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## RESEARCH ARTICLE

### LAND USE CHANGE DETECTION OF SOPORE TOWAN DISTRICT BARAMULLA JAMMU & KASHMIR

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#### ABSTRACT

The world 'land' includes all the characteristics and qualities of the earth. Land may take many physical forms, plains, swamps, hills, mountains and valleys. It may have many kinds of vegetation such as forests, Prairie or tundra, and it may have anion of many kinds of climate, from hot to cold, from humid to arid with any inclusive ideas, especially one which has population as well as professional use. Land obviously means different things to different people. The above prints reveal the fact, that urban centre's are growing by leaps of bounds both at global as national levels making the study of urban areas an increasingly important branch of geography. Besides population, the most important aspects of this branch of discipline are the sites on which the urban population is concerned i.e. the land in urban areas and its various uses. Land use is the use of the land by man while as land cover relates the type of feature presents on the surface of earth. Both these terms are used simultaneously for planning of management activities. The wetland of the Town is changing very fast residential use. People are cutting the trees of their own and the government to make the space for the illegal constructions. Although new roads are being constructed at a large scale but due to the carelessness of the government and the concerned authorities a good amount of land, proposed for road construction has been put under the residential and commercial use by the people. The density of the settlements is inclining very fast, which is changing the main town areas into the slums. Negligible land areas. In short, we the land use has undergone a great change due to which the morphology of the town has been changed from mono-centric to the poly centric region. Urban land use change is an inevitable phenomenon as it is a part and parcel of the overall dynamics of urbanization. Although land use changes cannot be avoided, yet its directions can be regulated in a controlled manner. The control over land use changes are essential as otherwise it leads to a haphazard and unplanned growth of cities and towns. This control can be achieved by planning of land use.

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## INTRODUCTION

Currently there is a global trend towards rapid urbanization. In many parts of the world cities are expanding in size and relative importance due to rapid increase in urban population. This rapid growth of urban population has been due to many reasons. One of the chief causes has been the continuous inflow of rural population in to urban areas either due to some push factors present in rural areas, such as improved agriculture combined with increased pressure of population on land and the consequent release of surplus population or due to pull factors working in urban areas, such as, industrialization

attracting potential rural emigrants to the cities. Besides, towns and cities exert attracting due to employment opportunities, availability of improved social facilities, better medical care and higher education. During last two centuries there has been a worldwide increased both in total towns and in the population of individual towns. During 1850-1900 the world population increased by 37.3% while urban population increased by 193.50% and between 1900-1950 the world population increased by 49.3% while urban population grew by 239% during the same period. This rate of growth shows that by the turn of 20<sup>th</sup> century, 3200 million i.e. half of the world population will live in cities. (karl, 1991)<sup>1</sup> So far as India is concerned, it does not lag behind other countries in respect of urbanization. The total number of people living in urban area according to the 1971 was about 107 million of this number has

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since doubled itself in just 20 years. The total urban population as well as the population number of metropolitan cities (cities in a population of 1000000 or more) in the country in 1971 was 9. It grew 12 in 1981, 23 in 1991, 35 in 2001 and 53 in 2011. The increase in urban population between 1901 and 2011 amounts to 259.6 million a tenfold increase.

### Land use pattern

The world 'land' includes all the characteristics and qualities of the earth. Land may take many physical forms, plains, swamps, hills, mountains and valleys. It may have many kinds of vegetation such as forests, Prairie or tundra, and it may have an array of many kinds of climate, from hot to cold, from humid to arid with any inclusive ideas, especially one which has population as well as professional use. Land obviously means different things to different people. Barlowe (1958) shown that the word land has at least seven major meanings. (i) It is space or room of surface, up on which life takes place. (ii) It is nature or natural environment. Including access to sunlight, rainfall of other climate condition. (iii) It is factor of population in economic process, comparable to labor of capital. (iv) It is a consumption good especially consumption process. (v) It is a situation or a location, with respect to markets, geographical features, and other resources of other countries. (vi) It is a property with legal connotation as to right and ownerships of individuals of rights of responsibilities of ownership and sovereignty of Governments. (vii) It is capital in realistic economic sense land use and land cover terms are used simultaneously for planning of management activities associated with a specific piece of land where as earth. Land is used by man in many ways as a source of food. As a place to live as a place to work etc. the uses of land are as many of varied as the whole range of human culture. In nutshell the land is developed in terms of the kinds of anthropogenic activities that occur e.g. agriculture residential area of industries areas etc. Agriculture scientists are of opinion that about 40% of land in the world may consider cultivable under the existing patterns of cultural environmental.

### Urban land use

The above prints reveal the fact, that urban centres are growing by leaps of bounds both at global as national levels making the study of urban areas an increasingly important branch of geography. Besides population, the most important aspects of this branch of discipline are the sites on which the urban population is concerned i.e. the land in urban areas and its various uses. Land use is the use of the land by man while as land cover relates the type of feature presents on the surface of earth. Both these terms are used simultaneously for planning of management activities. Urban land use refers to the utilization of urban land for various human activities. For Blumenfield (1972) urban land use, at its broadens, can be seen as the adoption of utilization of space to accommodate different human activities such as work, travel, sleeping or recreation all of which stem from the concentration of large number of people in urban areas. And all of which required, if not create specific land uses. The study of urban land use, therefore deals mainly with the surface utilization by one or more function or type of uses. Sometimes the use made of land is intensive for example, recreation with fewer users per acre, but put in any case the land is satisfying some need of the urban resilient. The study of urban land use is of considerable significance. The haphazard growth of urban places especially in less developed countries

and the consequent environmental problems has necessitated a planned regulation of growth of the urban places. However, on planning is to be planned. Thus, land use study is a part of parcel of the entire planning process.

### Objectives of the study

(i) To see the changes in land from 1981-2011 in town. (ii) To see the various causes resulting into these land uses. (iii) To see the impact of these land use changes of the physical, social or economic environment. Sopore town being the District Headquarter of Sopore tehsil is rapidly expanding in population and areal extent. But the growth of town has taken place in somewhat haphazard manner, which have given rise to many environment problems. Thus, in order to overcome these problems, the town needs a proper regular of planning of land use.

### Data base and Methodology

So far as the present study is concerned it is mostly based on secondary data. I have collected the data from different sources. But unfortunately the problem is that very little data is available on Sopore town. Most of the data analyzed for the delimitation of the urban land use changes in Sopore town has been collected from "Office of the Chief Town Planner, Srinagar" and "Census Department of India, Deputy Director Office Srinagar." The adoption of the sound methodology in any socio-economic investigation forms a vital part of the study. For any study the methodology is as much important as the availability of data because the data can be utilized in a better way only when the methodology is sound. Here an attempt has been made to describe the difference aspects of methodology adopted in the study under report. The data collection from the different sources has been analyzed in different ways. Tables are made to show the relation between different data. For obtaining the sex ratio and work force, the statistical calculations were performed, the data showing the land use of 1981 and 2001 has been compiled of the result is represented through 'pie' and 'bar' diagrams. Also the land use maps & drawings for the representation of the land use of the town different periods. A detailed survey was also conducted in Hawrah of 1200 land use/land cover maps were prepared V.L.S.P. Rao (1947) made land use of study of Godavari region and referred to the aims objectives and classification of categories of land use of the world land use commission set up the international geographical union. Mohd Shafi (1960) emphasized the need of sample land use survey and carried out land use survey of eastern Uttar Pradesh. Other eminent workers who have carried out land use survey in different parts of country highlighted various aspects of land use planning area. Besides, various other institutions and departments like national Bureau of soil survey. Land use planning, ICAR National land use and water, land development boards etc, are sample surveys of various parts of the country. Now present study deals with the land use/land cover change in Sopore.

### Study Area:- (Jammu and Kashmir)

#### Location

Sopore is a big town of the district Barmullah, location at a distance of 50 km from Srinagar city, in the North-west direction. It is a large town built upon the fertile banks of Jhelum River. Major portion of the town is on the right side of

the Jhelum. Sopore lies at a distance of 12 kms from the wularlake. Sopore has latitude of  $34^{\circ}17'$  and longitude of  $74^{\circ}31'$  and has an average elevation of 1728 units above mean sea level. Sopore is characterized by fertile alluvial soil while is deposited by river Jhelum at the time of floods. The topography of the town is plain and ultimately discharges their water into the river Jhelum. Sopore lies in the heart of tehsil sopore and headquarter of sopore tehsil lies in sopore town. To its north west lies a magnificent beautiful village sedoo. Kupwara lies at a distance of 45 km in North West. To its south west lies the village sof seer, jagir, chak etc. to the west lies Manzbug, Norpora, Rebban etc. to the extreme north lies the Dangerpora village. In the east is Tarzua and in south lies the laland, Amargad etc sopore town consists of a number territories like Arampora in North east Chickknipora in east central, New colony in the north west, Badambagh and Noornagh in west. Batapora is central and Chankhan in south. Sopore town has an area of  $15.03 \text{ km}^2$  in 1981 with a population of 33584, according to 1981 census which grew to 59624 in 2001. Sopore town has a very good market and a bus stop. A Govt. Degree College is there in central sopore. A number of private and public higher secondary's are there in sopore town. A sub health centre is there in sopore town. Sopore town provide retail commercial insurance and banking facilities to the whole area.

### Physical Setting

The district of Baramulla which lies between  $32^{\circ}-55^{\circ}$  to  $35^{\circ}-50^{\circ}$  north latitude and  $73^{\circ}45^{\circ}$  to  $75^{\circ}-20^{\circ}$  east longitude is one of the six districts of the oval shaped Kashmir valley which commanding an average height of 158 kts, but spread on a flat surface is famous throughout the world for its salubrious climate of scenic beauty. During the inter censal period the district has a notable jurisdictional changes. The area of the district which stood at 7458 kms in 1971 census has shrunk now to 4588 kms. This is because in the inter-censal period the old district Baramulla was bifurcated into two districts, a Baramulla comprising tehsils of Bandipora, Sonawari, Sopore, Barmulla, Culmarg and Uri. Sopore is a big town of the district Baramulla located at a distance of 50 kms from Srinagar city, in the North West direction. It is a large town built upon the fertile banks of river Jhelum. Major portion of the town is on the right side of the Jhelum. Sopore lies at a distance of 1728 mts above mean sea level. Sopore is characterized by fertile alluvial soil which is deposited by river Jhelum at the time of floods. The topography of the town is the plan and has no ups and downs. A number of small streams drain the sopore town and ultimately discharge there water into the river Jhelum. Sopore lies in the heart of the tehsil sopore.

### The sopore town-Geographic settings

Geographically the town is not a separate entity and is somewhat identical with rest of the valley and thus forming a part of the whole. Let us have a brief description o the various geographic variables of the town.

### Soil

Sopore town is a plain area formed by the alluvial soil brought by river Jhelum at the time of flood. The alluvial soil consists of recent and old alluvial type. The soil is deep, fertile and fine textured and yellow grayish colored. A number of cereal crops,

pulses and vegetables are grown on the fertile alluvial tracts of town.

### Drainage

In Sopore river Jhelum is the main drainage artery. The river originates from the south of the Kashmir Valley at Verinag spring in Anantnag district. After passing through Pulwama, Srinagar and Wular Lake, it enters the Sopore town from Adipora Nambal in the north east of the town. In the town it passes through Adipora, maharaja, Jamia Qadeen, Khan-Kah and other area of the town. And at the tulibal region it leaves the town and meets with its tributary Pohru at Doabagh. Whole from it continues its journey, to Khandnayar Baramulla town. People residing at the banks of the river utilize its water for various purposes including drinking, washing cooking and irrigational purposes. There are 2 bridges across the river-which is quite fit for all type of the road transportations. The river is main source of the fish for Hanjis of the town. Other drains of the sopore town are town are Zangir Canal are Kreri Khol.

### Climate

Sopore experiences moderate temperature in summer with maximum temperature ranging from  $28^{\circ}\text{c}$  to  $32^{\circ}\text{c}$  and occasionally reaching  $36^{\circ}\text{c}$  and severe cold in winter with temperature ranging from  $-7^{\circ}\text{c}$  to  $1^{\circ}\text{c}$ . It receives precipitation in the form of rain snow with sleet average rainfall is 80.29 cms which is more than average rainfall recorded for the valley as whole. The humidity remains high during the summer month particularly in June, July and August.

### Relief

Sopore town built upon the banks of river Jhelum posse's flat terrain topography, with little or no ups and downs. There areas with some streams draining through Sopore town lies at an altitude of 1728 mtrs above means sea level. The water drains into the river Jhelum on both sides.

### Historical Background

It is the ancient 'Suryapura' founded in the reign of Avanti Verman by his sister Sura on the site of the still more ancient Kambuva, it is connected with Srinagar by the Noru Canal. This was constructed in very early time to avoid the necessity of crossing the dangerous Wular lake through which the main stream of the Jhelum flows. Till the end of the 14<sup>th</sup> century the town did not observe any significant growth. It was the reign of Sultan Sikander that a Shrine named as Khankah-i-Maula was constructed by Mir Syed Ali Hamdani. Initially around the mosque, Sopore town evolved and developed on the left bank of the river Jhelum. For the centuries a number of rulers of the Kashmir valley and has among than asa result of which Sopore town observed great vicissitudes in the development and growth. The town recorded a sluggish growth during the late 9<sup>th</sup> century and early 20<sup>th</sup> century. The town got electricity in 1921 and in 1935 an administrative body of Sopore town area committee was established for management purposes. The steady growth of the town continued up to mid 50's of this century it was after independence that Sopore saw a rapid rise in population and expansion of the town after independence a new bridge about 1.5 miles downstream from the site of old bridge was constructed and agglomeration of administrative

offices brought radical change in the over-all development of the town. The baradari is situated about half a mile north east of the town, in the Suburb of Chinkipora, on the right bank of the river, and to the south-west of the same side of the town, there. There is a government garden called Hari Singh Bagh which contains a well, but the water is said to be bad.

### Education

In Sopore town there are two Govt. Degree Colleges for both boys and Girls, 7 B.Ed colleges, 5 Higher Secondary and 25 high schools, 28 private nursery schools. These educational facilities are not serving the town population but also its hinterland. The lack of post graduate level educational facilities has been removed by the recent establishment of campus of the University of Kashmir. There is only one such institute of Information Technology (I.T.I.) which is insufficient.

### Medical Facilities

The medical facilities are not satisfactory and require appropriate attention. A sub district hospital and a number of small health centers are there. In addition there are two dispensaries and a couple of private nursing homes serving the population of the town as well as other areas of the district. So far as specialized medical facilities and concerned here are completely absurd and the patients thus shifted to Srinagar face a lot of hardships.

### Socio Economic profile:-Population

At the time of declaration of town in 1911, the population of Sopore town was 8514 persons since then it experienced a slow but steady growth till 1981, When it had a population of 33584. Sopore town had an area of 15.03 km<sup>2</sup> in 1981. According to 1991 census the population grew 45751 persons and 59624 in 2001. Now it has increased to 68082 in 2011.

**Table 2. Population growth profile of Sopore Town**

S.No.	Year	Population	Male	Female	S. Ratio
1	1911	8514	4532	3982	897
2	1921	10876	5738	5138	895
3	1931	12355	6571	5785	881
4	1941	14892	7825	7067	903
5	1951	15341	8050	7291	905
6	1961	18594	9998	8496	859
7	1971	26871	14295	12576	879
8	1981	33584	17831	15753	883
9	1991	45751	24322	21429	881
10	2001	59624	31356	28268	901
11	2011	68082	36084	31998	887

### Sex Ratio

Sex ratio is defined as the number of females per thousand males in a given population. Sex ratio of Sopore town in 1911 was 879 which were ceased to 908 in 1931. After 1951 there has been decrease of sex ratio to 881 in 1991. Then sex ratio showed again an increase to 901 to 2011.

### Literacy Rate

Literacy is defined as the ability to read and write. In 1981 rate of the town was 46.03% which was highest in the state (25.67%) and among all the towns including Srinagar city. In 2011 the town recorded a literacy rate of 61.60 which is still

higher than the state level (53.43%) but it has failed to keep pace with the state in terms of improvements in literacy rate.

### Mosques and Shrines

Khanqah Sopore:- the mosque was built by Sultan Sikander Rule of Kashmir (1394 A.D. to 1417 A.D.) at the instance of Mir Syed Mohammad Hamdani (RA), a Muslim missionary from Iraq. The building collapsed as a result of the earthquake of 1984 A.D. it was later rebuilt and repaired from time to time. The mosque attracts large gatherings on Fridays and on the occasion of important religious festivals. It is visited by thousands of people on sixth Zilhaj (12<sup>th</sup> Lunar Month) for the celebration of the death anniversary of Shah Hamdan (RA), a great Muslim saint at whose instance masses embraced in Kashmir.

### Economic Base

Prior to 1961 due to pseudo-urban nature of the town significant proportion (23.5%) of the workers were engaged in primary sector comprised only 8.8% rest 67.7% of workers were engaged in tertiary sector. The economic base of the town, however recorded a remarkable improvement due to significant changes in occupational structure. Primary sector declined to 12.78% secondary sector increased to 21.07% and tertiary sector recorded 66.15 of the total workers. Sopore town is fastly emerging as an important agro industrial centre of west Kashmir Sopore being very rich in horticulture it acts as the major termination centre for export of fruits outside the valley. The major exported items are apple, Walnut and cherry. Sopore town is also known as apple town, because of the orchards that are grown in the town and in the immediate hinterland. A fruit Mandi has been established in connection with the orchard which provides market facilities for the consumption of fruit. Apple production is the backbone of the economy of the town and adjoining areas. The annual production of fruit in Sopore town and tehsil as whole is about 34560 tonnes, which brings revenue of more than 100 crores in the area. Fruit production, its transportation, marketing and selling provides employment to thousands of people of the area.

### Significance

Information on the rate and kind of change in the land resources is essential for the proper planned management and regulations of the use of such resources. The research about the existing land use and trends of change is essential if the nation has to tackle the problem associated with haphazard and uncontrollable growth. Land is the agrarian economy of Kashmir valley. In such economies both the quality and the quantity of land determines the process of development and general wellbeing of the people. Their economic prosperity, by and large depends upon how best its land is being utilized. The study of land use/land cover reveals the rationality of the existing land utilization. It gives us a vivid picture of the limitations imposed by the physical environment, which may be useful in the future land use planning of the region. In order to attain economic self-reliance and self-sufficiency in food grains, every acre of cultivable has to be put to the optimum use. However, in order to achieve this objective. It is of paramount importance to understand the existing land use/land cover record; otherwise the developmental schemes may fail and even may do more harm than good.

## Land Use Pattern in Kashmir Valley

The land use pattern refers to the various uses which a land is put to. The study of land use reveals the rationality of the existing land utilization. It gives a valid picture of the limitations imposed by the physical environment which may be useful in the future land use planning of the region. In order to attain economic self reliance and self-sufficiency in food grains, every acre of cultivable land has to be put to the optimum use. However, in order to achieve this objective. It is of paramount importance land use, otherwise the development schemes may fail and even may to more harm than good. Kashmir valley comprises of a geographical area of about 15,948 sq km's but revenue records are available only for 5,568.80 sq km's. This reporting area (area as per village paper's for which data on land use classification is available) accounts for about 35.0 percent of total geographical area (area which includes both reported and unreported area) of the valley. The rest 65 percent in unreported, being under inaccessible forests, and lofty mountains. (S-Jasbeer-2004) Table 1.1 gives percentage proportion of major land use categories to the total reporting area in 26 Tehsils of the valley. An examination of the table reveals that there is considerable variation in land use pattern in space. For example the proportion of forest land varies from 0.03 percent in Bandipora tehsil to 4.94 percent in Kangan tehsil. Pattan tehsil has no forest land at all. Kashmir valley for a while has 15,098 acres of land under forests which accounts for 1.1% of the reporting area. Most of the tehsils situated in the central part (valley floor) of the valley have low proportion of forest cover.

under land not available for cultivation. Land put to non-agricultural uses (land occupied by buildings rivers, canals etc) accounts for 12.31% of the reporting area. It varies from 0.02 percent in Bijbehara tehsil to 25.10 percent in Srinagar tehsil. Other un-cultivated land excluding fallows: accounts for 15.67 percent of the reporting area and varies considerably from 5.60 percent in Chadura tehsil to 49 percent in Gurez tehsil. Kemah and Uri tehsils have more than 30 percent of their reporting area under this category of land. This category of land occupies the maximum proportion in Chadura (5.6%) budgam (7.9 percent), Beerwa (8%) and Kangan (8.8%) of the total reporting area. Permanent pastures and other grazing lands: Very essential for live stock rearing, occupy 48 thousand hectares or 8.6 percent of the reporting area in the valley Beerwa tehsil has the maximum of 18.07 percent of the total reporting area under pastures and grazing meadows in Bijbehara, Kupwara and Kernah tehsils this land category accounts for over 10 percent of reporting area.

A good proportion of pasture land and meadows and cool climate of the valley provide ample opportunity for the dairying. In fact the government is trying to provide all possible help to rural people for purchasing Hereford, Jersey and Friezian cows and Russian and Australian sheep which are successfully becoming popular throughout the valley. They are more productive in milk, wool and meat and are successfully replacing the low productive local breeds. There is great need for development and proper maintenance of meadows and pastures which may be of great help in reducing our import of milk and meat.

S. No.	Tehsil	Forest	Land not available for cultivation	Other uncultivated and excluding fallows	Fallow land	Net area sown	Area sown more than once	Grass cropped area
1	Phalgam	0.32	24.81	18.46	308	53.33	25.13	78.46
2	Anantnag	0.10	18.52	16.55	2.54	62.29	28.31	90.60
3	Duru	0.39	17.56	17.26	1.20	63.59	16.59	80.81
4	Kulgam	0.72	18.62	15.92	0.51	64.23	9.01	73.24
5	Bijbehra	0.7	10.76	22.16	6.00	61.01	30.3	91.63
6	Shopian	0.85	18.33	16.68	2.58	61.50	14.6 d	76.L''t
7	Pulwama	0.11	11.03	14.88	14.86	56.12	39.16	95.28
8	Pampore	1.89	24.55	12.19	17.07	44.30	17.69	61.99
9	Tral	0.71	20.12	15.52	13.46	50.19	33.5	83.73
10	Ganderbal	3.08	18.87	20.35	5.80	51.90	14.60	66.20
11	Kangan	4.94	24.13	8.80	7.11	55.02	1.14	56.16
12	Srinagar	2.87	27.91	14.70	17.54	36.98	8.37	45.35
13	Chadura	2.78	16.99	5.60	16.65	57.98	27.26	85.24
14	Badgam	2.39	22.37	7.91	10.20	57.13	10.03	67.16
15	Beerwa	0.52	20.95	7.99	3.20	67.34	6.39	73.73
16	Bandipora	0.03	17.14	16.34	1.36	65.13	-	65.13
17	Gurez	0.61	22.65	4900	2.22	25.52	-	25.52
18	Sonawari	2.05	13.84	17.43	1.00	65.68	-	65.62
19	Sopore	0.32	13.44	9.59	0.53	76.12	-	76.12
20	Baramulla	0.19	10.83	11.12	0.70	77.15	1.43	78.58
21	Pattan	-	22.20	11.71	2.78	73.31	-	73.31
22	Gulmarg	0.40	22.06	12.25	0.53	66.76	4.89	71.65
23	Uri	2.95	31.82	38.50	3.12	23.61	-	23.61
24	Handwara	0.93	3.66	17.06	3.21	75.14	2.73	77.87
25	Karnah	0.78	33.62	29.06	0.67	33.87	1.33	35.20
26	Kupwara	0.05	16.32	15.36	0.12	68.15	-	68.15
Total Kashmir Valley		1.10	17.86	15.67	5.59	59.78	12.23	72.01

Source: Financial Commissioner, Srinagar

Land not available for cultivation (all barren and un-cultivable land like mountains, rugged terrains & deserts) varies significantly from 3.66 percent in Handwara tehsil to 35.62% in Kernah tehsil, Srinagar, Kangan, Badgam, Beerwa, Tral, Pampore, Pahalgam, Gulmarg, Uri, and Gurez tehsils have more than 20 percent of the reporting area under this category of land. Kashmir valley has about 18% of the reporting area

Land under miscellaneous tree crops and groves' (This includes land which is under thatching grasses, bamboo bushes and other groves for fuel etc. Which is not included under orchards) not included in the not sown area share 1.5 percent of the reporting area in the valley. It varies from 0.16 percent in Chadura tehsil to 5.06 percent in Sonawari tehsil. Uri and Gurez tehsil have no land under this head.

**Culturable waste:** (the land available for cultivation whether or not taken up for cultivation or taken for cultivation once but not cultivated during the current year and the last five years or more in succession for one or the other reason's. such lands may be either fallow or covered with shrubs, bushes and denuded forest which is not put to any use) occupying 16.91 percent of the reporting area in the valley varies from 1.2 percent in Kangan to 45.47% in Gurez tehsil. Uri has 20.05 percent of its reporting area under Culturable waste land. They can, however, be made profitable by the application of modern technology like tractorisation, providing irrigation facilities and bringing under social forestry.

**Fallow lands:** (This includes all lands which were taken for cultivation but are temporarily out of cultivation for a period of not less than one year and not more than five year's) occupy a total of 75,858 acres of land or 5.6 percent and Kupwara tehsil has the minimum of 0.12 percent of the reporting area under fallows. Fallow lands other than current fallows occupy a meager proportion of 0.61 percent of the reporting area in the valley as a whole. This category of fallow lands has the minimum of 0.08 percent in Shopian and Sonawari tehsils and maximum of 17.140/0 in Srinagar tehsil. The reason for keeping such lands fallow may be one more of the following reason's. (i) Poverty of the cultivation. (ii) Inadequate supply of water (iii) Silting of canals and river's and (iv) Unremunerative nature of farming.

**Current fallow's:** (this represents cropped' area which are kept fallow during the current year) occupy 67,829 acres of land which accounts for 4.98 percent of the total reporting area in the valley current fallows show higher concentration in Pulwama (17.5%) Pampore (16.7%) and Chadura (16.5%) Baramulla, Gulmarg, Karnah and Kupwara tehsils had no current fallows during the reporting time.

**Net Sown area:** (this includes total area sown with crops and orchards, counting area sown more than once a year only once) is 340 thousand acres of land which accounts for 60 percent of the total reporting area in the valley. However it shows a large inter tehsil variation. For example the hilly tehsils of Gurez, Kernah and Uri with rugged topography have only 23.52 percent, 33.87 percent and 32.61% respectively of their reporting area under 'net sown area'. On the other hand Baramulla, Sopore and Handwara tehsils have more than 75 percent of their respective reporting area under this land use category. Elsewhere it ranges from 44.3% in Pampore to 73.3% in Pattan tehsil. However, these are ample chances of increasing the land under this category by making culturable wastes (16.9%) and fallow (5.6 percent) fit for cultivation. It is an obvious thing that grater the area under this head, higher is the agricultural production. This land is thus the real feeder of people. The proportion of area sown more than once (it includes the area on which crops are cultivated more than once during the agricultural year) is, on an average 12.23 percent of the total reporting area in the valley. Since the land under this head is greatly water logging and altitude, significance variation is therefore, noticed from one tehsil to another in respect of area sown more than once a year. For example Pulwama tehsil having better irrigation facilities (over 89% of the net sown area has irrigation facilities available) and comprising of rich alluvial soil with no water logging has more than 39% of the total reporting area under double cropping similarly the tehsils of Bijbehara and Tral, having adequate irrigation facilities available coupled with rich fertile soils have

more than 30% of the reporting area under double cropping. On the other hand, no double cropping is practiced in the tehsils of Bandipore, Gurez Kupwara and Uri. Rough terrain, high altitude and low temperatures (responsible for short maturity period) restrict these tehsils of Sonawari, Sopore and Pattan leave in chance for double cropping. The total 'grass cropped area: (the sum total of area covered by all individual crops, areas sown with crops more than once during the year, being counted as separate areas for each crop) in the valley of Kashmir is 72.01 percent of the total reporting areas. However marked variations do exist in percent gross cropped area from tehsil to tehsil. It is much low in the tehsil to Uri, Gurez and Kernah where it is 23.61 percent 25.52 percent and 35.2 percent respectively in proportion to their total reporting area. It is of higher order in the tehsils of Pulwama (80.2%) elsewhere it ranges from 45.3% in Srinagar tehsil to 78.6% in Baramulla tehsil of their total reporting area.

**Land use changes:** Land changes as we know are the part and parcel of the overall growth of an urban place. As the cities and towns growth, the proportion of land used by different by activities also undergo changes to meet the changed socio-economic and demographic condition. E.g. as the city grows and the population increases the proposition of residential land use decreases and the population of land under other uses generally decreases (Singh 1980). These changes in land use, whenever, depict different trends in different cities.

The study of these changes is essential for the PT. of view of future planning of the particular city or town. Whoever, keeping in view the entire web of several land uses and study of land use change is all most impossible without classifying them into a limited numbers of classes which can be compared at different points of time drawing any solid conclusions. Thus, the urban land use classification is the prerequisite for studying land use changes in an urban place. "Singh J.P: urban land use planning in hill areas, inter India publications, Delhi, 1980." Land use of Sopore town from 1981-2011. Among the two major towns of Baramulla district Sopore town is largest town both in terms of population and area. There has been a phenomenal change in the land of town from 1981-2011 because of tremendous increase in population in respective decades. Rapid industrialization and commercialization has resulted to change in both built up land of agriculture land tremendous growth in population has resulted into the absorption of adjacent lands of hinterland into the town rapid growth of population in Sopore town has been responsible for transportation, corridors of intensive utilization in the inner parts of the town. The existing land use change is an amalgamation of all sorts of land uses of town activities. In view of radical growth in its spatial sprawls in its local area has been enlarged from 693.0 acres in 1981 to 935.27 acres in 2011. Source:- Master plan Sopore town 1975-1995. Comprehensive development plan for Sopore. Town (1993-2011) ULDSSMT, Sopore town 2006.

**Land use Changes (1981-2011):-** During the past three decades Sopore town has witnessed tremendous growth both in terms of population as well as areal extent. The population of the town has grown from 163436 in early 1981 to over 266712 in 2011. A one-one fold increase from 693.0 acres in 1981 to 935.27 acres in 2011.

This tremendous growth of town has led to changes in all types of land uses.

**Table 4.1. Urban land use classification**

(1) Built up area	1. Residential	(i) Private residential (ii) Govt. residential
	2. Commercial	(i) Ware house (ii) Storage industrial
	3. Industrial	(i) Light industrial (ii) Industrial estate (iii) Handicraft centre (iv) Saw mills
	4. Governmental Use	(i) Government offices (ii) Institutions
	5. Recreational	(i) Parks (ii) Playgrounds
	6. Public and semi Public	(i) Educational (ii) Social Culture (iii) Hospital (iv) Veterinary centre
	7. Other community Facilities	(i) Post offices (ii) Telegraph offices (iii) Telephone exchange (iv) Police station (v) Cinema houses (vi) Fire stations
	8. Religious Area	(i) Mosques (ii) Temple (iii) Gurdwaras (iv) Shrines
	9. Public utilities and service work	(i) Electric sub station
	10. Circulation	(i) Roads (ii) Road terminals (iii) Petrol pumps
(2) undeveloped lands	1. Agricultural	(i) Vegetables (ii) Paddy fields
	2. Other uses	(i) Grave yards (ii) Cremation grounds (iii) Barren land
	3. Water bodies	(i) Rivers and Nallas Springs

**Table 4.2. Land use pattern of Sopore town (1981) (Land use structure of built up area of Sopore town 1981)**

S.No.	Land use category	Area in acres	Percentage of total built of land	Percentage of data area of the town
1	Residential	238.6	66	34.43
2	Commercial	13.20	3.65	1.90
3	Industrial	30.2	8.35	4.35
4	Govt. use	3.95	1.09	0.56
5	Recreational	3.50	0.96	0.50
6	Public of semi public	14.14	3.99	2.07
7	Other community	3.24	0.89	0.46
8	Religious area	2.80	0.77	0.40
9	Public utilities of service work	2.70	0.75	0.38
10	Circulation	48.948.900	13.53	7.05
11	Sub total	361.5	100%	52.16
Land use structure of Undeveloped land sopore town 1981				
1	Agricultural	178.2	53.75	25.71
2	Water bodies	57.17	17.24	8.24
3	Other uses	96.13	28.96	13.87
	Sub total	331.5	100%	47.82

Source:- J & K town planning organization, Srinagar Master plane Sopore town. 1975-1995.UIDSSMT, Sopore town-2006

**Table 4.3. Land use structure of Sopore town 1981**

Particular	Area in Acres	%age of total land area
Built up area	361.5	52.16%
Agricultural	178.2	25.71
Water bodies	57.17	8.24
Other uses	96.13	13.87
Grand total	693.0	100%

Source:- J & K town planning organization, Srinagar Master plane Sopore town, 1975-1995 UIDSSMT, Sopore town-2006

**Table 4.4 Land use pattern of Sopore town (2011) Land use structure of built up area Sopore town 2011**

S.No.	Land use Category	Area in acres	Percentage of total built of land	Percentage of data area of the town
1	Residential	420.70	72.42	44.98
2	Commercial	19.90	3.42	2.12
3	Industrial	35.20	6.05	3.79
4	Govt. use	4.60	0.79	0.49
5	Recreational	5.41	0.93	0.57
6	Public of semi public	18.15	3.12	1.94
7	Other community Facilities	6.91	1.18	0.73
8	Religious area	2.9	0.49	0.30
9	Public utilities and service work	4.2	0.74	0.44
10	Circulation	63.10	10.86	6.74
	Sub total	580.87	100.00	62.1
Land use structure of Undeveloped land of Sopore town 2011				
1	Agriculture	210.50	59.39	22.50
2	Water bodies	42.00	11.85	4.49
3	Other uses	101.90	28.75	10.89
	Sub total	354.40	100%	37.88

Diagram above shows have been drawn from the same type of data, land use of the land, for the two given years 1981 and 2011 respectively, So that the changes could be understood very easily.

In the same way the diagram has also been derived same type of data. Land-use structure of built up area for the two different years for the same purpose as above. The urban land-use

change for the town could be now easily understood from the diagrams and the tables, above.

To make the change easily understandable I have drawn a pie diagram from the data of %age of change in the 4 categories of the total area land of the town.

**The change in the urban land use of the Spore town could be discussed as under:-Change in the Built-Up Area:** The total built up area of the town has increased from 361.5 acres in 1981 to 580.87 acres in 2011. That is there was a growth to the built up area of the Sopore town? Because in 1981. 52.16% of land was the built up area of the town, which could had probably gone up to 62.1% in 2011. Because the newly introduced area had a very small %age of land area under the structure or we can say, these areas had very percentage of built up area to the total area of the town. That is why %age of the built up area/developed area which was 52.16% in 1981 could reach to only 62.1% with a growth of only 9.94%. but this 9.94% of growth is the highest growth in all the use of the urban land of Sopore town.

undeveloped area and 693.0 acres of total area of the town there did 178.2 acres under agricultural land use constitute about 53.75 of the undeveloped area and 25.71 of the total area of the town? In 2011 the land used for agricultural purposes have increased to 210.50 acres out of 354.40 acres of the undeveloped land and 935.27 acre of the total area of town which form 59.39 of the undeveloped area and 22.50 of the total area of the town. But this change of 32.3 acres in the land use of agricultural plantation is not growth in the land use of agricultural plantation, because there was emergence of new areas in the town with a land area of 358.57 acres. So this true change of 32.3 acres of land, which were taken under agricultural plantation use, is considered as the negative growth of 3.21%. Therefore new change in the areas of the Sopore town under the agricultural plantation is-3.21.

**Change in the area under water bodies:** In 1981 the total area under water bodies constituted about 17.24 of the undeveloped area and 8.24 of the total area of the town which has decreased to 11.85 of the total undeveloped area and 4.49

**Table 4.5. Land use structure of Sopore town in 2011**

Particular	Area in Acres	%age of total land area
Built up area	580.87	62.1
Agricultural	210.50	22.50
Water bodies	42.00	4.49
Other uses	101.90	10.9
Grand total	935.27	100%

Source:- J & K town planning organization, Srinagar Master plane Sopore town, 1975-1995 UIDSSMT, Sopore town-2006 Net change in land use

**Table 4.6. Total land use change in the Built-up area of Sopore town 1981-2011**

S.No.	Particulars	Area acres in 1981	Area in acres in 2011	Change in land use area 1981-2011	% of total built up land 1981	% age of total built up land 2011	Change in % of total built up land
1	Residential	238.6	420.70	182.21	66	72.42	6.42
2	Commercial	13.20	19.90	6.7	3.65	3.42	-0.23
3	Industrial	30.2	35.20	5	8.35	6.05	-2.3
4	Govt. use	3.95	4.60	0.65	1.09	0.79	-0.3
5	Recreational	3.50	5.41	1.91	0.96	0.93	-0.03
6	Public of semi public	14.41	18.51	3.74	3.99	3.12	.87
7	Other community fail	3.24	6.91	3.67	0.89	1.18	0.29
8	Religious	2.80	2.9	6.1	0.77	0.49	-0.28
9	Public utilities of service work	2.70	4.2	1.5	0.75	0.74	-0.01
10	Circulation	48.90	63.10	14.2	13.53	10.86	-2.67
Total		361.5	580.27	219.37	100%	100%	

**Table 4.7 Total land use change in the undeveloped Land of Sopore town 1981-2011**

S.No.	Particulars	Area acres in 1981	Area in acres in 2011	Change in land use area 1981-2011	% of total built up land 1981	% age of total built up land 2011	Change in % of total built up land
1	Agricultural	178.2	210.50	32.3	53.25	59.39	5.64
2	Water bodies	57.17	42.00	-15.17	17.24	11.85	-5.39
3	Other use	96.13	101.90	5.77	28.96	28.75	-0.21
4	Built up area	33.1.5	354.40	22.90	100%	100%	---

**Table 4.8 Total changes in the urban land use of the total area of the Sopore town**

S.No.	Particulars	Area acres in 1981	Area in acres in 2011	Change in land use area 1981-2011	% of total built up land 1981	% age of total built up land 2011	Change in % of total built up land
1	Built up area	361.5	580.27	219.37	52.16	62.1	9.94%
2	Agricultural plantation	57.17	210.5	32.3	25.71	22.50	-3%
3	Water bodies	57.17	42.00	-15.17	8.24	4.49	-3.75%
4	Other uses	96.13	101.90	5.77	13.87	10.89	-2.98
Total-		693	935.27	-	100%	100%	-

**Change in the area under agricultural plantation:** Agricultural land ranks the five major function of the town. The land area under orchard, paddy and vegetables is known as agricultural plantation. In 1981 out of 331.5 acres of total

of the total area of the town in 2011. Thus the %age area under water bodies to the total undeveloped land declined by -5.39% and the %age of that to the total undeveloped land declined by -5.39% and the % age of that to the total area of the town



declined by 3.75 are considered as the negative growth. Therefore new change in the area of the Sopore town under the water bodies is -75%. Because of the water bodies are put under the product of crops and vegetables.

**Change in the area under other uses:** The land under grave yard, cremation ground, barren land, marshy land etc and taken under one category known as other use. In 1981 the land area of the town under this category of usage was 96.13 acres which was 13.87 of the total land area of the town. But the use/unused of land under which category is reduced to a remarkable extend from 1981-2011. The land and other use was 13.87 in 1981 and reduced to only 10.89 in 2011. That is a decline of 2.98 of the land use. It is a negative as well as a positive change in the land use, because the area of natural vegetation is put under the production of crops and vegetables. The land of Sopore called 'Dhar Nambal' is being cut very fast by the people for firewood and cleaning space for production of vegetables for the personal use. Which causes the inverse impact on the natural end? But this land use change has some progressive faces also, because marshy and barren land is put under the crop. And also marshy land is being improved by the government and is planned to shift the all types the all types of industries in the urban centers to that marshy land.

**Factors Responsible for Land use changes in Sopore:** The most important factors which have resulted into land use changes in Sopore town are population growth and migration. The population of Sopore town has grown tremendously from just 8514 in 1911 to 68082 in 2011. There has been 7 fold increases in population of Sopore town during this 20<sup>th</sup> century. The decadal population growth rate has been greater than 30% on average. This increasing population has resulted into tremendous change in land use. The agricultural land has been brought under constructional use for housing, building of Govt. and private buildings, construction of shopping complexes, school buildings banks, and other semi government buildings. Population growth has resulted into development to slums in some areas of environmental consequences, causing problem for miserable population. Other factors which contributes for the land use change has been the immigration from neighboring areas into the town. The town provides various goods and services particularly the whole sale and retail business, educational facilities, medical facilities, banking and financial facilities etc which has attracted population from the adjacent next neighborhood and hinterland to avail those facilities. Thus the people emigrated from the hinterland, adding additional burden on the already limited natural resources particularly the fertile agricultural land other open spaces which acted as breathing lungs for the whole community. This has resulted into disequilibrium between the population and available land. Sopore town consists of several localities particularly Arampora, Chinkipora, Batapora, Adipur, New Colony, Main Chowk, Down town, Kranshivam etc. ther has been a general increase in land use under residential built up.

The agricultural areas particularly of Arampora, New Colony and Kranshivam have been brought under residential built up for housing purposes. Shopping complexes, banking and financial facilities have increased in main chowk and down town areas. Tehsil head office, police station have grown in the form of B.Ed Colleges and a number of other government and private schools have been established in northern western areas of sopore town particularly New colonies and north of Bus

Adda. Land use and land cover change is perhaps the most prominent form of global environmental change, since it occurs at spatial and temporal scales immediately relevant to our daily existence. The change in land use and cover, especially when coupled with climate change and variability, are likely to affect natural resources and eco system in complex ways. The National Research council recently identified land use dynamics as one of the grand challenges for environmental research. Determining the effect of land use and land cover change depends on an understanding of part land use practices, current land use and land cover patterns, and projections of future land use and land cover, as affected by human institutions. Population size and distribution of economic development, Technology and other characteristics. The combination of climate and land use change may have profound effects on the habitability of the planet in more significant ways then either aching alone. While land use change is often a driver of environmental and climate change, a changing climate can in turn affect land use and land cover. The primary drivers of land use and land cover change are population growth. Technological advances, economic opportunity and public policy. Pattern of human settlement are shaped by both the inter-action of environmental (e.g. climate, geology, topography and vegetation) and social (e.g. cultural custom's and ethnicity) forces around the world.

**Problems of Land use changes in Sopore:** By the term land use we mean the type of human activity or economic function performed on the piece of land. Thus agriculture, horticulture, urbanization, industrialization etc practiced are all examples of land use. From time immemorial Sopore has been regarded as the crown town of whole district Baramulla. It is also known as apple town due to increasing population in the town more and more fertile agricultural land is being used for constructional and build up purposes. To support high population small agricultural holding are being intensively cultivated. This intensive cropping and growing more than one crop a year has resulted into diminishing returns and decrease in soil fertility for this high dose of fertilizers are being put to land to raise the crop output which has resulted into widespread soil and water pollution. Decreasing available land has resulted into growth of slums which adds more ecological footprint on its fragile ecosystem. Decomposition and disposal of wastes along the banks of river Jhelum has affected severely its water quality and has made it unsafe to drink. Open spaces and wide parks have vanished from the scene which once formed the breaking lungs for the town.

## Conclusion

After collection, analysis and interpretation of the data regarding to the LAND-USE change of the Sopore Town, I came to conclusion that the town is not changing in the aspects of Land-Use only. But it has been changing in total land area also. New areas are emerging with every census year of the Town. Due to the development of the Town by the development of the trade and commerce in the Town, people in the hinterland prefer to live in the Town. From last 30 years almost half dozen of B.Ed colleges, a couple Professional colleges and dozens of other schools and higher secondary's have been established. Also a good number of computer Institutions have been opened in the Town. Due to these educational facilities in the Town the literacy rate has been raised to the remarkable level, therefore people shifted from primary sector of economies towards the service sector of the

economies, as the 'FRUIT MANDI' was established in the TOWN the inflow of apple merchants and apple products increased into the Town which leads to the development of roads and transportation, and under these roads a good amounts of agricultural land is changed into the built up area. The wetland of the Town is changing very fast residential use. People are cutting the trees of their own and the government to make the space for the illegal constructions. Although new roads are being constructed at a large scale but due to the carelessness of the government and the concerned authorities a good amount of land, proposed for road construction has been put under the residential and commercial use by the people. The density of the settlements is inclining very fast, which is changing the main town areas into the slums. Negligible land areas. In short, we the land use has undergone a great change due to which the morphology of the town has been changed from mono-centric to the poly centric region. Urban land use change is an inevitable phenomenon as it is a part and parcel of the overall dynamics of urbanization. Although land use changes cannot be avoided, yet its directions can be regulated in a controlled manner. The control over land use changes are essential as otherwise it leads to a haphazard and unplanned growth of cities and towns. This control can be achieved by planning of land use. Thus the urban land use planning forms the basis for planning of cities and towns. The suggestions being proposed for the town are:- (i) Launch new and effective Sewage Treatment Programme. (ii) Stop further construction along the river banks. (iii) Stress should be given to vertical construction of structures to save the agricultural land. (iv) Declare the Dhar Nambal AS Green belt for the Town. (v) Improvement and introduction of recreational land. (vi) Stop Urban sprawls. (vii) Stress more on non-smoking industries.

(viii) Stop the construction of structures in the orchards and wetland as they act as green belt. (ix) Establishment of the Industries should be near the fringe area of the Town. (x) Construction of commercial, residential and industrial structures should be properly planned.

## REFERENCES

- Attaullah, M: Urban Land its Use and Misuse, Amar Prakashan, Delhi, 1985.  
 Comprehensive Development plan for sopore town (1993-2001).  
 District census Handbook, Sopore, 1981.  
 First population totals for J & K, census of India, 2001.  
 Kabul, A. K.: Kashmir Physiography, Gulshan Publishers, 1977.  
 Kar, A.K.: Land Use and Land Value of Srinagar City, Unpublished M.Phil, Thesis, Kashmir University, 1991.  
 Master plan of Sopore Town, 1975-1995.  
 Master plan of sopore town, 2012.  
 Raza, M. Ahmad & Mohammad, The Valley of Kashmir (A Geographical Interpretation) Vikas publishing House PVT. Ltd. New Delhi 1978.  
 Sharma, V.V.: Remote Sensing For Land Resources Planning, Concept Publishing Company New Delhi, 1991.  
 Singh, J.P. 1980. Urban Land Use Planning in Hills Areas, India publications, Delhi, 1980.

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