

An Appraisal of Spatial Organization of Settlements in Upper Kosi Watershed of Kumaon Himalaya, Uttarakhand

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Abstract

The central place theory, postulated by W. Christaller, concerned with the way the settlements evolve and are spaced out which is a theoretical account of the size and distribution of settlements within a system in which marketing (Service Center) is the predominant function. The term settlement has been defined as any form of human habitation, usually implying more than one house. The term 'spatial organization' the fundamental concept is used in a broad sense. It means organization of space or interrelated locations of things and activities. The present paper examines spatial organization of settlements in Upper Kosi Watershed of Kumaon Himalaya.

Keywords: Settlements, Central place, Spatial organization, Service centers.

Introduction

Settlement system refers to the combined set of various occupancy units acting upon and being acted upon a given space, to provide a basic frame of stabilization to the man and his activities (Bennett and Chorley, 1978). Settlements are the most visible features in the cultural landscape representing an organized colony of human beings including the buildings in which they live or work or store or use them otherwise, and the tracks and streets over which their movements take place (Singh, 1962). The unit of settlement is the individual farm, the village, the town, the city or the conurbation, there is plenty of variety in its spatial setting, it is control to human geography, modifying as it does the natural environment by intruding a cultural element (Hudson, 1976).

Organization of the environment of an individual and a society objectively exists since the dawn of the mankind. Theoretical and practical issues of the spatial organization of the settlement system were studied in relation to agricultural production (von Thune's Model), industrial locations and resource distributions (Weber's Model) or commerce and services (Reilly and Christaller's Models). Eventually the phenomenon of the spatial organization freed itself from the primarily

economic platform and moved towards the social and cultural issues (Hagerstrand, 1970). A spatial dimension is thus comprised in the human behavior which changes faster than classic economic processes.

Objective

Present paper aim to appraise Spatial Organization of Settlements in Upper Kosi Watershed of Kumaon Himalaya.

Database and Methodology

The present study is based on primary as well as secondary data. Primary data have collected through intensive field survey. The population data were taken from census reports from 1991 to 2011.

The Study Area

The Upper Kosi watershed is situated in Almora district and extending from 29° 33' 10"N to 29° 52' 25" N and 79° 30' 28"E to 79° 44' 55" E covering an area of 462.81 km². The whole region is mountainous with successive mountain range and river valley. The altitude varies between 1,000 m to 2,750 m above mean sea level. In the north, the study area is separated by Birrachuwakot

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Dhar mountain from the Gomti river basin. This range is higher in the northwestern part i.e. above 2520 meters in elevation, and acts as the source of the Kosi river. Towards the north east, the demarcation range includes the upper parts of the Kausani reserved forest and follows 1800 meters contour approximately up to Jogi patal and finally joins Binasar (2050 mts). It is bordered

in the west by Ranikhet tehsil, in the south by the Nanital district, in the east by the Lamgada block of district Almora and in the north by Garun town of Bageshwar district (Fig. 1). There are two development blocks in the watershed Hawalbagh and Takula covering 234 revenue villages and a small north – west part of Almora city.

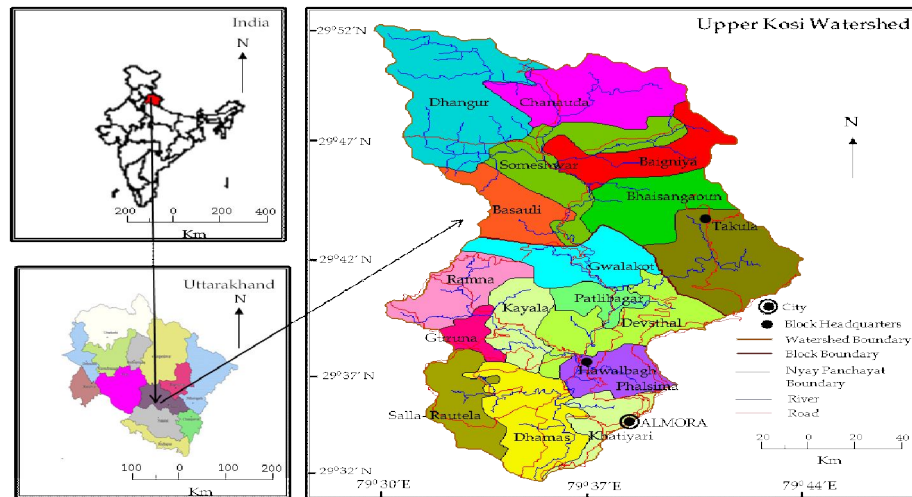


Fig. 1

Population Distribution

Mountainous areas present a unique and characteristic environment for the distribution of population that is conditioned by a variety of geographical factors. The first and foremost is the climate, availability of water and dominance of slope always assert a strong influence on population distribution. Many such factors combined with local geographic characteristics have asserted a strong influence on the population distribution of Upper Kosi watershed that have given rise to distinct pattern and arrangements of settlements. In mountainous region, the principal determinants of population concentration are slope and altitude, interestingly the condition of the slope influences the activity of human beings sometimes greater than altitude. The distribution of population in the mountain is highly irregular and without apparent order. Hence the concentration are mostly found along valleys, the uplands are predominating in slopes may sometimes even be too cold for agriculture or human existence. This largely explains why the density figures along the Trans Himalaya and the greater Himalayan zone are the

lowest i.e. Munsyari, Dharchula, Kapkot and moderately high along areas of less steeper slopes, lower altitudes and moderate climatic zone of the lesser Himalaya i.e. Bhimtal and Dwarahat of Kumaun Himalaya.

The distribution of population in the study area is widely varied due to innumerable geographical conditions like terrain, climatic conditions, availability of water, fuel, fodder and socio-economic factors. Each imprints upon the mosaic of the population distribution in the study area. Guruna (1627), Kayala (1730), Patlibagar (2098) and Bagniya (2690) are the most sparsely populated *nyay panchayats* of the study area, while Khatiyari (10934), Dhamas (8594), Basauli (7490), Chanauda (7024) and Someshwar (5835) are moderately populated *nyay panchayats* of the area (Table 2). Khatiyari and Dhamas *nyay panchayats* are moderately populated as they are situated near the Almora city and enjoy the locational benefit in order to fulfill their needs. Basauli, Someshwar and Chanauda *nyay panchayats* are situated in the Someshwar valley with moderate population and good agricultural area. Thus, the concentration of population

in the entire watershed is mostly along the Kosi river and it decreases in both the directions upwards from the river (Fig. 2). This also hampers the agricultural pursuits hence the *nyay panchayats* in close proximity

of the river wherein the agricultural potential are good in comparison to more populated than those lying at higher altitudes. The remaining *nyay panchayats* of the region are sparse to moderately populated.

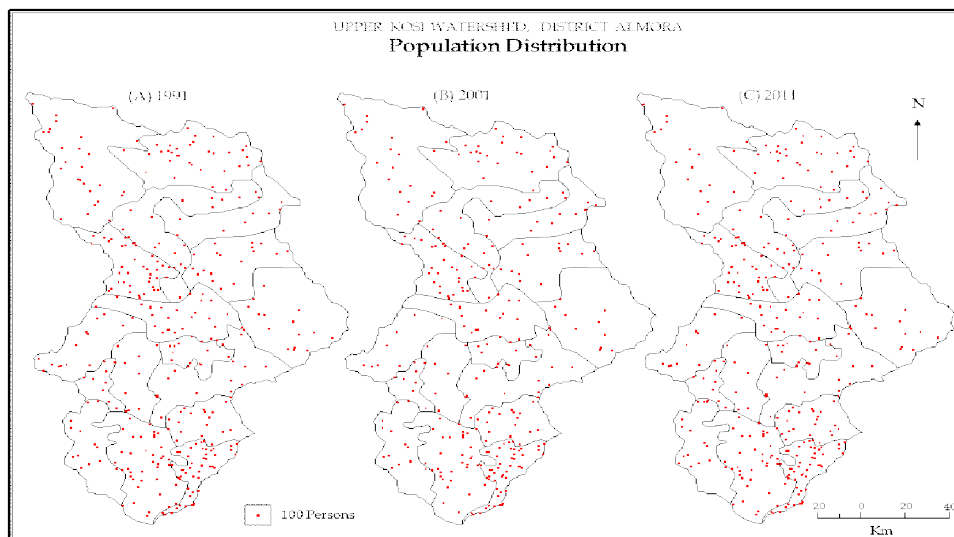


Fig. 2

Table 2: Upper Kosi Watershed, Population Distribution, 1991 - 2011

Nyay Panchayat	Population					
	1991	%	2001	%	2011	%
Baigniya	1546	(2.14)	2968	(3.52)	2690	(3.44)
Basauli	7705	(10.68)	7647	(9.07)	7490	(9.57)
Bhaisangaoun	3619	(5.02)	3834	(4.55)	3410	(4.36)
Chanauda	6336	(8.78)	6565	(7.79)	7024	(8.97)
Dhaungar	5281	(7.32)	5476	(6.50)	3844	(4.91)
Someshwar	4416	(6.12)	5747	(6.82)	5835	(7.45)
Takula	2894	(4.01)	2968	(3.52)	2922	(3.73)
Devsthal	3384	(4.69)	4071	(4.83)	3588	(4.58)
Dhamas	8147	(11.30)	9306	(11.04)	8594	(10.98)
Guruna	1462	(2.03)	1657	(1.97)	1627	(2.08)
Gwalakot	5372	(7.45)	5202	(6.17)	5004	(6.39)
Kayala	1811	(2.51)	1813	(2.15)	1730	(2.21)
Khatiyari	9088	(12.60)	13255	(15.72)	10934	(13.97)
Patlibagar	1917	(2.66)	2219	(2.63)	2098	(2.68)
Phalsima	3266	(4.53)	4772	(5.66)	4915	(6.28)
Ramna	3251	(4.51)	3177	(3.77)	2963	(3.78)
Salla-Rautela	2633	(3.65)	3630	(4.31)	3624	(4.63)
Total	72128		84307		78292	
					218.28	

Source: Calculated as per census of India, PCA, 1991, 2001 and 2011

The availability of land resources and its utilization pattern has a direct bearing upon the distribution of population in the study area. Consequently, a maximum concentration of population is found near the arable lowlands in the proximity of the Kosi river. Socio-economic factors like education, health facilities, and market centers have also lured population to concentrate in certain pockets in the study area. Bio-physical elements like availability of forest resources, pasture land and sources of water have also played their part in the same. There is an inverse relationship between land area and population distribution in the study area.

Occupational Structure

The occupational classification of population generally refers to different branches of activity based on the type of establishment, product made or service rendered.

In order to overcome the difficulties in comparing the detailed information in this respect, it is customary to categorize it into three principal occupational groups or sectors for the purpose of analysis (Clarke, 1966) i.e. the primary sector which directly dependent on land comprising the cultivators and the agricultural laborers, the second group made up of population engaged in different occupation where the common denomination is the production of material goods and the tertiary sector that provides various services for the population such as trade, commerce and transport etc. The occupational structure of a region exhibits the relationship between the economic system of a region and the constituent sectors of economy thereby highlighting the social attributes of a given individual or a group.

Table 3: Upper Kosi Watershed, Occupational Structure, 2011

<i>Nyay Panchyat</i>	Total Worker	Main Workers		Marginal Workers		Non Workers	
		Number	%	Number	%	Number	%
Baigniya	994	853	85.81	141	14.19	1696	63.05
Basauli	3133	1503	47.97	1630	52.03	4357	58.17
Bhaisan gaoun	1526	631	41.35	895	58.65	1884	55.25
Chanauda	3254	1839	56.52	1415	43.48	3770	53.67
Dhaungar	1980	595	30.05	1385	69.95	1864	48.49
Someshwar	2641	1713	64.86	928	35.14	3194	54.74
Takula	1225	405	33.06	820	66.94	1697	58.08
Devsthal	1454	1301	89.48	153	10.52	2134	59.48
Dhamas	3739	1858	49.69	1881	50.31	4855	56.49
Guruna	809	354	43.76	455	56.24	818	50.28
Gwalakot	2534	993	39.19	1541	60.81	2470	49.36
Kayala	888	671	75.56	217	24.44	842	48.67
Khatiyari	3767	2605	69.15	1162	30.85	7176	65.63
Patlibagar	993	331	33.33	662	66.67	1105	52.67
Phalsima	1764	1283	72.73	481	27.27	3151	64.11
Ramna	1257	881	70.09	376	29.91	1706	57.58
Salla-Rautela	1610	759	47.14	851	52.86	2014	55.57
Total	33568	18575	55.34	14993	44.66	44733	55.96

Source: Calculated as per Census of India, PCA, 2011

Table 3 exhibits the salient characteristics of the occupational structure in the Upper Kosi watershed. It is evident from the table that more than half (55.96 %) of the total population of the study area are non workers while only 44.04 percent are total workers in which 55.34 per cent are main and 44.7 per cent are marginal workers respectively.

Types of Settlement in Upper Kosi Watershed

Rural settlements are the significant components to cultural landscape reflecting the reciprocal relationship of human dwelling and physico-cultural environment. Doxiadis (1968) opines that the relationship between settlements within space is reflected in the types of settlements thus the interrelationship between

individual houses in their locational or spatial arrangements determines the type and nature of settlements. It is the manifestation of human enterprise, not being determined necessarily by conditions of physical geography alone. In fact, the type of settlement is a conscious human response to rather than an actual physiographic control by a number of changes resulting from the changing social, economic, political and legal conditions (Dickinson, 1946) in the region.

The various types of settlement observed in Upper Kosi watershed. The complexity arising out of the varying influences of natural and socio-economic conditions under different natural environments necessitates analysis based on different geographic regions. It is very often noticed that similar cultural factors, operating under different environmental influences give rise to different types of settlement. Similarly under an identical physical background, the forces of dissimilar social behavior and socio-economic set up may result into different forms of settlement, thus owing to such diversities to no single part of the region a particular type of settlement is confined. In upper Kosi watershed an innumerable variety of settlements are found, which can broadly be grouped as fragmented, isolated dwellings, loosely compact, partially agglomerated, the crossroad and street village.

Spatial Organization of Settlements

The village settlements generally occupy the lower slopes and fall below the roads for obvious reasons such as drinking water sources and sheltered space against strong winds. As such, the village settlements generally situated away from the roads. It is very seldom that the roads pass through the village settlements. New centers appear at the transport nodes that provide access to the villages, and often at places where there is no habitation. However, the social facilities such as schools, health centers, post offices etc. continue to remain in the villages. These new centers, however, over time may attract private sector services such as medical practitioners, bank branches, etc. During the 1960s the entire region witnessed development in the form of construction of motorable roads by the border road organization (BRO) in the wake of Chinese invasion on the country. The pre 1960s central place system had evolved mostly along the bridle patches. Mules used

to be the main means of transportation of goods and most passenger traffic followed the manual mode. Kathgodam used to be the main wholesale center for day today goods as Kathgodam was developed by the British wherein wooden sleepers were made for construction of rail tracks. Almora too was developing but rather as the summer resting place for British supervisors. People from the study area had to travel for 2-3 days to reach the said destinations to procure the daily needs like salt, *gur*, tobacco and some food grains in exchange of ropes, chillies and other utilities made by the populace. Talking strictly in terms of the study area particularly, as the motor road alignment followed a different alignment, than the hitherto popular bridle path, the centers along it, such as *Panva Naula* some of them revived in the later years only if they came to be linked with feeder roads. It can also be observed that where the new road alignment closes to an existing center, the settlement itself shifted at the road point. It is most important to note that connectivity in the current context with the motor road network rather than the distance generally determines the spatial behavior pattern in the study area and region. An established spatial behavior pattern may abruptly change with the opening of a new road link with the extension of the road link beyond another development, some of the villagers, especially those who have some members in better paid services have also constructed residential houses along the motor roads and thus settlement pattern itself has undergone remarkable change.

Though the spatial organization of settlement system is likely to stabilize in the future with the completion of the feasible transport network, for the present it has to be accepted that the system is dynamically changing. In this connection it has to be noted that in the hills the construction of one small stretch of feeder or rapid link may change the established spatial behavior pattern in the micro region. Another salient aspect of the central places to be considered for planning purpose is that since the motor roads are laid away from the village settlements and new central point's emerge at hitherto uninhabited places, these have no separate revenue classification and for census and any other social accounting would be considered as part of the revenue village in which it falls. However, most frequently the

centers have emerged at point where the boundaries of two or more revenue villages meet. Thus, these factors or dual or multiple revenue jurisdiction has obvious limitations for the development of these service centers and this has become an impediment to their growth and functional efficiency. They have invariably grown in a haphazard way and frequently lack in basic amenities/social facilities, usually administered by the panchayati raj institutions. Lack of independent settlement status of such centers also implies that they do not figure in social accounting and the informational basis needed for planning is completely lacking. The revenue laws should be flexible enough to notify these places as separate or independent settlements and demarcate their boundaries. Unless the significance of the issue is recognized, it may prove to be a major impediment to the growth of small towns and urban centers in the region.

The other concomitant feature of the central places is that they may have much smaller resident population than their dependant settlements. It was also observed that the population fluctuated between day and night and even the day long population fluctuated during different seasons. The shopping and service establishments often close in late afternoon as the owners or managers return to their homes in the nearby villages. As such, the concept of population threshold is found generally inapplicable determining their centrality. In view of these a systematic study of the central place system and hierarchical ordering of service settlements in the study area presented an act of methodological problems. The spatial behavior patterns were constructed on the basis of extensive field study and interviews with the local people. The study area is not a self contained unit and their settlements have interactions with centers outside the watershed area. The central places are basically transportation nodes and market places with retail shops, small service functions like extension services and social facilities. The study area clearly depicts ridge and lower patterns of spatial organization of settlements. The ridge pattern dominates the lower pattern as in hill region; it is difficult to carry goods from lower part to the upper reaches. Therefore, the population prefers to choose market located on the ridge because it is easy to come down with goods.

Marketing Facility

On the name of good market facility, there are only few small markets in the town areas. The villages of area solely depend on local market for their daily needs. However, these local markets cannot fulfill the total requirement of the region and the condition of interior villages are still not good as they have to travel a long distance in order to fulfill of their daily need. In villages, limited options are available for grocery items and the cost is too high, even some times they paid more than MRP. The shops and small-scale industrial unit establishments are located mainly either in the large sized settlements or in the roadside villages. The tailoring, earthenware/pottery making, carpentry and hair cutting are persuading by lower caste as their traditional and family professions. The conditions of medical stores facility are also not good in the region.

There are few small-scale units like flour and oil mills exist in the area in market centers. The items like seeds, fertilizers, insecticides and pesticides are available at the block headquarters or through village level workers. Due to lack of marketing facilities barter system are still prevailing particularly in the remote and inaccessible parts of the settlements of the watershed. Onion and potato are the major items of transaction among the vegetables such as ginger, chillies, radish, pumpkin and turmeric. Among the pulses, soyabean, lentils, gohat and blackgram account for larger share of transactions while the transaction of wheat and paddy is limited. Only limited transaction of paddy and wheat are seen in between villagers. Due to lack of good business the main retailers and wholesalers migrate to Almora and other urban area. In Upper Kosi watershed, there is a good potential for market development but its need proper planning.

Conclusion

It may be concluded that a peculiar feature of the spatial organization of the upper Kosi watershed is vertical. Transportation to cater to the needs of the ever growing traffic of the migrants, to the plains and inflow of the market goods is by far the most important function of the centers. What would be called a developed village is the one where the income from remittances and the consumption level are on the higher side. This naturally poses a challenge for evolving a spatial model for holistic

development and planning of settlements particularly in the Upper Kosi watershed of Kumaon Himalaya, Uttarakhand.

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