



## EFFECTS OF URBANIZATION ON SMALL STREAMS : A CASE STUDY OF MOSHI STREAM (PCMC)

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### Abstract

Urban expansion has increased the exploitation of natural resources. Land use Land cover (LULC) has changed natural drainage system. This paper will be highlights the effect of change in land use on natural drainage system. We have selected the study area from PimpriChinchwad Municipal Corporation (PCMC). These LULC classifications were based on primarily on Google Earth Image dated on 20 January 2005 and 17 January 2016 and using with GIS software. There is major decrease of open area, agriculture land and increasing urban built up area so these manmade activities are affected on natural drainage system.

Keywords—Urbanization, Drainage, Land use, Built up

### Introduction

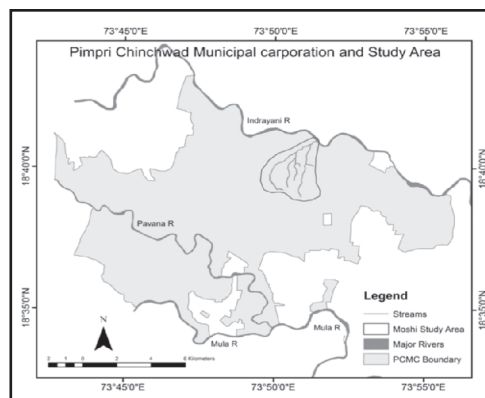
Growths of urban areas are increasing the rate of exploitation of natural process, system and resources (Booth, 1991; Kadam, 2002). Urban growth has also changed land use and land cover (Bhagawat, 2011; Temesgen et al 2014). UNO 2011 has rightly predicted that the world's urban population shared about 52 per cent to the total population. Urbanization have worldwide phenomenon where all mega cities are rapidly developing due to various factors including population increases, industrialization and rural-urban migration (Kadam, 2003 and Das et al, 2012). As per 2011 census, in Maharashtra urban population is 45.23 per cent and Pune District urban population 60.9 per cent. These changes are very useful for policy makers, particularly for town planners (Jieying et al, 2005; Golamet al, 2008).

The increase in urban population density and built up areas directly or indirectly affects on river and small streams or tributaries (Odha). through : a) Change in streamflow b) Changes in flow characteristics, c) Decline in water quality and d) Changes in tributaries way (Klein, 1979; May et al 1999; Kadam et al 2013)

### Study Area

The study area is a part of the Pimpri-Chinchwad Municipal Corporation (PCMC) in the Pune district state of Maharashtra (Chinchwad Municipal Corporation India). Pimpri- (PCMC) is situated to Northwest on Mumbai Pune National highway.

PCMC is located at 18°33' to 18°43' North latitude and 73°42' to 73°56' East longitude.



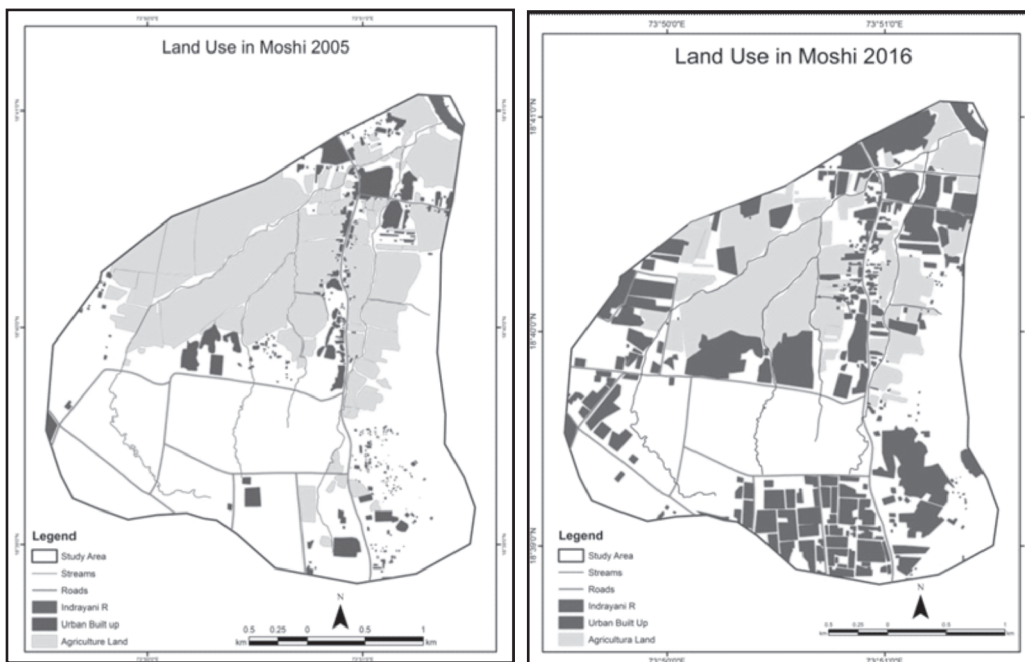
Selected Moshi study area is located at 18°38'47" to 18°41'05" North Latitude and 73°49'33" to 73°51'33" East Longitude.

Methodology

The land use classification for the PCMC was based primarily on Google Earth Image dated 20 January 2005 and 17 January 2016. This Google Earth Image has digitized manually. The study of landscape patterns and spatial statistics were carried out using various GIS software. The built up area also change in direction of tributaries. Residential and commercial purposes some people are occupy stream and tributaries basin and catchment area.

Map 1

Map 2



Result and Discussion

Table - 1 having comparative values of two different years

Classes	Area For Year 2005		Area For Year 2016		Difference (in per cent)
	Area (sq. km.)	Proportion (in per cent)	Area (sq.km.)	Proportion (in per cent)	
Urban built up	0.53	05.41	2.44	24.75	19.34
Agriculture Land	2.92	29.60	1.82	18.50	-11.10
Water Bodies	0.04	00.37	0.04	0.40	00.03
Open Area	6.36	64.62	5.55	56.35	-08.27
Total Area	9.85	100	9.85	100	

Map land 2 shows that urban land use in Moshi area in PCMC. Land use has classified in urban built up, Agriculture land and fallow land. In Moshi built up area has increased and agriculture

land and fallow land also decrease. Some places, manmade activity have been affecting the natural drainage systems. Such as village Moshi Goanstream and other tributaries are replaced at built up and other purposes. All stream length is 15.36 km but near JalVihar and KendriyVihar 0.75 km stream totally vanish by buildings.

Table 1 shows general land use of study area. In the year 2005, open area and agriculture land are 6.36sq.km and 2.92sq.km respectively. In the year 2016 open area is 5.55sq.km and agriculture land 1.82sq.km. Net change areadifference between 2001 and 2011 in urban built up is 19.34 per cent. Due to rapidly increase urban built up area agriculture land and open area are reduce in -11.10 and -8.27 percent respectively.

### **Conclusion**

The present study has shown that GIS techniques have remarkable potential for mapping and monitoring of land use. There is major decrease of open area, agriculture land and increase in residential, commercial, area from year 2005 to year 2016. Due to rapid urban growth have been change in small streams flow and vanish the stream.

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