

Smart Utilization of Land

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Abstract: *This paper incorporates the investigation of smart use of land and planning of land utilize arrive cover guide of the examination zone by utilizing ARC-GIS programming. This guide demonstrates how arrive utilize changes over past for doing different urban arranging and administration exercises by using Google earth pictures which is open source. The goal of this investigation is to outline evaluate the rate of progress. Land utilize arrive cover changes at the investigation territory which can push chiefs to replan the utilization of common assets proficiently. On the off chance that financial plan is a limitation in buying high determination satellite symbolism, at that point one could consider using free Google earth pictures as proposed think about. Land use arrive cover changes is viewed as a standout amongst the most vital flag of territorial natural changes. Smart city ventures are essential for urban arrangements in as much as they take into account a rehash of regions smart city is a decent program since it can go for building up another type of innovation and human advancement of gainful stage. ARC GIS is utilized to recognize the land design. Smart is nothing yet digitization. ARC GIS is utilized for portrayal of information on outline distinctive scale. Add up to range is part into agricultural, residential, water bodies, open land etc so on. There is detectable change in arrive utilize arrive cover guide of study range happened in a decade ago.*

Introduction

Land is the most important component of the life support system. It is the most important natural resource which embodies soil and water, and associated flora and fauna involving the ecosystem on which all man's activities are based. Land is a finite resource. Land availability is only about 20% of the earth's surface. Land is crucial for all developmental activities, for natural resources, ecosystem services and for agriculture. Growing population, growing needs and demands for economic development, clean water, food and other products from natural resources, as well as degradation of land and negative environmental impacts are posing increasing pressures to the land resources in many countries of the world.

For India, though the seventh largest country in the world, land resource management is becoming very important. India has over 17% of world's population living on 2.4% of the world's geographical area.

India envisions that infrastructure across the country must expand rapidly. Industrialization, especially in the manufacturing sector, is inevitable and will accelerate. Urbanization is on drastic rise. Agricultural lands are becoming important as livelihood of a significant amount of the country's population is dependent on it. For all these, land is an essential requirement. In addition, the Government also requires land from time to time for a variety of public purposes.

The developmental targets of India on one hand and the social, cultural and environmental aspects on the other hand demand land. These demands for land could be competing by different sectors for the same land or even leading to conflicting land uses once put to a use by a sector. In the recent years, there has been tremendously increasing pressure on land in India challenges for sustainable development.

There is a need for optimal utilization of land resources. The country can no longer afford to neglect land, the most important natural resource, so as to ensure sustainability and avoid adverse land use conflicts. There is a need to cater land for industrialization and for development of essential infrastructure facilities and for urbanization. While at the same time, there is a need to ensure high quality delivery of services of ecosystems that come from natural resource base and to cater to the needs of the farmers that enable food security, both of which are of vital one significance for the whole nation. Also, there is a need for preservation of the country's natural, cultural and historic heritage areas. In every case, there is a need for optimal utilization of land resources.

The term smart city was inserted into the communitarian official document in 2009. The concept was introduced for first time in 'Strategic Energy Technology Plan' (SET), there it defines a smart city as a 'city that makes a conscious effort to innovatively employ information and communication technologies (ICP) to support a more inclusive, diverse and sustainable urban environment. At first it

was thought that smart city would be like a digital city. The concept of smart land is an extension of smart city, it is connected to sustainability and green economy.

Literature Review

A review of important studies which utilized Google earth images in classification for urban related applications was attempted and presented in this section. The authors mentioned that use of due to the high cost of very high resolution satellite images such as Worldview_2 having a spatial resolution of 0.46m with eight spectral bands, it is not possible purchase and use it even though it has wide variety of applications in the field of urban planning. In all the studies reviewed it was found that the authors have used images from sensors such as Landsat, LISS-3 to prepare landuse map of different year for urban applications. For most of studies it was downloaded from global land cover facility(GLFC), GLFC provides satellite data at free of cost but it has certain limitations. Images provide by GLFC are of medium resolutions only with pixel size ranging 30 to 80m therefore it is not possible to see each and every thing clearly. (K. Malarvizhi, S.Vasantha Kumar and P. Porchelvan, 2015: ICETEST).

The land availability of land within the city are fixed and cannot be limited meet the needs of the population. High utilization of land for residential areas along with increasingly high rates of population growth either naturally or migration. (Diah Intan Kusumo Dewi, Anita Ratnasari R, Pangi, 2016: Cities 2015 International Conference). The present study tries to create an alternate solution for all the above said problems by using free Google earth images to prepare landuse landcover map. In this google earth images one can clearly see roads, residential area, agricultural area, water bodies, open land, forest etc. clearly and it can be digitalizing by using ARC-GIS. (Mohammed Esmail, Ali Masria, Abdelazim Negm, 2016: HIC). Google earth images provides latest satellite images having spatial resolution less than 1m and also it provides images taken at different time periods.

Nowadays there are various popular software's for image processing and GIS software's like ARC- GIS, Global Mapper, ERDAS, IMAGINE, ENVI etc. That software's have provided tools to visualize and import google earth images. (Qing chang, Xue Li, Xiulan Huang, Jiansheng Wu, 2011: ICESE).

Though there are more advantages of using Google earth images but there are very limited studies have performed on the use of this excellent data source for preparation of land use land cover map (Ohri and Poonam,2012: Jacobson et al.,2015).

There is one limitation of using Google earth image that it is not possible to obtain multispectral band data and therefore image classification by using

unsupervised or supervised techniques cannot be carried out. Due to high resolution on- screen digitalization in ARC-GIS can be easily done.

Data Collection

Pune coropration territory is taken as an examination zone. Figure no. 1 demonstrates the base guide for the investigation zone and figure no. 2 demonstrates the current Google earth picture for the investigation range. Pune is the ninth most crowded city of India and second biggest city in the province of Maharashtra after state capital Mumbai and is additionally 101th most crowded city on the planet. It is arranged 560m above ocean level on Deccan level. On right bank of the mutha waterway. Pune city is the authoritative head quarter of Pune region and was previously the focal point of energy of Maratha Empire built up by Shivaji Maharaj. Pune is the social capital of Maharashtra.

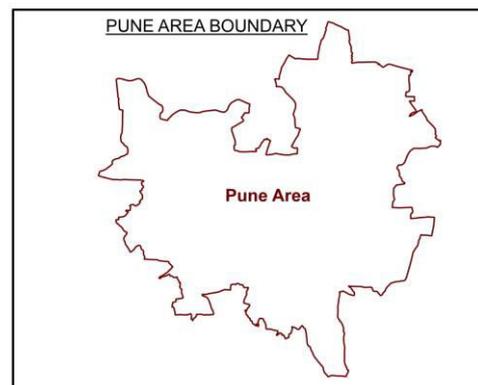
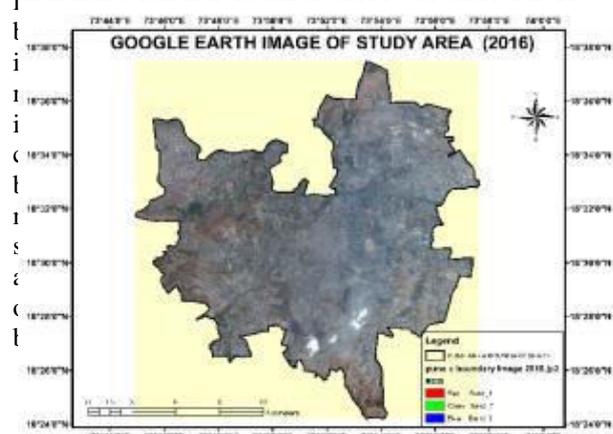


Fig. 1. Map showing Pune corporation area.

(SOURCE- WWW.PUNECORPORATION.ORG.)

For the metropolitan city like Pune, urbanization is a noteworthy concern. More individuals are moving from rustic territories to urban areas like Pune city for



1.1. Figure and Table Captions

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Fig. 2. Google earth image of study area (2016)

Result And Discussion

The present examination means to set up the land utilize arrive cover delineate Google earth picture for Pune city company zone. The refreshed (2016) landuse and landcover guide of Pune metropolitan organization zone is set up by using Google earth picture is appeared in figure 4 and figure no. 3 demonstrates the landuse and landcover guide of Pune enterprise region for year 2008.

Above maps demonstrates the different regions with various hues falls under residential area, agricultural area, open land, roads, forest, water bodies etc. and so forth changes among the different land utilize arrive cover classes are evaluated. Advanced change recognition is the way toward portraying changes in arrive utilize design. The outcome demonstrates that the local location is expanded.

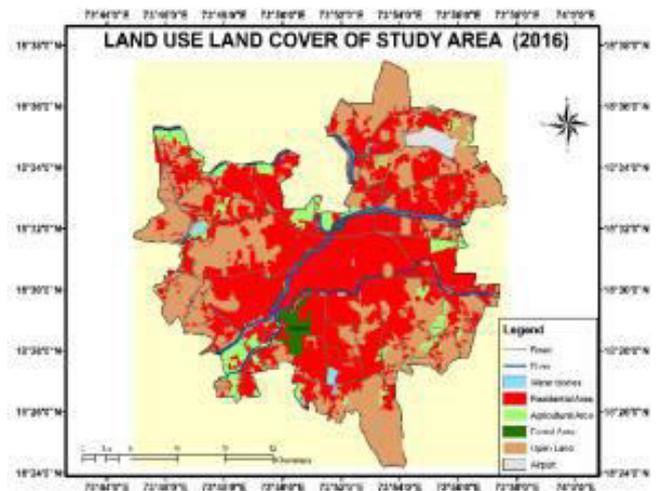


Fig. No. 3. Land use land cover map of study area (2016).

Table 1. Comparison Of landuse landcover map for 2008 and 2016

SR.NO.	LANDUSE	TOTAL AREA IN Km ²	TOTAL AREA IN Km ²
		2008	2016
1.	RESIDENTIAL AREA	106.12	144.65
2.	AGRICULTURAL AREA	5.75	2.35
3.	OPEN LAND AREA	65.05	49.5
4.	FOREST AREA	20.72	10.38
5.	WATER BODIES AREA	14.52	8.83
6.	ROAD AREA	31.82	34.29
7.	TOTAL AREA	243.98	250

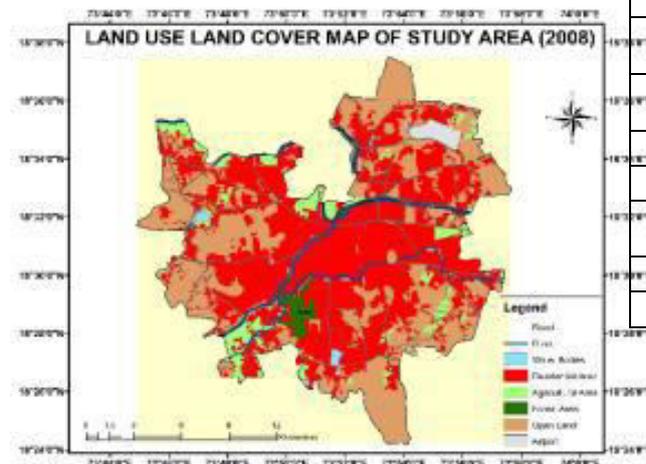
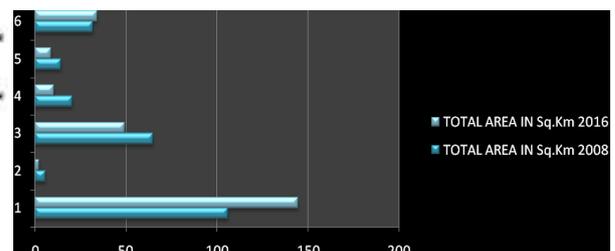


Fig. No. 3. Land use land cover map of study area (2008).



Graph No- 1. Comparison Of landuse landcover map for 2008 and 2016

From the above graph it is clearly found that the residential area and road area is increased by 14.36 % and 0.67% respectively from 2008 to 2016 and agricultural area is reduced by 1.42% . Open land area is also reduced by 6.86%. forest area and water bodies area is reduced by 4.34% and 2.42% respectively.

Conclusion

In the recent decades, most of the cities like Pune are facing the urbanization because peoples are migrating from rural area to urban area for better job, opportunities and living conditions in recent decades due to economic growth in country, and this migration of people from rural area to urban area is unavoidable urban developer understand the current land use land cover pattern of that area and then urban developer should able to know how land use land cover of that area changes over the years

Pune municipal corporation area is taken as a study area. By using ARC- GIS software On screen digitalizing is done. The area of various land use classes is digitalized and land use land cover map is prepared by utilizing Google earth images of year 2008 and 2016. After observing land use land cover map of 2008 and 2016 there is a observable change detection in land use pattern.

It is clearly found that the residential area and road area is increased by 14.36 % and 0.67% respectively from 2008 to 2016 and agricultural area is reduced by 1.42% . Open land area is also reduced by 6.86%. forest area and water bodies area is reduced by 4.34% and 2.42% respectively.

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