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Research Article

Sptio-Temporal Variation Of Population Distribution And Level Of Agricultural Productivity In Morigaon District Of Assam

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ABSTRACT

The population plays an important role in the socio-economic development of a region. Morigaon district is one of the most densely populated districts of Assam. Over the past few decades, there has been noticeable variation in the population growth across different areas within the district. In an agricultural district like Morigaon, the productivity of the land and the population are closely linked. The annual increase in population has put immense pressure on the available land resources, leading to the conversion of agricultural land for residential and other purposes. This has resulted in a decrease in the net cropped area, exacerbating the food crisis in the district. Therefore, it is urgent to measure agricultural productivity in order to identify areas with lower productivity compared to those with medium and higher productivity. In light of this, the need for agricultural production and productivity is essential in providing livelihood security to the people of the district.

In this paper an attempt has been made to identify the different agricultural productivity areas in Morigaon district and to analyse them to formulate future development of agriculture. The success of this effort is expected to enhance livelihood security for the rural population of Morigaon district. Data for this study are collected from different Government offices of Morigaon district. Field investigation is also done for the collection of primary data.

Keywords: Population growth, Productivity, Land resources, Food crisis, Livelihood

Introduction

The population plays an important role in the socio-economic development of a region. Morigaon district in Assam is one of the most densely populated districts, ranking second in terms of decadal growth rate (2001-11) and seventh in terms of population density (2011) among all districts in Assam. The district covers 1.99 percent of the total geographical area of the state which supports 3.07 percent of the total population of Assam. Agriculture is the main source of income of almost all the people of the district. Maximum income of the people comes from agriculture.

Study region

In 1989, the present Morigaon district, located centrally in the state of Assam, was upgraded from a sub-division to a new district separating from the old Nagaon district. 16 mouzas and is bordered by the Brahmaputra and Darrang district to the north, Nagaon district to the east, Karbi-Anglong and Meghalaya to the south, and Kamrup district to the west and south-west.

Its landmass extends between latitudes of 26° 2/ 24// N and 26° 28/ 12// N and between 91° 58/ 57// E and longitudes of 92° 34/ 48// E. The total geographical area of the district is 1559 sq. km. accounting for 1.99 percent of the state's total geographical area. According to the 2011 census, the district has a total population of 9,57,853, of whom 50.67 percent are males and 49.33 percent are females. About 92.35 percent of the total population of the district are rural while the remaining 7.65 percent are urban population.

Objectives

The main objectives of this study are as follows:

i) To analyse the spatio-temporal variations in population distribution and growth rate within the study area.
ii) To identify the different agricultural productivity areas in the study region and to analyse them to formulate future development of agriculture.

Methodology and Database

The analysis of the study is primarily based on secondary data collected from various sources, including the Economic Statistical Office of Morigaon, the Directorate of Economics and Statistics of Assam, the Department of Agriculture, the various circle offices of Morigaon district and the Census of India for the years 1991, 2001, and 2011. Besides these, some geographical information has been collected from field observation. The agricultural productivity of the region was measured using Kendall's Ranking Coefficient method. This involved taking into account the three-year average of each crop in a mouza. The method also considered mouza-wise data on the per-hectare yield of different crops. The yields of these crops are converted into ranks, which are then added together. The summations are divided by the number of crops included to determine the ranking coefficients of the mouzas in terms of their overall agricultural productivity. The data and information are tabulated, analysed, and interpreted before being displayed on a map.

Spatio-temporal variation of population distribution and growth rate

According to the 2011 census, the total population of Morigaon district was 957,423, with 50.67 percent male and 49.33 percent female. The population distribution in the district is uneven due to variations in physiographic conditions, soil fertility, economic conditions, transport accessibility, and other environmental factors. The northern and central parts of the district are densely populated, while the southern hilly areas have a lower population density. About 92.35 percent of the district's total population lives in rural areas, scattered over 632 villages, and depends mostly on agriculture for subsistence. The remaining 7.65 percent of the population lives in urban areas, including Morigaon Town (MB) (3.05 percent), Jagiroad (CT) (1.85 percent), Tegheria (CT) (0.85 percent), Nakhula Grant (CT) (0.40 percent), Bhuragaon Revenue Town (CT) (1.03 percent), and Moirabari Town (0.75 percent).

Based on the 2011 census, Laharighat mouza has the highest population (1,27,391 persons) among all of the mouzas in the district, comprising 13.31 percent of the total population, followed by Moirabari mouza with 1,26,227 persons, contributing 13.18 percent. Niz-Ghagua (27,067 persons) and Tetelia (31,838 persons) have exceptionally low population concentrations of 2.83 percent and 3.35 percent, respectively.

Morigaon district has a significantly higher population growth rate compared to the state average (16.93 percent). According to table 1, the population of Morigaon district increased from 6.40 lakhs in 1991 to 9.57 lakhs in 2011, representing a one-and-a-half-fold increase. The decadal variation of population growth in the district was 21.30 percent during 1991–2001, while it increased to 23.34 percent during the period of 2001–2011. In the state, however, it was 18.92 percent (1991–2001), which decreased to 16.93 percent (2001–2011). The decadal growth rate of the district is greater than the state's average, at 18.92 percent and 16.93 percent, respectively.

There has been significant variation in the mouzawise growth of population in Morigaon district during the last few decades. However, during 2001–2011, the Laharighat mouza experienced the highest growth rate of 40.99 percent, followed by the mouzas of Moirabari (35.53 percent), Tetelia (30.36 percent), Bhuragaon (28.53 percent), Manaha (25.13 percent) and Mayang (23.36 percent). In all these mouzas, the growth rate has been found to be higher than the district average (23.34 percent). On the other hand, in the mouzas of Morigaon, Uttarkhola, Silpukhuri, Gova, Mikirbheta and Dandua, the growth rate is less than the district average but higher than the state's average. In the remaining 4 mouzas, *i.e.,* Niz-Ghagua, Pokaria, Charaibahi and Bokani, the population growth rate is less than the state's average. It may be noted that a negative growth rate (-4.14 percent) was found in Bokani mouza during the decade 2001–2011 (Table 1).

Table-1
Spatio-temporal variations in population distribution and growth rate, Morigaon district, 1991-2011

Mouza	Total Population			Growth Rate	
	1991	2001	2011	1991-2001	2001-2011
1. Dandua	28,301	32,134	37,670	13.54	17.23
2. Morigaon	44,652	53,983	65,579	20.90	21.48
3. Tetelia	19,315	24,423	31,838	26.45	30.36
4. Uttarkhola	41,816	54,021	64,927	29.19	20.19
5. Charaibahi	32,691	39,364	44,034	20.41	11.86
6. Mikirbheta	28,623	33,041	38,837	15.44	17.54
7. Silpukhuri	39,990	45,815	54,342	14.57	18.61
8. Laharighat	78,270	90,357	1,27,391	15.44	40.99

9. Moirabari	71,217	93,139	1,26,227	30.78	35.53
10. Bhuragaon	57,331	66,532	85,539	16.05	28.57
11. Bokani	39,556	39,530	37,894	-0.07	-4.14
12. Gova	48,653	65,531	77,227	34.69	17.85
13. Manaha	24,691	34,733	43,463	40.67	25.13
14. Mayang	31,543	35,584	43,897	12.81	23.36
15. Niz- Ghagua	17,697	23,357	27,067	31.98	15.88
16. Pokaria	35,697	44,712	51,491	25.25	15.16
District	6,39,953	7,76,256	9,57,423	21.30	23.34
Assam	2,24,14,322	2,66,55,528	3,11,69,272	18.92	16.93

Source: Calculated from the Census of India, 1991, 2001 & 2011

Level of agricultural productivity

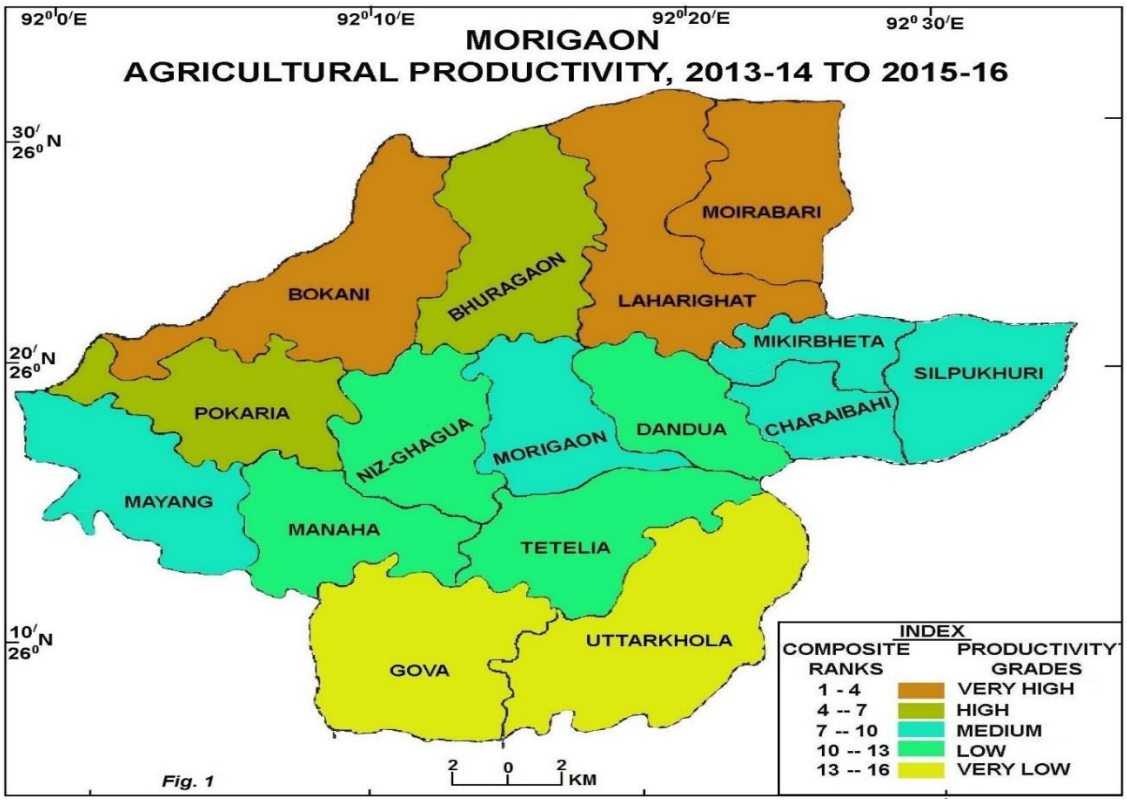
Agriculture is the backbone of the economy in Morigaon district. As a predominantly agrarian area, it is important to identify the agriculturally weaker and relatively developed areas so that an agricultural plan may be formulated to remove and minimize the regional inequalities in agricultural development of the district.

Table 2 reveals that very high agricultural productivity is found in the mouzas of Moirabari, Laharighat, and Bokani. These three mouzas are located in the low-lying land of the Brahmaputra. During the summer season, floods deposit natural silt every year. Rice and wheat are the leading crops in the Laharighat mouza, where farmers obtain two to three harvests of paddy in a year. Jute and pulses are also important crops in this mouza. In Moirabari mouza, rapes, mustard and jute are the leading crops. Pulses and rice are also important crops in this mouza. Besides, the region, especially Moirabari Mouza, is the largest producer of vegetables. Wheat and pulses are the important crops in Bokani mouza. The peasants of this region are traditionally cultivators combined with natural fertility, making the region a very high agricultural productivity region.

Table 2
Average Yield Kg/ha of Selected Crops
(Three years Average, 2013- 14 to 2015-16)
Kendall's Ranking Coefficients

Mouza	Rice		wheat		Rape & Mustard		Pulses		Jute		Summation of ranks	Ranking coefficients
	Kg/ha	Ranking	Kg/ha	Ranking	Kg/ha	Ranking	Kg/ha	Ranking	Kg/ha	Ranking		
Dandua	2361	9	894	12	421	12.5	694	11.5	1175	10	55	11
Morigaon	2219	13	1375	7	421	12.5	851	6	1231	9	47.5	9.5
Tetelia	2181	14	548	15	509	7.5	833	7.5	672	14.5	58.5	11.7
Uttarkhola	2032	16	357	16	414	14.5	296	14	727	13	73.5	14.7
Charaibahi	2317	11	1536	5	509	7.5	740	10	1679	8	41.5	8.3
Mikirbheta	2254	12	953	11	511	6	694	11.5	2350	2	42.5	8.5
Silpukhuri	2569	7	1439	6	440	11	555	13	2015	6	43	8.6
Laharighat	3289	1	1894	1	505	9	1110	3.5	2253	3	17.5	3.5
Moirabari	3052	3	1107	10	738	1	1156	2	2409	1	17	3.4
Bhuragaon	2670	5	1573	4	633	3	1041	5	2126	5	22	4.4
Bokani	2580	6	1830	2	515	4	1110	3.5	2182	4	19.5	3.9
Gova	2338	10	739	13	388	16	250	15	616	16	70	14
Manaha	2909	4	596	14	414	14.5	763	9	1007	12	53.5	10.7
Mayang	3111	2	1363	8	513	5	833	7.5	672	14.5	37	7.4
Niz-Ghagua	2074	15	1295	9	673	2	241	16	1063	11	53	10.6
Pokaria	2379	8	1578	3	456	10	1249	1	1791	7	29	5.8

Source: Data collected from Agriculture Office of Morigaon District.



The areas with high agricultural productivity are located in the mouzas of Bhuragaon and Pokaria. The natural fertility of this region is similar to that of the very high agricultural productivity region.

The medium agricultural productivity area includes the mouzas of Mayang, Charaibahi, Mikirbheta, Silpukhuri, and Morigaon. Though Mayang has access to irrigation facilities, the lack of proper treatment of the irrigated soil has led to a gradual decrease in productivity. The medium productivity of the Charaibahi, Mikirbheta, Silpukhuri, and Morigaon mouzas is due to their low natural fertility. Interestingly, many farmers in these areas have moved to other activities as a result.

The region with low agricultural productivity includes the mouzas of Niz-Ghagua, Manaha, Dandua, and Tetelia. The area with very low productivity covers the mouzas of Gova and Uttarkhola, located in the southern hilly tracts. Both the low and very low productivity regions are located in the flood-free belt, leading to depleted natural fertility after years of cultivation. Besides, the lack of irrigation facilities is also a major constraint against the intensification and development of agriculture (Fig. 1).

Conclusion

The forgoing analysis is concluded with following findings and suggestions:

1. There is spatial variation in the distribution and density of population at mouza level and also spatial variation of growth rate.
2. The pressure of population on agricultural land is extremely high in all the mouzas.
3. The level of agricultural productivity is different in different mouzas and is influenced by several factors.

The pressure of population on agricultural land has led to numerous problems. To address this issue, it is essential to control the rapid growth of population in order to reduce the pressure on agricultural land. It is also important to provide extensive irrigation facilities, modern inputs, and proper manuring to increase agricultural productivity. Effective flood control measures should be implemented in flood-affected areas, and emphasis should be placed on winter crops, particularly high-yielding varieties of paddy that require a short duration of time to grow. Furthermore, proper treatment of irrigated soil in Mayang mouza is necessary to enhance agricultural productivity.

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