"Geographical Analysis of Types of Rural Settlement in Nashik District, Maharashtra"

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Abstract

The main objective of the present study is to identify the types of rural settlements and the influencing factors in the study area. For the detail analysis of rural settlement, degree of concentration has been calculated by using the **Bernard's (1931)** method. Present study is mainly based on secondary data and it is collected from the Census Handbook of Nashik District, 2011. These calculated index shows that there is relatively high concentration of settlements in the Niphad, Malegaon and Deola tahsils due to favourable natural factors such as fertile soil and availability of good irrigation facility. The most part of these regions are occupied by the Godavari and Tapi River. The index of concentration is low in the western part of study area which is characterized by the hilly area and it is mainly in Peth and Surgana tehsils. The index of concentration is moderate in Nashik, Chandwad, Sinnar, Dindori, Baglan, Yeola & Nandgaon Igatpuri, Trimbak & Kalwan tahsils of the study area.

Keywords: Rural Settlement, Concentration Index, Dispersed Settlement, Compact Settlement and Semi-Compact Settlement.

Introduction:

In geography, settlement studies hold a significance place because settlements are viewed as a fundamental expression of relationship between man and environment **(Sharma, 2015)**. The settlements are considered as points of population concentration. Human settlement also refers to the grouping of people and houses. Settlement is the place where people established their permanent residence. On the basis of socio-economic characteristics, occupational structure, way of life and population size, human settlements are classified into two main two types. They are Urban and Rural settlement. Rural settlements are those where people are mostly engaged in agriculture and allied activities whereas urban settlements are those whose residents are engaged in non- agriculture activities **(R.L.Singn, 2002)**. Rural and Urban settlements are classified in to their sub-types. For that purpose various methods are introduced by geographers and scholars. Aurousseall (1920), Bernhard (1931), Pawlowski (1938), Debouverie (1943), Trewartha (1946), Mandal (1972), Hudson (1976), Gilg (1996) and many other Geographers have explained the types of rural settlements on the basis of various criteria's and statistical methods. The rural settlement is, as compared to its urban counter-part, a relatively small and simple agglomeration of such building at a favourable and convenient site **(Singh & Kumar, 2018)**.

Concentration of settlement indicates the total area under settlement or built up area **(Nandi and Mistri, 2018). R. L. Singh (1955)** describes four main types of settlement such as Compact Settlements, Semi-Compact (Hamleted cluster), Semi-Sprinkled (fragmented or Hemleted settlements) and Sprinkled or Dispersed settlement. All human settlements are different from one another depending upon the surrounding environment. Hence, rural settlements show the reciprocal relationship of human occupance features and environment **(Singh, 1961)**.
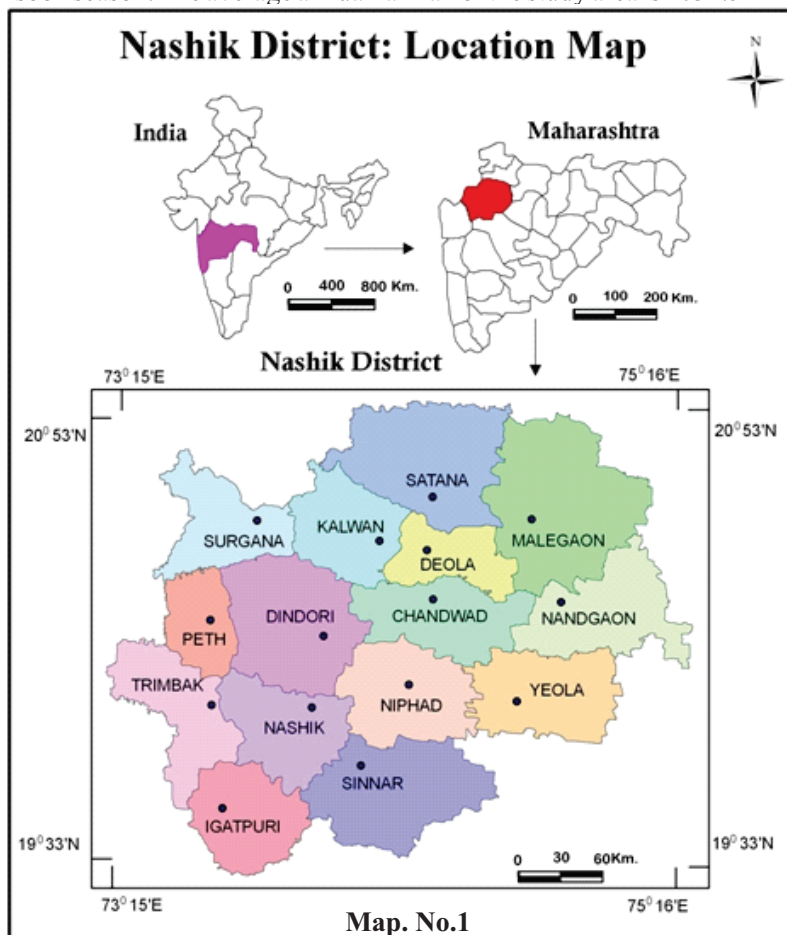
In India settlement structure is diversified in terms of dispersed to nucleated or in size from a hamlet to large villages **(Dey & Bhaduri, 2016)**. Compact settlement are mostly found in the highly productive alluvial plains, whereas dispersed settlements are generally found in the areas of extreme climate, hilly tracts, thick forests, grasslands, poor agricultural land, areas of extensive cultivations

and areas where it is essential that farmer should live on his agricultural land rather than village *(Majid Husain,2018)*. Rural settlements in the developing countries are large in number and poorly equipped with infrastructure *(Ruchi, 2020.)*. Type and pattern of rural settlements is entirely depends on physical and socio-economic condition of the region. Therefore settlements are not observed same everywhere on the earth surface.

Study Area:

Nashik district is the third largest district in Maharashtra in terms of population of 6,107,187 and occupying an area of 15,582 square kilometres and located in the northern part of Maharashtra State. It extends from 19˚ 33' to 20˚ 53' North latitude and 73˚ 15' to 75˚ 16' East longitude. It is bounded by Jalgaon and Aurangabad districts in the east, Dhule district in the north, Ahemadnager district in the south, Gujarat state in the north- west and Thane district in the south- west. The Nashik district has 15 tehsils, which are grouped into four sub-divisions. It includes Nashik, Malegaon, Niphad and Kalwan sub division.

The entire Nashik district is underlain by the basaltic lava flows. The district is a part of Deccan plateau of the Peninsular India and formed by basaltic rocks. The elevation of the study area is varying between 300 Metres to 600 Metres from the sea level with lofty peaks. The district has two main rivers, the Godavari and the Girna. The climate of the district is generally observed dry except during the monsoon season. The average annual rainfall of the study area is 1034.5mm.

Map. No.1

Nashik district is 15,530 sq. kms proportion with the Maharashtra state about 5.05 %. Out of which 57.47 % is rural and 42.53 % is urban. According to the 2011 census, Nashik district had population of 6,107,187 of which male and female were 3,157,186 and 2,950,001 respectively. Nashik has a sex ratio of 931 females for every 1000 males. Scheduled Castes and Scheduled Tribes make up 9.08 % and 25.62 % of the population respectively. The density of population is 393 persons per sq. km. Among the 35 Districts of the State, the District ranks 3rd in terms of area, 4th in terms of population and 7th in terms of population density. Location of the study area is showed in Map. No.1. As per the 2011 census of India, Hindu was the principal religion in the district at 85.73 percent of total population whereas Muslims constituted 11.35 percent of the district's population. Buddhist, Jain, Christians constituted 1.55 %, 0.63 %, 0.39 % of the population respectively. Remaining 0.16 percentage people not stated their religion. There are 1919 villages are located in the study area.

Objectives:
The main objective of the present study is to identify the types of rural settlement and their affecting factors in the study area.

Database and Methodology:
Present study is mainly based on secondary source of data. Secondary data obtained from socio-economic abstract of the Nashik district (2020), Census of India Website and Nashik District Gazetteers. The tahsil has been taken as a unit for spatial analysis of rural settlement of the Nashik district. For reference purpose some books, research papers, websites articles are also used. Data is processed and represented with the choropleth map by using GIS techniques. The formula proposed by Bernhard (1931) for identification of types of rural settlement, has been used for the present study. Degree of Concentration (settlement) Index is calculated for each tehsils by using following formula given by Bernard (1931).

$$K = S/M/N^2$$

Where,
K = Degree of Concentration
S = Area of the tahsil
M = Total number of houses in the tahsil
N = Number of settlement groups in the tahsil.

Results and Discussion:
The index of concentration has been calculated by simple formula used Bernards Method. After calculating the index of concentration for each tahsil settlement, the Nashik district has four types of rural settlements. They are dispersed, semi sprinkled, semi compact and compact settlement. Table No.2 and Map No.2 shows the types of settlements and degree of concentration of settlement in the study area.

Dispersed Settlements:
Dispersed settlement is also known as isolated settlements, which is characterized by units of small size, which may consist of a single house to a small group of houses. These type of settlements are mostly observed in the tahsils of Peth and Surgana. The concentration index of this group range is below 1500. Rugged topography, steep slope, less ground water level and poor quality soils are factors for the formation and development of this type of settlements.

Table No.1.Nashik District: Types of Settlement-2011
(Based on Bernards Method of degree of concentration)

Sr. No.	Tahsil	Area (Sq.k.m.)	No. of Villages	Number of Household	N	Index (K)	Types
1	Peth	572.98	145	24119	21025	657	D
2	Surgana	843.75	190	36261	36100	848	D
3	Trimbak	886.67	125	28144	15625	1597	SS
4	Nandgaon	1082.04	100	35991	10000	3894	SC
5	Kalwan	874.81	152	40072	23104	1517	SS
6	Yeola	1051.68	124	44501	15376	3044	SC
7	Igatpuri	817.49	117	34899	13689	2084	SS
8	Chandwad	925.3	111	40195	12321	3019	SC
9	Sinnar	1360.89	129	53047	16641	4338	SC
10	Dindori	1400.25	157	58271	24649	3310	SC
11	Baglan	1479.28	169	65572	28561	3396	SC
12	Malegaon	1794.07	143	73624	20449	6459	C
13	Deola	569.5	50	28865	2500	6575	C
14	Nashik	559.67	73	32772	5329	3442	SC
15	Niphad	1041.89	134	80977	17956	4699	C

(Source: Computed by Researcher with help of Census Data 2011
Note: C- Compact, SC-Semi Compact, SP-Semi Sprinkled & D-Dispersed)

These settlements are small in size and scattered in the areas of forest and hilly areas. These settlements have less connectivity due to rugged topography. Especially the eastern part of Peth and Surgana tahsil has occupied by these types of settlement. In this region the houses are far from one another and the hamlets and villages are small. The maximum part is tribal therefore the primary economic activities such as agriculture, animal husbandry are dominated in these settlements.

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Table No.2. Nashik District: Types of Settlement-2011
(Based on Bernards Method of degree of concentration)

Sr. No.	Types of Settlement	Range (Index)	Tahsil	Total No. of Settlement	Total area (%)
1	Compact (C)	4500 <	Niphad, Malegaon, Deola	335	9.28
2	Semi Compact (SC)	3000-4500	Nashik , Chandwad, Sinnar, Dindori, Baglan, Yeola & Nandgaon	394	16.90
3	Semi Sprinkled (SP)	1500-3000	Igatpuri, Trimbak & Kalwan	863	51.50
4	Dispersed (D)	0- 1500	Peth & Surgana	327	22.32

(Source: Computed by Researcher, 2021)

Semi Sprinkled Settlements:

These settlements are small in size and they are located near cultivable land. The concentration value ranges from 1500 to 3000. The distribution of this type of settlement mainly occurs in Igatpuri, Trimbak & Kalwan talukas of the study area. In Kalwan tahsil these types of settlements are mainly observed near cultivable land. Major characteristics of these settlements are they are small in size and separate individual habitations spreading over the entire region with poor quality and less connectivity of roads. In case of Trimbak and Igatpuri tahsils, this types of settlements are mainly observed in central part of these both tahsils.
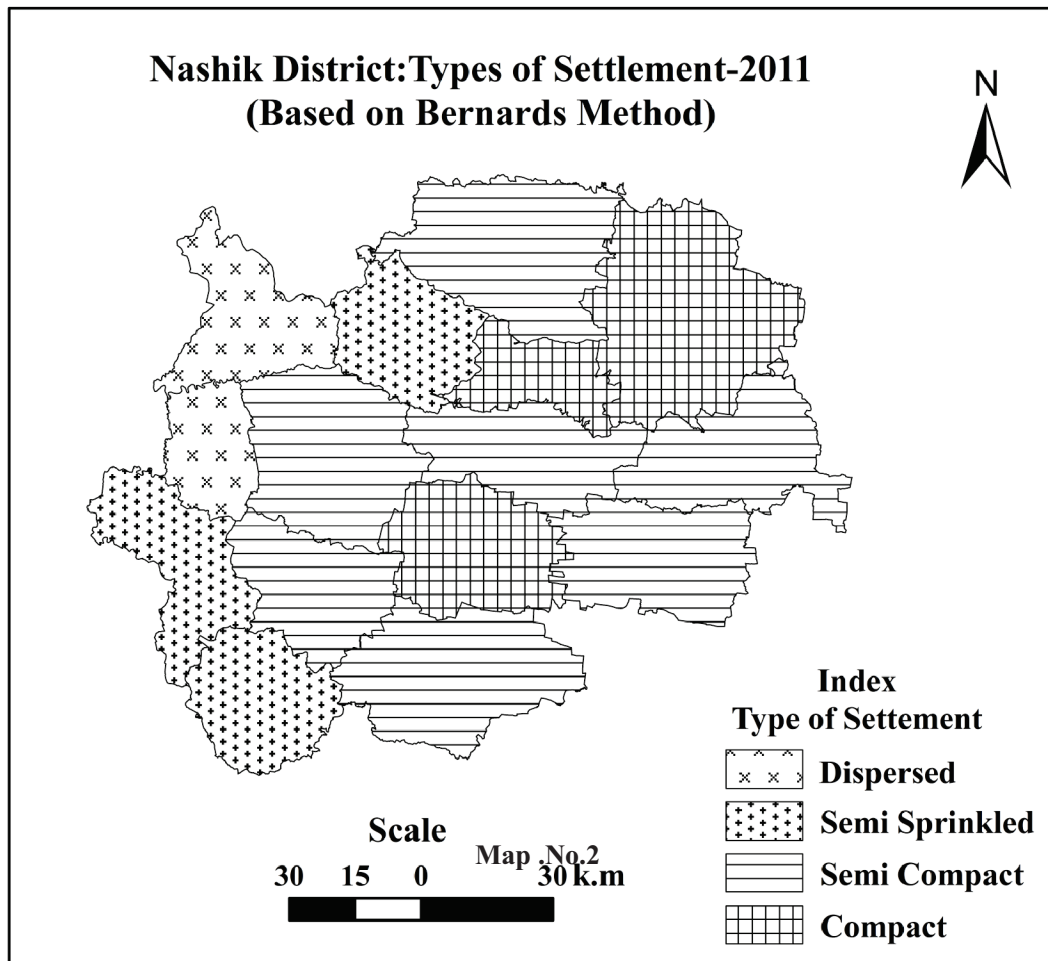
Semi Compact Settlement:

The semi-compact settlements represent an intermediate type between compact and hamleted settlements. The dwellings in such settlements are not very closely knitted and are huddled together at one common site (Mondal and Roy, 2020). Such settlements are characterized by a small but compact nuclears around which hamlets are dispersed. The distribution of this type of settlements are mainly occurred in Nashik, Chandwad, Sinnar, Dindori, Baglan, Yeola and Nandgaon talukas of the study area. In case of Nashik, Sinner and Dindori tahsils, industrial development is the main cause that support to development of semi-compact settlement near the major city area. Most of industrial workers are settled in these settlements. In case of Chandwad, Baglan, Yeola and Nandgaon, the introduction of transportation and communication facilities and starting agricultural development encouraged the growth of these settlements. The concentration values ranges from 3000 to 4500.

Compact Settlements:

The main concentration of compact settlement is found in Niphad, Malegaon and Deola talukas of the study area. Most of the settlements located in these tahasils those have dense population and close spacing between the houses. The concentration values in this settlement range above 4500. These settlements are also known as nucleated or clustered settlements. Generally in nucleated settlements houses are constructed very close to each other and roads are very narrow. Compact rural settlement is the product of permanent agriculture, productive land and favorable climatic conditions (Patil, 2019). Niphad tahsil is well developed in agriculture due to fertile black soil and availability of good irrigation facility. Transportation facilities and agro-based industries are also well developed in this tahsil that encouraged the growth of compact settlement in this tahasil. In case of Deola tahsil due

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to favourable condition for agriculture and development of irrigation facilities are major factors for development of these settlements. In case of Malegaon tahsils rapidly growing population is main cause of formation of these types of settlements. Most settlements of these types are located very close to Malegaon city.

Nashik District:Types of Settlement-2011 (Based on Bernards Method)

N

Index
Type of Settement

x x x	**Dispersed**
(dotted)	**Semi Sprinkled**
(horizontal lines)	**Semi Compact**
(grid)	**Compact**

Scale

Map .No.2

30   15   0   30 k.m

Conclusions:

The overall analysis of the research work indicates the physiographical impact can be seen on the growth of the settlements in the study area. There are four types of settlements are observed in the study area. It includes dispersed settlement, semi-sprinkled settlements, semi-compact settlement and compact settlement. The Degree of concentration (Bernard, 1931) is calculated for each tahsil indicates that there is relatively high concentration of settlements in the Niphad, Malegaon and Deola tahsils due to availability of fertile black soil and availability of good irrigation facility. The most part of these region is occupied by the Godavari and Tapi River. The index of concentration is low for the hilly tahsils of western part such as Peth and Surgana due to unfavourable physical conditions like hilly region and rugged topography. The index of concentration is moderate in Nashik, Chandwad, Sinnar, Dindori, Baglan, Yeola & Nandgaon Igatpuri, Trimbak & Kalwan tahsils of the study area.

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