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An Analysis of Concentration of Rural Population using Location Quotient: A Block Level Study of Bankura District

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ABSTRACT

The present study is an attempt to find out the relative concentration of rural population among the Community Development (C.D.) blocks of Bankura district. Bankura district ranks first among the nineteen districts of West Bengal in terms of percentage of rural population as per Census 2001 and 2011. In 2001 the district had 92.6 per cent of rural population and in 2011 the percentage figure was 91.7. As per Census 2001 and 2011 there are 22 C.D. blocks in Bankura District. In 2001, 21 blocks out of 22 blocks were totally rural in nature and in 2011, 16 out of 22 blocks were completely rural. Location Quotient (L.Q.) has been used to analyse the concentration of rural population in the C.D. blocks of Bankura district. A comparative analysis of concentration of rural population has been made between two years- 2001 and 2011.Geographic Information System (GIS) maps have been prepared using Q-GIS software to provide a spatial representation of the block-wise location quotient values for the two census years considered for the present study.

Introduction

The district of Bankura occupies the first position in terms of percentage of rural population among all the 19 districts of West Bengal in 2001 as well as in 2011. Administratively the district under study is divided

into 22 Community Development (C.D.) blocks. The district is prominently rural with about 92.6 per cent and 91.7 per cent of rural population in 2001 and 2011 respectively. In 2001, 21 blocks among the 22 blocks were completely occupied by rural population and in 2011, 16 blocks out of the total blocks were totally occupied by rural population (Table No.1). In 2001, Barjora C.D. block had rural population below hundred per cent. In 2011, Barjora, Kotulpur, Chhatna, Khatra, Simlapal and Raipur C.D. blocks had less than hundred per cent rural population. Location quotient (L.Q.) method has been used in the present study to analyse the concentration of rural population in the C.D. blocks of Bankura district in 2001 and 2011. Location quotient is the ratio of the proportion of a selected characteristics in an area to the proportion of the same selected characteristics in a region (Mahmood, 2008).

Table No.1: Block-wise percentage of Rural Population (2001 & 2011) in Bankura district

C.D. Block	% of Rural Population (2001)	% of Rural Population (2011)
Saltora	100	100
Mejhia	100	100
Gangajalghati	100	100
Barjora	90.4	87.2
Sonamukhi	100	100
Patrasayer	100	100
Indus	100	100
Jaypur	100	100
Kotulpur	100	95.5
Bishnupur	100	100
Onda	100	100
Chhatna	100	97.3
Indpur	100	100
Hirbandh	100	100
Taldangra	100	100
Khatra	100	89.4
Simlapal	100	95.0
Sarenga	100	100
Raipur	100	96.3
Ranibandh	100	100
Bankura I	100	100
Bankura II	100	100

Source: Computed by the Author.

Previous Works

The following studies have been previously conducted using location quotient.

Basu Roy, T. and Ranjan Roy (2018) in their article on "A Variability Study on Spatial Concentration of Different type of Disabilities in North Bengal and Murshidabad" have shown how location quotient method along with other methods can be applied to study the spatial variation and spatial concentration of various kinds of disabilities in different districts of North Bengal and the district of Murshidabad.

Kumar Bushan et. al. (2019) in their research paper on "Concentration of Scheduled Caste Population using Location Quotient Method in Jammu Province" has discussed about the spatial distribution of scheduled caste (SC) population in all the tehsils containing SC population of Jammu province. The number of tehsils with SC population has increased over the years from 1981 to 2011. They have studied concentration of SC population in the tehsils of Jammu province using location quotient. Spatial representation of SC population has been done through GIS map. Concentration of SC population in the tehsils were determined on the basis of the calculated location quotient values. Based on the calculated location quotient values concentration of SC population in the tehsils was categorized as very high, high, low and very low.

Abdullahi, A. and U.Y. Abdullahi (2019) in their research paper on "The Use of Location Quotient (L.Q) to Determine the Spatial Concentration of Health Care Facilities in Relation to Population in Gombe State" have studied about the spatial distribution and spatial concentration of health care facilities in Gombe State. The study is based on secondary data. Location quotient method and GIS techniques have been used to identify the existing disparities in the distribution of health care facilities in different areas of the selected state. The study concluded with various recommendations about removing the existent health care disparities.

Benassi F. et. al. (2022) in their research paper on "Location Quotient as a local index of residential segregation. theoretical and applied aspects" have discussed about the importance of the method of location quotient to determine segregation of residential areas. They have elaborated on the concepts of residential segregation and location quotient. They have applied the method of location quotient to study residential segregation in the Milan Metropolitan Area. They have concluded their study stating the drawbacks of location quotient method and have suggested for a refined and better measure of Locational Differential Index (LDI).

Deshmukh Nikhil (2023) in his research paper on "Geographical Analysis of Location Quotient of Rural Population in Chandrapur District of Maharashtra State" has elaborated about the concentration of rural population in Chandrapur district of Maharashtra using location quotient method. The study is based on secondary data. He has used census 2001 and 2011 data. Location quotient values have been spatially represented through GIS (Geographic Information System) maps.

Though several studies have been done using location quotient, but the present study which uses location quotient method to analyse the concentration of rural population in Bankura district of West Bengal have not been done earlier. Herein lies the distinctive of the present study.

Objectives

1) To find out spatial distribution of rural population among the C.D. blocks of Bankura district.
2) To analyse the concentration of rural population in the C.D. blocks through location quotient.

Materials and Methods

The present study is based on secondary data. Census 2001 and 2011 data have been used for the present study. District Census Handbook of Bankura for both the census years has been used as references. To analyse the concentration of rural population in the 22 C.D. blocks of Bankura district location quotient method has been used. Location quotient is used to find out the concentration of an activity or population group in one small part of a large area (Johnston, 2005). Location quotient has been calculated using the formula as mentioned below. Based on administrative hierarchy the areas selected for study can be states of a country, districts of a state or blocks of a district etc. To provide a spatial representation of the block-wise location quotient values, Geographic Information System (GIS) maps have been prepared for both the census years-2001 and 2011. The GIS maps have been prepared using Quantum GIS (Q-GIS) software.

$$\text{Location Quotient for Rural Population} = \frac{r_i/p_i}{R_i/P_i}$$

Where r_i= Rural Population of a C.D. block

p_i= Total Population of a C.D. block

R_i= Rural Population of the District

P_i= Total Population of the District

Study Area

Among the nineteen districts of West Bengal, Bankura ranks first in terms of percentage of rural population both in 2001 (92.6) and 2011 (91.7). Bankura district is located in the western part of the state. It extends from 22°38'N to 23°38' N latitudes and 86°36'E to 87°46' E longitudes (Census 2011). The district has 22 C.D. blocks as per Census 2001 and 2011. In 2001, 21 blocks were totally rural in nature and the figures for the same is 16 in 2011. The total population of Bankura district in 2001 was 3192695 which increased to 3596674 in 2011. Total rural population in the district in 2001 was 2957447 which increased to 3296901 in

2011. Among the 22 C.D. blocks, in both 2001 and 2011 Onda has the highest rural population and highest total population and Hirbandh has the lowest rural population and lowest total population.

Results and Discussion

The calculated location quotient values for the year 2001 have been shown in Table No.2. It can be seen that except C.D. block Barjora (L.Q. value <1) all the blocks have location quotient values greater than 1(>1) i.e. 1.08. These 21 C.D. blocks consist of only rural population. To provide a spatial representation, GIS map (Map No.1) has been prepared to show the block-wise location quotient values.

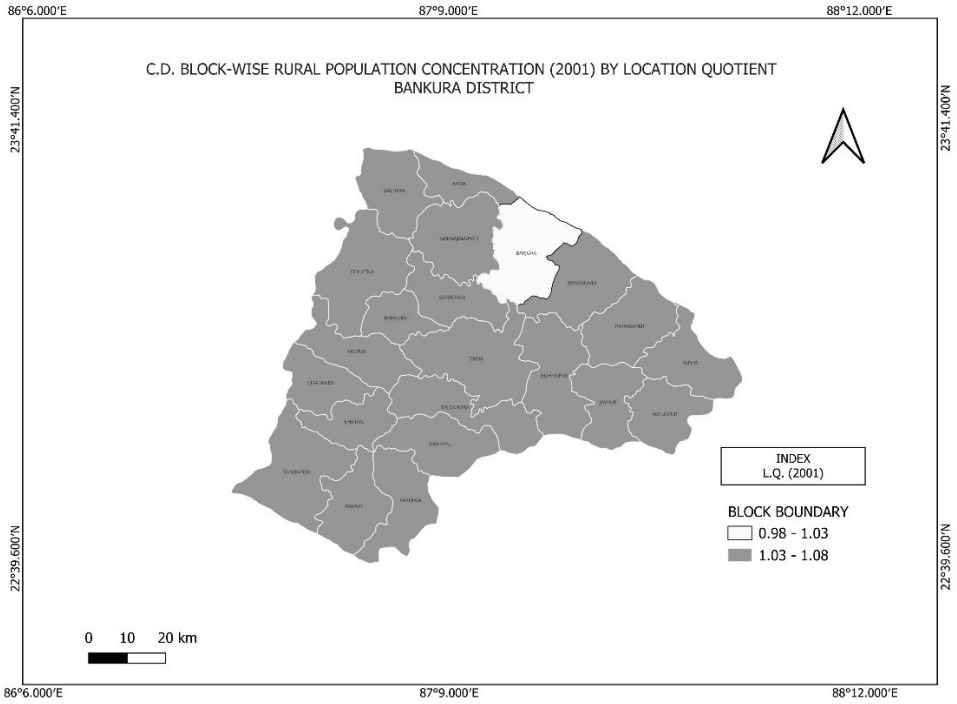
Table No.2: Location Quotient values (2001) of the C.D. blocks of Bankura district.

C.D. Block	Total Population	Total Rural Population	Location Quotient (2001)
Saltora	121552	121552	1.08
Mejhia	76123	76123	1.08
Gangajalghati	162007	162007	1.08
Barjora	179007	161841	0.98
Sonamukhi	142328	142328	1.08
Patrasayer	164060	164060	1.08
Indus	152847	152847	1.08
Jaypur	141497	141497	1.08
Kotulpur	167547	167547	1.08
Bishnupur	138768	138768	1.08
Onda	220572	220572	1.08
Chhatna	169215	169215	1.08
Indpur	137825	137825	1.08
Hirbandh	72502	72502	1.08
Taldangra	128747	128747	1.08
Khatra	102569	102569	1.08
Simlapal	127445	127445	1.08
Sarenga	95128	95128	1.08
Raipur	151293	151293	1.08
Ranibandh	104326	104326	1.08
Bankura I	95840	95840	1.08
Bankura II	123415	123415	1.08
Total Population	**3192695**	**2957447**	

Source: Computer by the Author.

Map No.1: C.D. Block-Wise Rural Population Concentration (2001) by Location

Quotient



Source: Prepared by the Author.

In Table No.3 it can be seen that in 2011 C.D. blocks Barjora and Khatra have L.Q. values less than 1 and the remaining 20 blocks have L.Q. value greater than 1. The block-wise location quotient values have been spatially represented through GIS map (Map No.2).

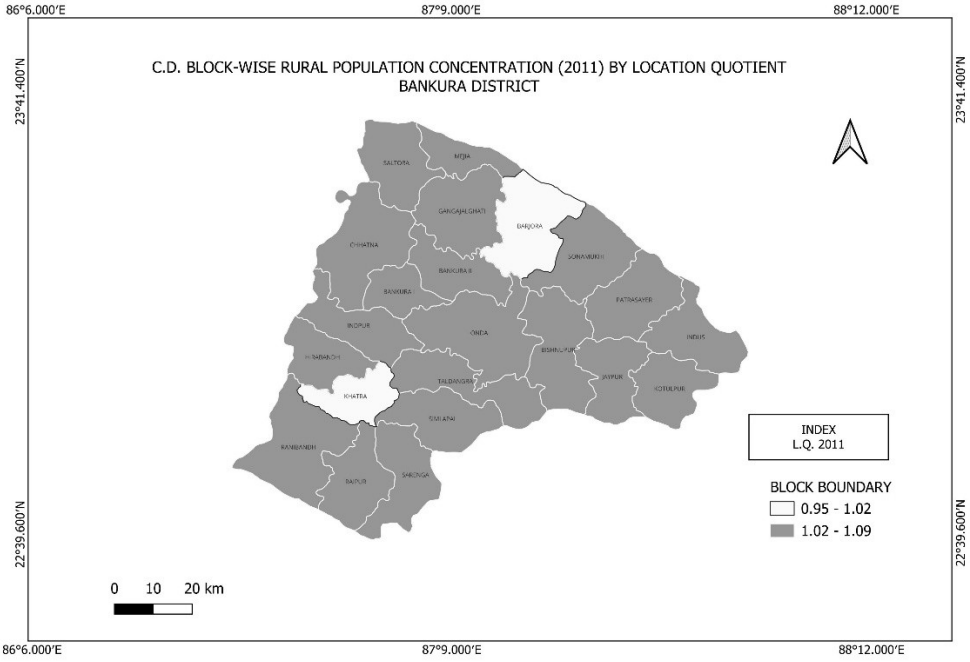
Table No.3: Location Quotient values (2011) of the C.D. blocks of Bankura district.

C.D. Block	Total Population	Total Rural Population	Location Quotient (2011)
Saltora	135980	135980	1.09
Mejhia	86188	86188	1.09
Gangajalghati	180974	180974	1.09
Barjora	202049	176263	0.95
Sonamukhi	158697	158697	1.09
Patrasayer	184070	184070	1.09
Indus	169783	169783	1.09
Jaypur	156920	156920	1.09
Kotulpur	188775	180292	1.04
Bishnupur	156822	156822	1.09
Onda	252984	252984	1.09
Chhatna	195038	189712	1.06
Indpur	156522	156522	1.09
Hirbandh	83834	83834	1.09
Taldangra	147893	147893	1.09

Khatra	117030	104592	0.97
Simlapal	143038	135832	1.04
Sarenga	106808	106808	1.09
Raipur	171377	165097	1.05
Ranibandh	119089	119089	1.09
Bankura I	107685	107685	1.09
Bankura II	140864	140864	1.09
Total Population	**3596674**	**3296901**	

Source: Computer by the Author.

Map No.2: C.D. Block-Wise Rural Population Concentration (2011) by Location Quotient



Source: Prepared by the Author.

Main Findings

Bankura district is rural in nature with about 91.7 per cent of rural population in 2011. There is a slight decline (0.9 per cent) from 2001(92.6 per cent). The calculated location quotient values of the C.D. blocks of the district show that in 2001, only in Barjora the value is less than 1. The other twenty-one C.D. blocks in 2001 have L.Q. values greater than 1 indicating that the rural population is highly concentrated in these blocks in comparison to the district as a whole. In 2011, Barjora and Khatra C.D. blocks have L.Q. values

less than 1. The other twenty C.D. blocks have L.Q. values more than 1 exhibiting high concentration of rural population in these blocks when compared to the whole district.

Conclusion

Bankura district houses a very high percentage of rural population. Census data of 2001 and 2011 clearly indicates the dominance of rural population in all the C.D. blocks of the district. Though the percentage of rural population shows a slight decline (0.9 %) in 2011 from that of 2001 but still it holds a large portion in the total population of the district. High concentration of rural population for both the census years is more evident through the location quotient values of the C.D. blocks. Almost all the C.D. blocks with the exception of one in 2001 and two in 2011 have a high concentration of rural population (L.Q. value >1) in comparison to the whole district. This provides a clear indication of the highly rural nature of Bankura district.

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