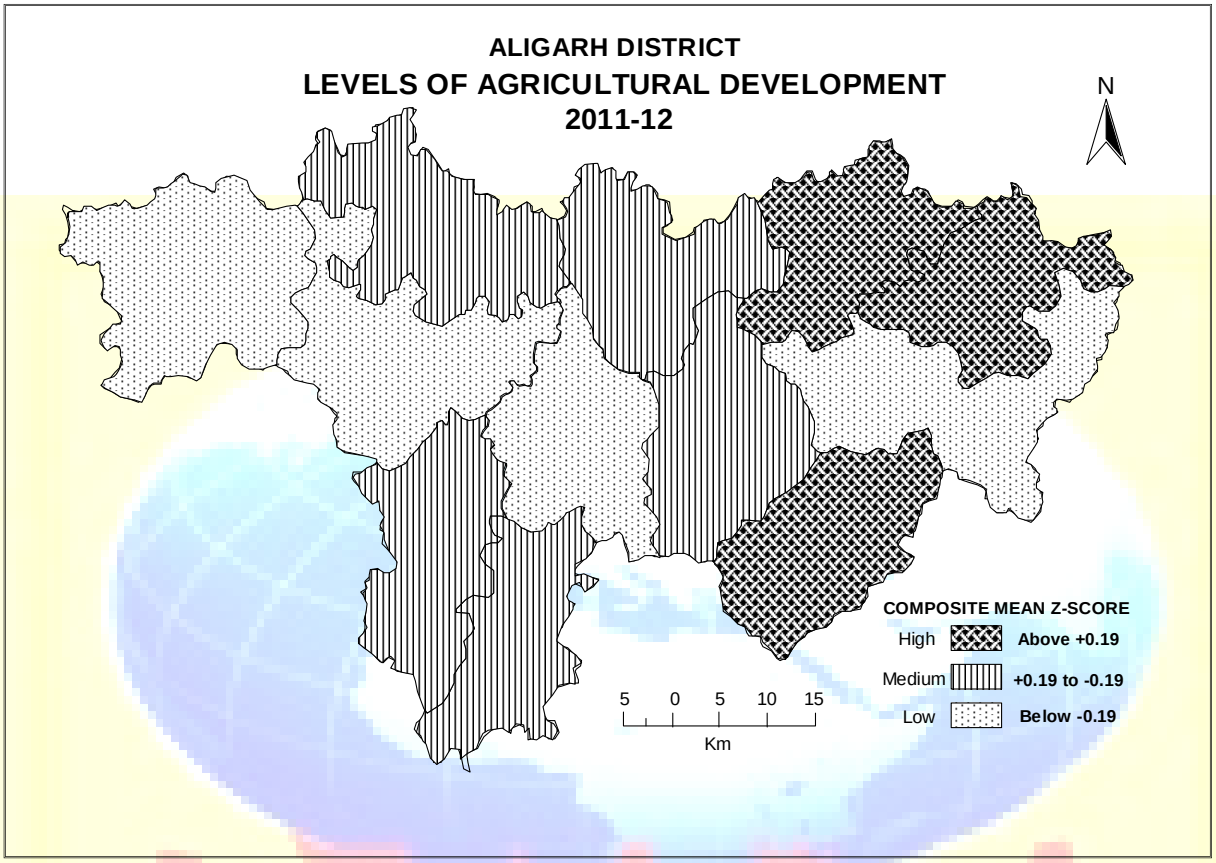


Figure 2: Aligarh District, Levels of Agricultural Development Prepared by Composite Z-Score Technique.

Conclusion

The present study reveals that the spatial distribution of variables and agricultural development is not uniform in Aligarh district. It provides very significant information about the level of agricultural development in Aligarh district of western Uttar Pradesh. The study highlight that the majority of the district come under the medium category of agricultural development which is located in the southern most part and upper central part of the study area and the high level of agricultural development is seen in blocks lying in north western and southern part of the study region, while the blocks lying on the western, central and eastern boundary of the district, are agriculturally less developed. For development there is a need for restructuring of the agriculture which has to be done within certain limits of economic, social, and political factors, as well as

the national goal; and to making the agricultural society more dynamic. The study highlights the impact of location and spatial input on the agricultural development planning in Aligarh district.

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