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URBAN MANAGEMENT PLANNING USING GEOSPATIAL TECHNOLOGY FOR PART OF HYDERABAD CITY, TELANGANA

Engineering

KEYWORDS: Urban Management Plan, RS & GIS, GPS, ARC GIS and Geo-spatial Technology

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ABSTRACT

urban environment which is a major challenge to the urban planners, administrators and public representatives. Remote Sensing and GIS can be used to prepare a comprehensive database of all the properties in order to achieve the fullest tax collection by checking the under-assessed, un-assessed property tax. It will also help to compute the property tax applicable in a transparent and expedient manner. It will not only help the citizens but also help the administrators in increasing the property tax compliance substantially. The geospatial technology helps in mapping the study area, which will help in preparing the correct geo-referenced Base map showing updated Information on plot boundaries and subdivisions. The use of RS and GIS techniques are useful to do the preparation of Master Plan work more expeditiously and accurately. Based on the maps, it will be easy to designate the properties with unique identification number which can be used for various purposes including the GIS applications in property tax also. The map also contains the other features such as roads, streetlights, manholes, dust bins etc which has a lot of utilitarian value in the city administration. This comprehensive database will help in improving the operational efficiency by enhancing fault tracking, plugging leakages and reducing wastage in the utility assets such as water or waste disposal etc. One of the biggest challenges in the urban areas is the disposal of solid waste generated every day. Geospatial technology is a potential tool which can be deployed to identify potential land fill sites and plan the travel logistics for the waste disposal vehicles. The Urban Growth Management using RS and GIS is a powerful tool which can be used successfully. It will not only strengthen the city governance process and improve citizen services but also help in easy and hassle free administration and increase in revenue realization.

1. GENERAL

Urbanization is an index of transformation from traditional rural economies to modern industrial one. Kingsley Davis has explained urbanization as process of switch from spread out pattern of human settlements to one of concentration in urban centers. Historical evidence suggests that urbanization process is inevitable and universal.

Urban areas grow in area and population every day, calling for more resources, better living spaces and improved administration. In 1950, only 28 percent of the world population was urban. Today, more than 45 percent of the world stays in urban areas . By 2008, more than half will be living in urban areas, and it is expected by 2030, this figure will cross 60 percent (World Bank, 2005). Urban areas change in its structure and morphology in varied manner, owing to natural growth as well as the socioeconomic aspirations of the cities. With the rise of global networks of capital, the race between cities to compete has coupled with actions to cope with its own growth. In this backdrop, the position of environment becomes an element of criticality, concern and debate.

2. PROBLEMS OF URBANIZATION:

Problems of urbanization are manifestation of lopsided urbanization, faulty urban planning and urbanization with poor economic base and without having functional categories.

i. Due to such urbanization, certain basic problems are being witnessed in the fields of:

a. Housing,
b. Slums,
c. Transport ,
d. Water supply and Sanitation,
e. Water pollution and Air pollution,
f. Inadequate provision for social infrastructure (school, hospital, etc).

ii. Most of these cities using capital intensive technologies can not generate employment for the distressed rural poor. So there is transfer of rural poverty to urban poverty.

iii. Megacities grow in urban population not in urban prosperity, and culture. Hence it is urbanization without urban functional characteristics.

iv. Urbanization is degenerating social and economic inequalities which warrants social conflicts, crimes and anti-social activities.

v. Lopsided and uncontrolled urbanization led to environmental degradation and degradation in the quality of urban life--pollution in sound, air, and water, created by disposal of hazardous waste.

3. OBJECTIVES:

1) To study and understand the existing strategies of urban planning, development and management of Hyderabad city for **(Circle-V).**

2) To produce high quality digital maps for enhancing the capability of inventory, mapping, monitoring and modelling to many environmental processes and urban planning using Remote Sensing, GIS, GPS and Field studies.

3) To develop data base with special reference to revenue generation such as property tax, utilities and infrastructure such as road network, street lights, storm water drainage system, water supply, garbage disposal, greenery, open spaces and horticulture.

4) To identify the critical factors in each of the services of the urban local body and to examine the process of re-engineering through the deployment of Remote Sensing technology, GIS and GPS to enable more efficient, reliable and timely services in a transparent manner.

5) To create integrated information system (IIS) using Remote Sensing techniques on GIS platforms.

4. RESULTS AND DISCUSSION:

An integrated **Urban Management Plan** is thus needed to provide for such an exchange of data that will not only guarantee rapid access to data whenever and wherever required but also prevent detrimental duplicalication and degradation of the system.

1. Geospatial Technology should form the core of the IT strategy of Urban Local Bodies.

2. The Urban Local Bodies have valuable and large data in the shape of maps, plans, registers, records etc. The computerization of the records and GIS are the solutions to preserve, update, retrieve and analyze the data and helpful for decision-making and advantageous and dependable in crisis management.

3. Remote sensing and GIS help in preparing the correct geo-referenced Base map showing updated Information on plot boundaries and subdivisions.

4. The preparation of Master Plans is a statutory obligation on ULBs. Due to increase of population and physical growth, the preparation of Master Plan is a gigantic task. The use of RS and GIS techniques are useful to do this work more expeditiously and accurately.

5. Based on the map prepared it helps to designate the properties with unique identification number which can be used for various purposes including the GIS applications in property tax also.

6. The map also contains the other features such as roads, streetlights, manholes, dust bins etc which has a lot of utilitarian value in the administration of an ULB.

7. Since the maps are digitized the regular updating of the map will be easy whenever a building permission is given or a road is repaired or re-laid.

8. Due to the usage of the real-time data it saves not only the time and enhances the accuracy but it also avoids the repetition of the same work and increases the confidence of the public in the administration.

9. Property information such as type of building, number of floors, number of units, area, density, taxation, zoning, use of the buildings, tax collection etc are easily known and can be retrieved.

10. Location of all taxable property with types of uses of the properties can be identified.

11. Since the data pertaining to the vacant lands are also captured it is very effective in fixing the vacant land tax and collection of the same as this is one of the major items of pilferage in the absence of clarity.

12. It also helps to zone the properties depending on the use of the properties. Helps to calculate an amount of tax to be collected from individual property.

13. It also helps in find out the range of properties based on the tax-range.

14. Collection of tax can be streamlined by fixing the targets to the bill collectors in issuing the demand notices based on the routes of the bill collectors. Their work load can also be fixed as per 'the equal work per field staff.'

15. Since there is a possibility to attach the photograph of the property to the land parcel on the base map, it is easy for the Officers to find out the defaulters who have not paid the tax arrears by making the relevant query.

16. Since there is a provision to attach the photograph of the property it is to identify the under-assessed properties also.

17. It is also easy to find out the defaulters with huge arrears of tax and also period of non-payment. It helps in estimating the revenue generation from property tax arrears of property tax.

18. The tax collection centers can also be fixed for the convenience of the tax payers based on the spatial distribution depending on the density of the area.

19. By superimposing the attribute data on the map pertaining to property tax assessment, demand and collection, it is easy to identify the un-assessed properties, non-issue of demand notices and defaulters.

20. Since use of the properties is also shown it is easy to fix up the valuation of the property and also to find out the deviation or irregularity in the assessment of the property.

21. In view of the spatial location of the property is known, it is easy to identify the importance of the location vis-a-vis the determination of the rate of the tax to be fixed.

22. It is easy to bring in the transparency in tax assessment and collection and also among the staff and also the citizens.

5. RECOMMENDATIONS:

1. A comprehensive and integrated **Urban Management Plan (UMP)** integrated with GIS has become important and crucial for efficient, economic, meaningful and people-friendly Municipal Administration.

2. An Integrated **Urban Management Plan (UMP)** is needed in an Urban Local Body to provide for such an exchange of data that will not only guarantee rapid access to data whenever and where ever required but also prevent detrimental duplications and degradation of the system. This will help to achieve the goal of e-administration of all the components of the ULB.

3. The system should be based on the principle that a data set should be stored and maintained within the department where expertise for that type of data is available but be freely and easily available for all the other departments that require this type of data.

4. The system should not be an isolated or separate unit but integrated and implemented into all the departments and operated by the people those need and use the Urban Information.

5. Property identification code / House Numbering System shall be introduced to introduce a unique code which would identify the property and this should be used by all the departments and other Government Departments, so that it would be useful to identify each property in the city.

6. Self-assessment (SA) shall be made statutory and submission of wrong particulars for assessing the property tax shall attract penalty.

7. The SA application shall be in simple format and ordinary citizen shall easily understand the method of calculation.

8. Spatial data through GIS application shall be utilized for accurate and correct assessment.

9. The Collection of property tax shall be through e-seva, banks and on-line only and field collections (personal contact) shall be banned.

10. The staff shall be given training to use the GIS application for verification of the collection, reassessment, usage of the building etc.

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11. All the previous property tax records shall be computerized and the GIS database shall be regularly updated.

12. Special teams shall be constituted to survey and assess the properties. The correct plans shall be prepared on CAD or similar application so as to know the plinth area, floor area and usage of the building so that the assessment can be done automatically.

13. All the building applications shall be submitted along with CAD drawing and after the approval is accorded the GIS database shall be updated instantly, so that the same can be used for assessment of tax and also to check unauthorised deviations to the approved plans.

14. The entire GIS database shall be placed on the web facilitating the citizens to browse the data pertaining to the plinth area, floor area, property tax – paid, balance etc.

15. The availability of data and maps are needed in the formation and maintenance of roads. In number of instances the data collection, storing and retrieval of the data of roads are time taking, cumbersome and incomplete. GIS application solves all these problems. The data including maps shall be regularly updated.

16. GIS database for manholes, street lighting, potholes, works done, scheduling, etc has to be built and used. GIS application is of a major help in storing and retrieving the data of details, which are underground such as pipelines, drains with their dimensions.

17. In the formation of new roads and to study their impact can also be done through GIS application.

18. The present grievance redressal mechanism shall be linked to the road inventory and shall be used after analyzing the same on the GIS application. The data shall be accessible to all the staff members so that the redressal mechanism will be instant and monitoring will be simple.

19. The GIS maps help to identify the areas based on the quantity of garbage generated and problem areas can be identified and monitoring can be done effectively.

20. Garbage disposal can be streamlined with the GIS database. Optimal routing of the vehicles is possible through GIS.

21. No. of trips of each garbage lifting vehicle can be easily monitored through GIS maps and by instant forwarding of the data through handsets with the staff.

22. Web based GIS application in urban administration shall be made mandatory for effective governance and shall be a pre-requisite qualification for making the **Urban Management Plan** eligible for any financial assistance from the government.

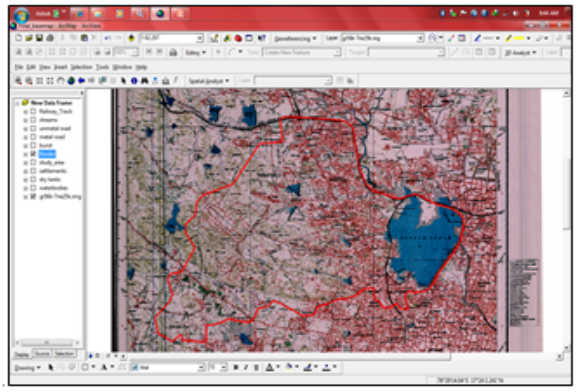
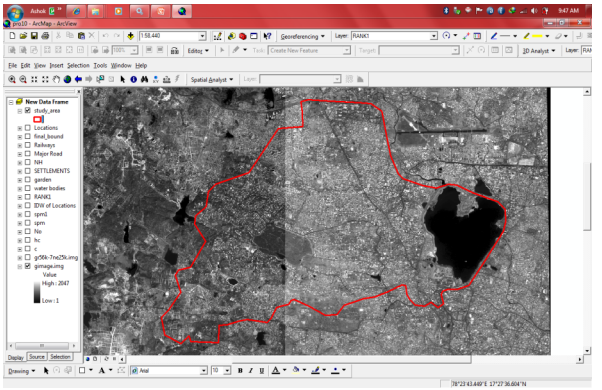
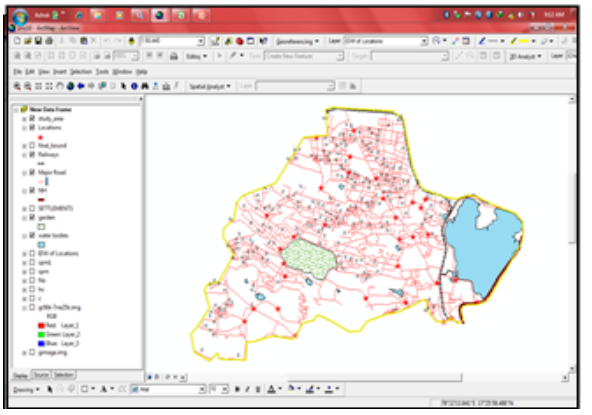


FIGURE 1.1: SHOWING CIRCLE-V RASTER AND VECTOR FORMATS USING ARCGIS SOFTWARE





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