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Integrated land use planning for sustainable development: a case study

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Abstract
India is considered to among top developing nations of world. India is seventh in the list of countries in terms of geographical area and second in the list in terms of population. India`s geographical area ranges from mighty mountains of Himalayas to tropical areas in the south. Due to random use of land in an unplanned manner in country for infrastructure development caused rapid transformation of cities, districts and villages, which has at large scale affected sustainability of country. Although some cities are sustainable and well planned. Sustainable development means wise use of natural resources for socio economic development taking into consideration the needs of future generation. This study had been done on Srinagar city of state Jammu and Kashmir of India on subject of unplanned land use and its effects on sustainability of city. This study provides the policies to tackle the situation of city. In this context the paper presents an overall understanding of the land management paradigm for sustainable development in Srinagar, Jammu and Kashmir.

Key words: integration, land use planning, sustainable development

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I. INTRODUCTION

The management of land and its use has long been the subject theme of city planners throughout the globe. As cities area unit is growing in dimension and size, the sources of built-up land area unit are decreasing hastily. This thought of land as a scare reserve has prompted the concept of sustainable property to planners across the world and to introduce the concept in their discipline in an endeavour to higher have room for the requirements future population and current population as well. The notion of development‖ can be associated to the science of rural planning and urban planning within the perspective of this research in the logic that planning and development is concerned with all the activities that are occurring on land both current and future as well. Sustainability and Planning both have a chronological dimension. sustainability refers to what we tend to do currently,

In several instances, however, the activities of land use designing don't seem to be integrated. This ends up in inefficient cities and cities that at a pace developing in an exceedingly financially unsustainable manner. Land may be a restricted resource and nevertheless an imperative resource for meeting the social, economic and environmental demands and targets. The mounting development allied by the rising population and so the associated industrial enterprise and urbanization land resource is raising pressure on it.

II. A CASE STUDY OF JAMMU AND KASHMIR

2.1 Jammu And Kashmir

The Jammu and Kashmir geographical region state is largest Mountain State of India and also the Northern most state. Situated between thirty-two.17 degrees and thirty-six.58 degrees north latitude and thirty-seven.26 degrees and eighty.30 degrees east meridian. According to geologists, Kashmir Zone falls in Seismic Zone 5, extremely vulnerable to strong earthquakes. The state of Jammu and Kashmir is an agrarian economy predominantly with about 80% of its population linked to agriculture and associated sectors. Land being one of the basic natural resources has always been the subject matter of debate regarding its effective use. One of the most important problems being dealt with by the state is the conversion of land mainly land from agriculture to non-agricultural purposes due to urbanization and other activities. As per Agriculture figures, 2 hundred thousand canals of agriculture land of world wide web planted or cultivated space of 3 and a 0.5 hundred thousand square measure has been reborn for industrial and alternative functions in Kashmir over the years. As per the economic survey, 2011, J&K state has been listed as a food deficit state, therefore, agriculture land conversion especially that of paddy fields is a serious issue.

2.2 OBJECTIVES

1. To determine the causes of change of Land cover of city and its effects on sustainability.
2. To determine the strategic approach and comprehensive planning method for sustainable infrastructure development.
3. To determine the challenges for integrated land use planning for sustainable infrastructure development.

III. ANALYSIS AND INTERPRETATION

3.1 City profile (Study Area)

Srinagar town is that the largest metropolis within the whole range region and not solely in Jammu and Kashmir geographical area. Town has been alarmingly growing at abundant quicker pace so indicating in its goodly changes. The city dal lake is settled within the city heart of Srinagar town. Town of Srinagar receives the majority of its rainfall right the way through the winter and has a Mediterranean sort of weather. According to a latest census, Srinagar city has a population of 1.1 million. Srinagar has been listed the tenth worst contaminated town within the world in step with World Health Organisation ‘s (WHO ‘s) international urban pollution information. Kashmiris, especially those living in Srinagar, are annoyed about this development. The process of urbanization has modified extensively the land utilization of Srinagar town and the area in its surrounding. Unrestrained, speedy and Unplanned urbanization causes jumbled growth. The models of urban growth are varying natural scenes and dynamics of these natural landscapes. In a most important drive for development the of urban infrastructure in state of Jammu and Kashmir, the twin capitals of state Jammu and Srinagar have been in the list of smart cities to be developed.

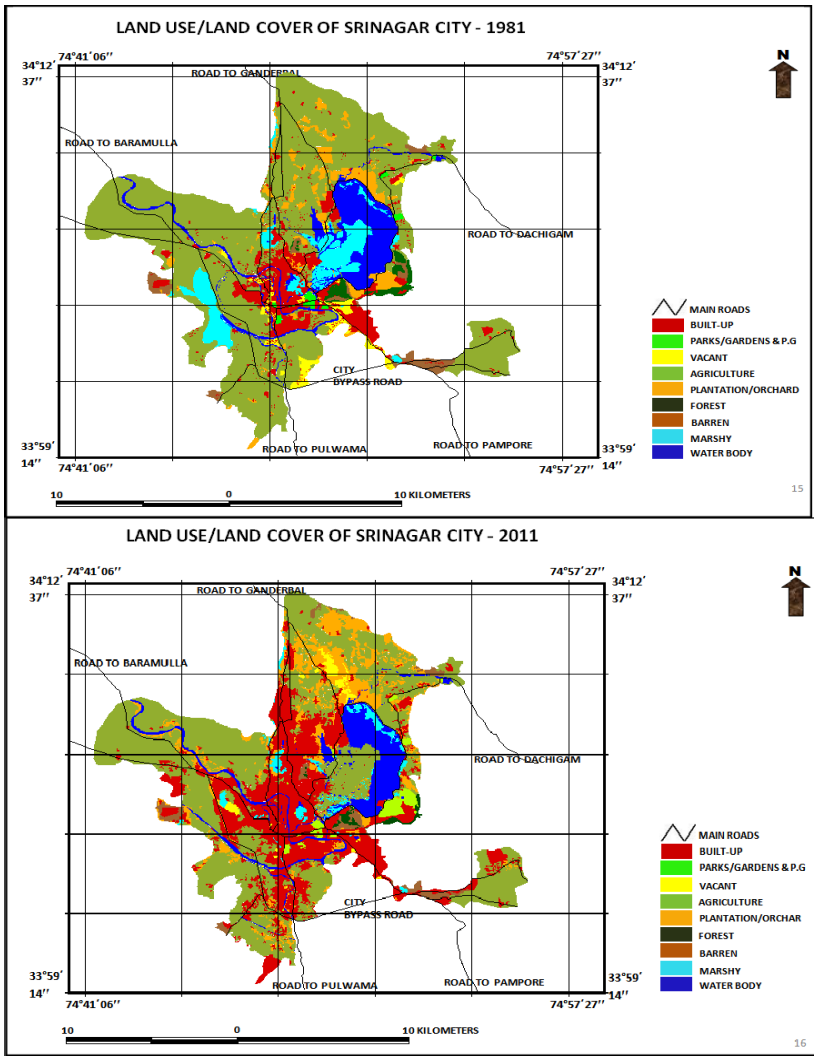
4.2 Population Growth

Soaring growth of population is a general dilemma of the the majority of urban hubs throughout the budding world that is in developing stage. on the subject of population of city, the figures are comparatively reliable since 1901 A.DIt amplified from 122,618 individuals in 1901 A.D. to 122,5837 individuals in 2011 A.D. signifying almost ten times raise amounting to 900 % increase amid a net augment of 110,3219 individuals. The model of decadal increase nevertheless, had not been identical. After 1961 A.D. new period of population expansion commenced. The inhabitants of the Srinagar city amplified from 285,257 people in 1961 A.D. to 606,002 people in 1981 A.D. with a total increase of 320,745 individuals with shocking growth pace of 34.31 and 40.13 % correspondingly. The major reasons accountable for this alarming population increase through this phase have been in immigration raise in origin paces and downfall in demise paces. In addition to this, the combination of 62 rural communities of villages in urban limit in 1971 A.D. and the opening of city cluster model which brought various number of rural regions beneath the control of city of Srinagar are in fact the other reasons causing the speedy growth of the Srinagar city people. consequently, from the period of 1981 to 2011 A.D. the residents amplified to 971,357 people in 2001, with a total increase of 365,355 individuals in these two decades with a net decadal increase pace of 30.14 % and 122, 5837 individuals in 2011 with a total addition of 254,480 individuals for the period of the previous ten years. This expected speedy alter in the demographic aspect of Srinagar city is stiffened to trend a bang on the socio financial arrangement of Srinagar city and it can draw attention to the problems of, land speculations, slums, urban disfigurement and housing insufficiency.

4.3 Land conversion in Srinagar City

Land is in a constant shape of conversion as an effect of a range of innate and synthetic practices. Land conversion has been declared as one of the vital means of individual inducing ecological conversion. A key feature of change recognition is to establish what is in point of fact i.e., which land utilization set is shifting to the other set. This data shows changes both pleasing and unwanted and sets that are comparatively firm over the period of time. This data also serves as a fundamental instrument in supervision results. Throughout the investigation phase city has not only stretched from its original basic range but also there was noteworthy transaction of land amid different land cover/use classes. These kinds of changes are since the growth of Srinagar city causing amplified requirement of land for housing, commercial, business and several other purposes. This request of land space along with the site magnetism, purposeful magnetism, serviceable expediency and the land worth to meticulous area eventually manipulate the speed and track of city land conversion and transformation. From Maps it shows transformation between1981 to 2011. Noteworthy land conversion was witnessed between built-up region, empty, water bodies, plantation, orchards, marshy lands, agriculture and. Built-up area greater than before by about 3835 hectares, it is capturing the land primarily from plantation, vacant, marshy area, agriculture, and orchards. Gardens, play grounds, and Parks enlarged by 232 hectares, getting hold of the area from forest area, plantation and orchards. Plantation land had lost about 689 hectares; this sum of loss of land was add for parks, orchards, built-up, and to empty area. At the similar period of time orchard/plantation had gained 1355 hectares from water body, empty land, agriculture, forest land and

marshy land. Empty land that is vacant had lost around 262 hectares to the built-up region for housing and development for business-related activities and also for farming and extension to horticulture region. Uncontrolled development and volatility of politics in the region of Kashmir has also its part in converting the Srinagar city into unorganised one Additional progress and construction in the Srinagar city will lead to dangerous land conversion. The Master plan Although for the city and the state as well has been prepared already but the working has not been implemented yet.



4.4 Land Consumption Ratio, Consumption Rate, and the Future Projections

Progressive spatial extension of a city is indicated by land consumption rate i.e.; by calculation of density; it being lofty from 1981 to 2011 and as per the proposed area consumption, it will increase between 2011 & 2021, since on growing inhabitants. land absorption coefficient also being assess of usage of new city area land increase by each unit in urban inhabitants was noteworthy from 1981 to 2011.Thus this suggests that for progress the pace at which new land areas are acquired by people is all time high. At the anticipated expansion of city, it will be all time high from 2011 to 2012. Also, this may be a fashioning trend from 2011 to 2021 as the city seems to be the spreading out of centre towards the periphery in outskirts. This situation is because of the reality that the capital core centre of the city has become more congested. Strategies and plans have been made by Govt. and to de-congest the internal core city area where in a variety of private offices and government have been moved to the west side of the city. Furthermore, the economically well-off individuals from the internal core city areas choose to shift towards the peripheral outskirts on open an and wide regions. Table 7 below shows the figures of land cover and land use projection up to period 2021.This kind of action is taken sensibly with the purpose of providing a within reach to condition of capital city that how will it look like by the end of 2021.On contrasting the data with table 2 below there are noteworthy changes in lessons from 2011 to 2021. The proposed data thus reveal that the agri. maintains the maximum amount of share in the net land consumption and is followed by the area of built-up class., parks, gardens, Vacant land, forests, keep hold

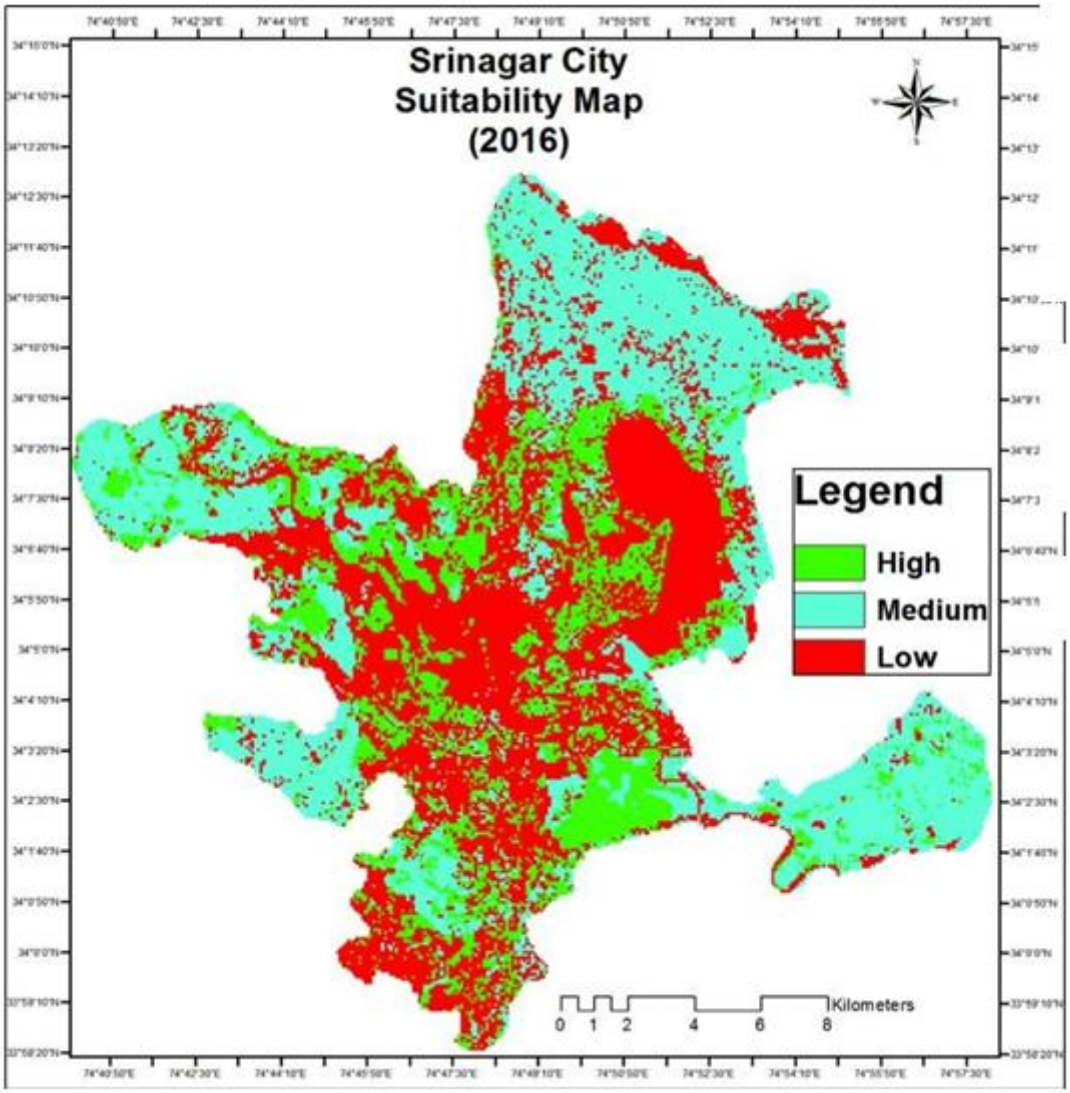
of the least share. Orchards, water body and plantation maintain noteworthy position amongst all the land consumptions.

4.5 Integrated analysis for urban suitability

The city urban land utilization suitability map has been assembled into 3 classes namely less suitable, moderately suitable, and highly suitable. The urban land suitability map is shown below in Fig.4.7. It displays that as the inner core wards of the city have sufficient urban amenities in contrast to outwards, hence peripheral wards usually show intermediate level of suitability for setting up urban amenities. These peripheral outer wards although have insufficient urban amenities but due to numerous factors like, steep slope, high altitude, inaccessibility etc. these peripheral wards fall in intermediate level of suitability. Because of altitude, favourable slope, accessibility etc. the urban municipal wards that lie between core and peripheral out wards shows high suitability for the stipulation of urban amenities plus lack of urban amenities that already exist. The wards showing soaring suitability are Mehjoornagar, Tealbal, Iddgah, Pandrathen, Jogilangar, Hassanabad, Palpora etc. chased by peripheral outer wards, viz, Dara, Khonmoh, Alesteng, Humhama, Harwan, Zakura, etc. which illustrate intermediate stage of suitability. The inner core wards of the Srinagar city like Lalchowk, Nawab Bazar, Wazirbagh, Mukhdoom Sahib, Zadibal, Kawdara etc. display low suitability because of having sufficient amenities. Also, the utmost region in these old city wards is under built up class, thus having scarcity of area/space for founding of urban amenities. The wards like Bud dal and Lokut dal also demonstrate low suitability as being situated on the shores of famous Dal Lake on which the construction is strictly prohibited. The suitability model of urban amenities in city is shown in Fig.4.7 below, so It is obvious from the fig. that the south-eastern parts, north-western parts and north eastern of the Srinagar city display medium or intermediate level of urban suitability. The inner core wards of the city in a circular manner possess low urban suitability. The high urban suitability is illustrated by the medium wards that lie between peripheral and core wards.

YEAR	LAND CONSUMPTION RATE	YEAR	LAND ABSORP TION COEFFIC IENT
1981	0.004	1981/2011	0.006
2011	0.005	2011/2021	0.005*
2021		0.005	

LAND USE LAND COVER PROJECTI ON FOR 2021	BUILTUP	PARK	VACANT	AGRICULT URE	PL/OR	FOREST	BARREN	MARSHY	WATER BODIES	
2021	AREA IN HECTAR ES	8051.34	499.34	157.68	9286	3027.67	77.68	467.35	78.35	1801.6
AREA IN PERCEN TAGE	34.33	2.12	0.67	39.60	12.91	0.33	1.99	0.33	7.68	



IV. FINDINGS

There is no clear mechanism put in place to lessen gap between available land and growing population the broaden gap involving the the population growth and available land has made rise in land utilization pace and coefficient of land absorption which illustrates the expansion of city. Also, the estimation of proposed inhabitants experienced that transformation until 2021 may probably follow the fashion of 1981 to 2011 all circumstances being identical. This possibly will guide to other urbanized overcrowding and spreading out of the Srinagar city on the lush agri. land in its periphery.

Non-economic development of rural areas

The financial progress in the capital has prompted community conversion that leading to modify and interchange of land use classes. The land use of city provides accommodation to private resource centres, various government, and every decision-making centre, which lays downs a sequence of relations, and enhance activities of the people of city with the individuals of diverse regions and urban heart of the Kashmir valley. This has prompted the individual movement from rural and backward regions to the Srinagar capital, it has drawn attention to the practice of land utilization transformation and changes.

No policy on effect of urbanisation on climate change

Urbanization may have an effect on the local environment all the way throughout its pressure on the plane irregularity. This may also produce a local climate warmer significantly than the neighbouring region by the warmth that is released by heavily settlements of colonized individual by variation in evaporation and its characteristics by altering the extensive outgoing wave radiations. This is recognized as island of urban heat. The effect on local climate may be visible but minute. It may on the other hand have a noteworthy effect on

lengthy instrumental high temperature reports since stations influenced by growing urbanization. On July 15 in year 1973, the maximum temp. in the capital that was ever recorded was 35.5 C and then on July 7 in year 2006, the temperature recorded was at 39.5 C. According to Annon (2006).

No Identification of urban zones of city

Being the chief city Srinagar capital of the region was conferred by ―God with rivers and lakes‖ used to operate through intense rainy spells like sponges, however due to constant reduction of the Jhelum River and the lakes there is a danger of flood constantly. The technique of Supervised classification of the pictures will be triumphant to learn about the transformation discovery of land cover and land use in the area, this process offers a proper method to recognize urban zone development which led to conversion in the land cover and land use pattern that as a result has immense impacts on the environment of landscape.

No guiding principle on population growth

Throughout the earlier period century in later half, the scale of increase of population and consequential spreading out and land cover transform in city has progressively more presumed from noteworthy to hostile fractions. The capital city of Srinagar has tenfold times grown in provisions of populace and may twentyfold times more than in requisites of region between year 1901 to year 2011 AD. lack crucial policies and practices of sustainable land management to avoid the endangering of the environment and sustainable development The size of the population of the city capital is proposed to to go beyond 1.7 million marks and this region of the urban city centre is anticipated to reach about 750 km2 up to year 2031.

V. CONCLUDING STATEMENT

The growth of the city in the nearby rural areas due to expansion of the population leads to urban sprawl or rural urban fringe. This growth, if not performed by the government in a planned manner, is usually haphazard and leads to several ecological degeneration. Decentralization of some advanced order tasks should take place as or else this leads to dilemmas like traffic jams, pollution and traffic congestions and other in the core of the cities. The valley of Kashmir can ‘t affords to have huge railways, highways, cement factories, Industrial Estates, shopping malls etc. in view of unique geography and lesser availability of land. We cannot compete with states like Maharashtra, Haryana, Punjab, UP or other vis-a-vis infrastructure and development. Our future generations will curse us if we do not stop this loot, plunder and unholy practices of land utilization.

When we talk about smart cities, one constituent is there that is at the core of it i.e.; Urban Planning in actual fact, A smart town can't be planned while not meticulous and elaborate urban coming up with. Urban planning can be defined as the _structural scaffolding of a smart city, its optimized layout plan as well as support system the of the city. Synchronization with the technological and infrastructural needs of a feasible smart city structure hence stems the need of modification the fundamentals of urban planning. With rapid technological advancements in the 21st century, a lot of old urban planning models have already become obsolete. This ensures that the focus should be on amalgamating latest technology goals and urban planning guidelines while recognizing the importance of sustainability. since a lot has changed over the decades, it should fundamentally reflect in urban planning strategies that focus on the future.

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