Environmental Impact Assessment of Urbanisation on Nagpur and area around, Nagpur District, Maharashtra, Using Remote Sensing & GIS

Introduction

Urbanization is a phenomenon in which concentration of people increases towards a urban center due to migration causing the change in the system which is not able to sustain the load and hence there are numerous problems such as disruption of water supply system; sewerage system; storm water drain; supply of basic amenities. Surface water system; recharge of groundwater; sanitation. There are expectations but to fulfill them are greatest problems.

Nagpur also urbanizing in the similar manner and project intends to understand that how urbanization of Nagpur has changed the classification of land use /land cover. This also attempted to understand future trends..

Nagpur being a historic city of around 300 years has a glorious background which cannot be denied. Its surrounding also has great influence on the day to day life of the city.

Not only the historical importance but also economic, communication,

Transportation aspects regarding Nagpur are important.

The famous zero mile the datum geographical origin point of India is situated in Nagpur.

The Nagpur is known as Orange city. And it is called second capital of Maharashtra.

The topography here is pleasant. Climate is pleasant.

Being centrally situated all major railway and road ways connect with the Nagpur.

Number of businesses industries and mines are operating here. Hence many of the related governmental and non-governmental offices are here.
The general trend is urbanization is taking place primarily on waste land then followed by agriculture, followed by forest. Lake like Shukkarwari lost large portion of it before 1976, But then Nagpur got Raman Science Museum. Sakkardara and Sonegaon need proper attention. This is also true about Nagnadi and pipoli nadi, To Maintain our natural heritage, is not only our need but also our identity

Methodology:

It involves three technologies Namely Remote Sensing, GIS and GPS.

Remote Sensing: Remote sensing is technique of collecting information about object without coming in contact with it. The same can be used for earth surface. This is done by sensing and recording reflected or emitted energy. Then processing, analyzing and applying that information.

GIS A geographic information system (GIS) is a computer-based tool for mapping and analyzing spatial data.

Map making and geographic analysis are not new, but a GIS performs these tasks better and faster than do the old manual methods. Today, GIS is a multi-billion-dollar industry employing hundreds of thousands of people worldwide. GIS is taught in high schools, colleges, and universities throughout the world. Professionals in every field are increasingly aware of the advantages of thinking and working geographically. A working Geographic Information System seamlessly integrates five key components: hardware, software, data, people, and methods

Result and Discussion

As already noted earlier a toposheet of 1976, satellite Imageries of 2000 and 2013 were used for change study of land cover land use. They were compared to establish relative changes in agriculture, built up, Forest Water Bodies Waste Land. The radius of 10 km was taken for study area. The areas were in hector. After classification percentage share of each unit was calculated So as to prepare pie diagram and to understand statistical distribution of different classification unit.
Both the values are expressed in Table-F, the satellite image and classification chart are also displayed.

Cropland was having highest percentage amongst in all categories in 1976(68.08). In all three years also it is highest. It is lowest (25.67) in 2013. Thus there is gradual reduction in the percentage of cropland. Thus there is 42.42% loss in agriculture land.

Forest land shows change from 2013 (7.75) to 1976(6.48) Thus showing marginal gain (1.27).

Waste land show change 1976 (5-27) to 2013 (5.52). Showing almost the same condition. The change is of about (0.25).

Water bodies show change 1976(1.40) to 2013(1.64). It shows almost the same condition The diffence is (0.24%).

Thus it can be said forest land has increased although slightly. Waste land and water bodies show marginal change.

But when we observe Built-up sprawl there is enormous increase. It increases from 1976 (18.77) to 2013 (59.40). With a Change of 40.63%. Thus overall the growth of built-up sprawl is on agriculture land. Further when we observe further classification under built-up sprawl we get at least four categories namely: Rural, Urban, Industry and transport. Urban shows highest gain followed by Rural category then industry and transport, However in 2000 transportation category is showing more gain than Industry, When we compare Urban with rural built-up we find great difference this is obviously due to flow of rural population towards Urban settlements.

In general it can be said that growth of settlement has taken place from mainly agricultural land along with other categories.

Another important thing one should note that growth is uniform in all direction. It shows peripharl growth.

Nagpur at this juncture looking for two major revolutions: In tranport and Industry with Mihan (The Multi-modal International Cargo Hub and Airport at Nagpur (MIHAN) and metro, Metro region coming in existence this will be realized.
Housing also is on growth. All this need land but not at the cost of ecology. Nagpur is from very older days a developing settlement and will do so in future. Each of Nagpurian is well prepared for these. Still people are conscious regarding the nature and natural resources. The above values shows a ratio of 60:40 approx. between urban sprawl and natural settings. If we can maintain 50:50. It will be pleasant condition

Conclusions:

The analysis of data indicate that growth of urban settlement is even whean taken place it is to a great extent is in 60:40 ratio between Urban sprawls to other parameters. The growth of city is peripheral and along corridors joining the city to suburbs. This phenomenon may be due to ring roads. Even though sprawl has grown and forest has low profile still its area % remain constant. Same is the story with water bodies. Greenery and water bodies not only maintained but should be manage aesthetically. All the water bodies needs urgent attention. These are coolant for city and also help in rains. We can get homes but for breathing we need greenery and water. For maintaining temperature both are required.

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