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Dr. Nirmalya Das
Assistant Professor & P.G. Co-ordinator of Geography Department, Panskura Banamali College, Purba Medinipur, WB, India

Rajeeb Samanta
Research Scholar, Department of Applied Geography, Ravenshaw University, Cuttack, Odisha, India

Correspondence:
Dr. Nirmalya Das
Assistant Professor & P.G. Co-ordinator of Geography Department, Panskura Banamali College, Purba Medinipur, WB., India

Spatial Distribution of Markets of Purba Medinipur, West Bengal

Dr. Nirmalya Das, Rajeeb Samanta

Abstract
The spatial distribution of market of an area is a central theme in marketing geography. The market pattern denotes the inter-market spacing from one another. In a uniform geographical condition socio-economic functions have played instrumental role in the development of market within a region. Inter market distance are largely depends on urbanization rate, consumer behavior, connectivity as well as social opportunities. In this respect a widely known analytical tool i.e. nearest neighbour techniques has been applied. The study reveals that the market distribution of Purba Medinipur district of West Bengal is random. On the other hand blockwise (25 blocks) scenario reveals a different pattern, i.e., in eleven (11) blocks the pattern of market distribution are cluster where as another twelve (12) blocks and two (2) blocks have random and uniform market pattern respectively.

Keywords: Market spacing, consumer behavior, urbanization, nearest neighbour.

1. Introduction
Markets have played a vital role in the socio-economic development of a region. From the early stage of transformation of human settlements market centers were the point of meeting of both sellers and buyers of a region. The term 'market' is spatially related with 'centers' or 'places' and economically with 'business' or 'trade'. All these words are commonly used in the literature of economic geography. The territorial extensions of the markets are varying on nature from a village to the level of a metropolis. According to Berry (1967) [1] it is a place where consumers and producers from various settled areas of a region as well as from the wider surrounding area meet a permanently fixed time for transacting business and it may, in accordance to the magnitude of exchange take the form of exchange or may take a periodic form. In all region of the world, market centers are varying in size, nature and hierarchy but their functioning pattern is basically the same. All these factors have created the demand of the masses for the market. Gradually with the increases of time the changing demands formed a complementary region around the market centre which transformed the market as a central place of the region. The market activities are an integral part of settlement system where exchange of goods and services by people attracted from the surrounding areas emerge, therefore, as central places. The economic transaction of business in a market centre on regular basis creates a centrality of location by the consumers. In any region, consumers may follow the shortest route for purchasing goods from the market. So, distance is an important factor which influences the process of market centrality. According to Berry[2] that the consumer prefer the shortest distance for frequent purchase for a single, multipurpose, longer and costlier journey (perhaps for a better choice, profit may be for psychological change on their transacting activity) thereby implying the meaning of different order of centrality for differing activities and showing the probable existence of variety of central places. The size and activity of central place depends on the services they render. Both higher and lower order markets within a system have some modality over the surrounding areas. The small rural settlement of lower order market functions are related with higher order urban markets. Sometimes, the higher order centers may not be an urban centre but huge services can change it into an urban agglomeration. The rural and urban service centers serve the demand of the surrounding areas through hierarchical functions in transaction of goods and services.

Here, the concepts of marketing activities in a lower or higher order are spatially organized and flow of economy within the system can help the process of regional development. The service area of a market depends on various factors like location, population size, transportation, economic status of the area and many other physical conditions also. Theoretically, the boundary of a service centre or a market will be a circular pattern. The circular boundary of an adjacent service centers will create a gap or unnerved area between the markets and sometimes an overlapping situation may occurred. C. J. Golpin [3] first proposed the idea that the service areas of a rural service centre logically and therefore theoretically is to be bounded by a circle which would overlap with the circular boundary of six adjacent areas of six other similar rural service centers. Latter, this concept was advocated by W. Christaller [4] and also considered by August Losch [5]**.** According to Losch the service area of market centre to avoid overlapping is bound to be hexagonal rather circular. The geometric pattern of rural service centers is obviously maintain a hexagonal type because of any seven centers and their service areas get eliminated on the boundaries when overlap. Most of the theoretical models are based on some pre-assumptions for the delimitation of market area boundary. The common assumptions are:

i. size of the market area,
ii. size of the complementary area depends on size of the market,
iii. all market centers are having nesting pattern of market areas which form a spatial system.

Dacey support the work of Christaller-Losch that the specialized goods and services supplied in the centers of each of the three successively higher functional orders with their respective areas arranged in an inter locking hexagonal point lattice. The above discussion shows an ideal pattern of development of market boundary, but the actual observation shows the deviations from the idealized hexagonal pattern. According to Kolb (1923) [6], the higher order centers apparently dominate the immediately neighbouring centers of lower order functions and provide them with goods and services which are only available in the higher order centers. Later on, Brush (1953) [7] and Davies (1967) [8] has been explained about the deviation in their empirical studies. In real situation, lower order centers do not survive who are located just near the higher order centre. Sometimes the higher order centre may capture the lower order by the strong attraction of higher level services. So, in most of the cases the lower order centers were developed away from the higher order centre in favorable locations. Thus, the lower order markets have been kept their identity within the complementary region through a spatial clustering arrangement.

2. Study area

The distributional pattern of markets and their dynamics of the study area are based on observation of 58 identified rural markets occurring in twenty five CD blocks of Purba Medinipur district in the southern part of West Bengal. This southern most district of the Burdwan Division, extending over an area of 4,151.64 square kilometres, is situated between the parallels of 21º36´35"N and 22º57´10"N latitudes and 86º33´50"E and 88º12´40"E longitudes. Balasore district of Odisha located on the south-western border whereas the Bay of Bengal in the south; the Hooghly river and South 24 Parganas district to the east and Howrah district to the north-east.

3. Objectives

1. To study the market pattern of Purba Medinipur district.
2. To find out blockwise market pattern of Purba Medinipur district.
3. To find out the causes of different distributional market pattern of Purba Medinipur.

4. Materials and Methodology: Distance between markets along the roads is measured from Purba Medinipur district planning Map series prepared by National Atlas Thematic Mapping Organization (NATMO). A technique for identifying nearest neighbour distance between vegetation was developed originally by Clark and Evans (1954) [9] in biological science. Dacey (1962) [10] introduced into geography the technique of nearest neighbour analysis in geography for settlement pattern analysis. Nearest Neighbour Index (NNI) which express as Rn value is the measure of the degree of departure from randomness in either of two directions: towards clustering or towards uniformity that ranges from 0 (clustered pattern) through 1 (random pattern) to 2.15 (uniform pattern). Statistical method for computing Nearest Neighbour Index is:

Rn = do/de

de =$\sqrt{N/A}$

Where,

Rn = Nearest Neighbour Index,

do = mean observed distance of nearest neighbor settlements,

de = mean expected distance of settlements,

N = total number of settlements,

A = total area of the concerned region

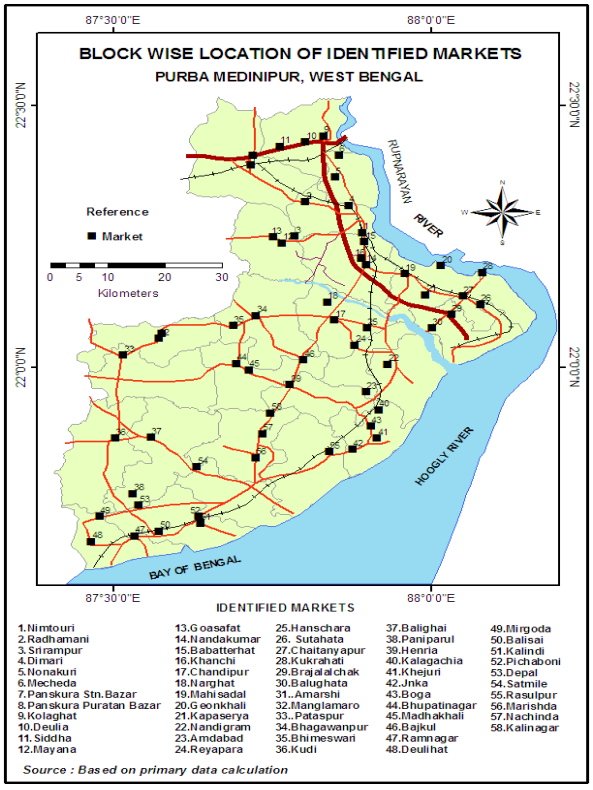

Fig 1: Location of identified markets of Purba Medinipur

5. Market pattern of Purba Medinipur: Market distributional pattern of Purba Medinipur depicts overall market spacing within the district. Table No.1 presents that Nearest Neighbour Value (Rn) is 0.612002241 i.e. random in nature. So there is no concentration of market pockets is found at district level.

Table 1: Nearest markets of Purba Medinipur with direct distance (Showing market distribution pattern)

Sl. No	Nearest Market	Direct Distance (km)
1	Nimtouri - Babatter Hat	1.92
2	Nimtouri - Dimari	6.33
3	Radhamoni - Dimari	7.07
4	Srirampur - Mayna	2.47
5	Nonakuri - Mecheda	4.47
6	Panskura Stn Bazar - Panskura Puratan Bazar	1.93
7	Kolaghat - Deulia	3.18
8	Deulia - Sidda	4.46
9	Mayna - Goasafat	1.96
10	Nandakumar - Khachi	1.49
11	Chandipur - Narghat	4.12
12	Mahisadal - Geonkhali	5.96
13	Kapaserya - Brajalalchak	5.89
14	Nandigram - Reyapara	10.54
15	Amdabad - Kalagachia	4.41
16	Reyapara - Hanschara	4.06
17	Sutahata - Chaitanyapur	3.33
18	Chaitanyapur - Kukrahati	6.08
19	Brajalalchak - Balughata	4.21
20	Amarshi - Manglamaro	1.10
21	Manglamaro - Patashpur	6.71
22	Bhagawanpur - Bhimeswari	4.11
23	Kudi - Balighai	5.72
24	Paniparul - Depal	2.49
25	Henria - Bajkul	4.90
26	Kalagachia - Boga	3.85
27	Khejuri - Boga	2.74
28	Janka - Rasulpur	4.00
29	Bhupatinagar - Madhakhali	2.31
30	Ramnagar - Balisai	4.19
31	Deulihat - Mirgoda	5.39
32	Kalindi - Pichaboni	1.41
33	Satmaile - Balighai	10.06
34	Marishda - Nachinda	5.16
35	Nachinda - Kalinagar	4.68
	Total Distance(km)	*152.74*
	Mean Distance(d)	*2.63*
	No. of Markets(N)	*58*
	Area of the District(sq. km)(A)	*4295*
	$Rn=2d\sqrt{N/A}$	*0.612002241*
	Pattern	*RANDOM*

Source: *Prepared by the author from district map*

6. Block level market pattern of Purba Medinipur: Block level analysis reveals different picture in comparison to district level analysis. Table No.2 gives blockwise market pattern of Purba Medinipur district.

Table 2: Blockwise market distribution pattern of Purba Medinipur (Based on Nearest Neighbour Technique of Clark and Evan)

Sl No	Block	Rn (Nearest neighbour value)	Pattern
1	Tamluk	1.36	Random
2	Sahid Matangini	0.58	Cluster
3	Panskura - I	0.18	Cluster
4	Panskura - II	1.09	Random
5	Moyna	2.40	Uniform
6	Nandakumar	0.45	Cluster
7	Chandipur	0.49	Cluster
8	Mahishadal	0.41	Cluster
9	Nandigram-I	1.04	Random
10	Nandigram-II	1.63	Random
11	Sutahata	1.15	Random
12	Haldia	0.39	Cluster
13	Potashpur-I	0.12	Cluster

14	Potashpur-II	1.77	Random
15	Bhagawanpur-I	0.43	Cluster
16	Egra-I	0.78	Cluster
17	Egra-II	1.17	Random
18	Khejuri-I	1.92	Random
19	Khejuri-II	0.83	Cluster
20	Bhagawanpur-II	1.76	Random
21	Ramnagar-I	1.26	Random
22	Ramnagar-II	0.63	Cluster
23	Contai-I	1.65	Random
24	Contai-II	1.72	Random
25	Contai-III	2.88	Uniform

Source: *Prepared by the author from table no 1.*

The blocks have been taken as the areal unit for measuring of Rn values. On the basis of the results obtained, three basic spatial patterns of settlement are identified. According to Rn value of markets 44 percent blocks are clustered, 48 percent are random and only 8 percent are uniform.

Table 3: Blockwise percentage of market distribution pattern of Purba Medinipur district

Pattern	Block	No of blocks	% of blocks
Clustered	Sahid Matangini, Panskura – I, Nandakumar, Chandipur, Mahishadal, Haldia, Potashpur-I, Bhagawanpur-I, Egra– I, Khejuri– II, Ramnagar -II	11	44
Random	Tamluk, Panskura – II, Nandigram-I, Nandigram-II, Potashpur-II, Egra-II, Bhagawanpur-II, Ramnagar-I, Contai-I, Contai-II. Sutahata, Khejuri-I, Ramnagar -I	12	48
Uniform	Moyna, Contai-III	2	8

In uniform spatial distribution of markets are spaced equal intervals apart, the distance between a market and its nearest neighbor being exactly the same for all markets. In this case, markets are located along straight lines, which together may form a lattice of parallelograms. This kind of distribution is very rare which depict the homogeneous distribution of physical phenomenon along with this economic factor like connectivity, consumer behavior more or less equal.

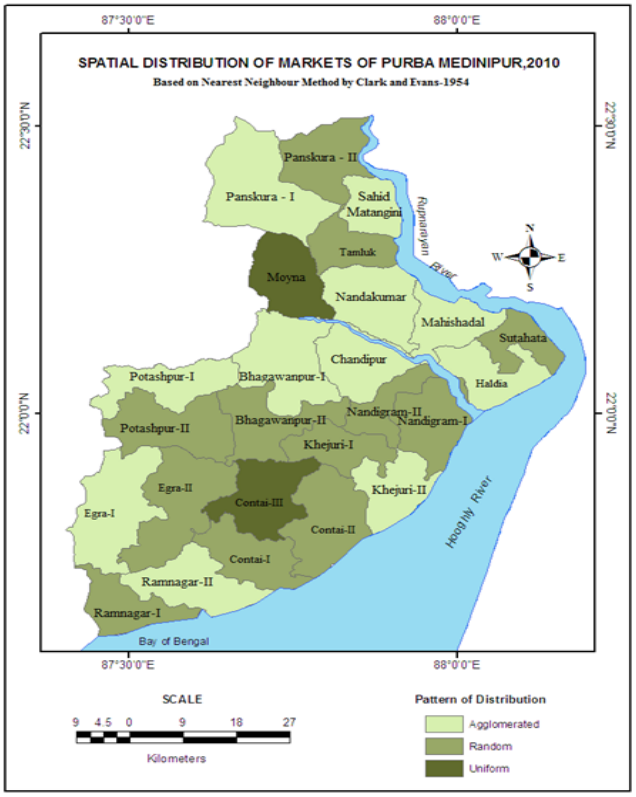

Fig 2: Blockwise market distribution pattern of Purba Medinipur

Random spatial pattern of market depends on density of settlement of the block. Random pattern is found near about 48 percent of identified market of the district where market related economic factors are evenly distributed i.e. maximization of entropy has been taken place. Spatial concentration of the blocks which shows random market pattern are found middle potion of the district.

Clustered pattern of markets are closely related each other which occur due to improper economic process and regional disparity in terms of development. Clustered market are found in those blocks where rate of urbanization is higher and number of municipalities are situated as for example Panskura-I, Haldia, Sahid Matangini, Panskura-I, Egra–I and Khejuri–II.

7. Major findings

Major findings of the study are as follows:

1. The market pattern of Purba Medinipur district is random.
2. The blockwise market pattern of Purba Medinipur district are varies 44 percent blocks are clustered, 48 percent are random and only 8 percent are uniform.
3. Urbanization rate, level of connectivity, pattern of settlement agglomeration and consumer behavior the main causes of market pattern of Purba Medinipur

8. Concluding remarks: The study gives emphasis on market pattern of Purba Medinipur. The block wise spatial patterns of the markets are three types and these are clustered, random and uniform among which clustered and random shows significant sharing i.e. 44 and 48 percentage of total markets of Purba Medinipur. Factors like rate of urbanization, connectivity, levels of development play significant role in the distributional pattern of the district.

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