CHAPTER 7

SUMMARY

(7.0) Summary:

Developing Vadodara city as an Eco-city will help in decreasing environmental stress, improving living conditions and in achieving sustainable development through a comprehensive urban improvement system. It will involve planning and management of land and its resources. Implementation of environmental improvement measures will be proved as major step in eco-city development. It will bring reduction because of incorporation of environmental considerations into plans (Master Plans). Eco-city construction will pursue the beautification of natural environment and also achieve development of the green environment by means of increasing the amount of green belts, trees and gardens. The aim of the present study was to identify the potential sites for urban green space development and updating of various resources which will help in their sustainable utilization in future. Application of remote sensing and Geographical Information System (GIS) aided in identifying these sites and in preparation of Eco-city/Eco-ward plan.

RS-GIS facilitated the most crucial information for preparing a plan which was an accurate and updated base map of the city. They helped in updating the maps of road networks, spatial extent of development and the information on the use of each parcel of land. GIS supported both spatial and non-spatial attributes. It integrated all this information in the single system by putting maps and other kinds of spatial information in digital forms. It combined both representational techniques and analytical techniques which helped decision making for systematic planning and maintenance. In present study use of RS-GIS was a novel approach for generation of Eco-ward plan. Over and above all the utility of advance tools of remote sensing and GIS aided in making the

developmental plan and facilitated updating, retrieval and analyzing urban related resources.

Various findings related to studies are as followed:

1. For the generation of Eco-city plan various thematic maps based on various themes were prepared which helped in analyzing the present status of various resources.
2. The study also updated the transportation map and water body map for Vadodara city.
3. Thematic maps showing the location of various Gardens and Greenbelts of the city helped in analyzing their distribution in the city.
4. Slope map and contour map generated for the city helped in land suitability analysis of the city. These maps will also help in generation of flood prone areas of the city.
5. The study delineated land use changes occurred over 129 years at two i.e., Vadodara Urban Development Authority (VUDA) and Vadodara Municipal Seva Sadan (VMSS) level. VUDA includes Vadodara city and adjoining village areas like while VMSS includes Vadodara city only. The results revealed that the Vadodara city is expanding very rapidly.
6. The land use change analysis revealed that urban area of the city has expanded from 9.14 km^2 in the year 1880 to 145 km^2 in the year 2009 at VMSS level. Such high rate of urbanization has occurred at the expense of various resources like waterbody, vegetation and agriculture.

7. This fact was proved by the rapid decrease in the area occupied by agriculture fields. The area under agriculture reduced very rapidly from 704.85 km^2 to 573.1 km^2 at VUDA level. Such rapid decreases will not only implication on economy of the city but also on the environment.
8. Many water bodies of the city like Gorwa Pond, Gotri Pond, Harni Pond, etc. have shown decrease in area occupied by them resulting into water scarcity in those areas. Many wetlands of the city have disappeared over a period of time due to the rapid urbanization. Study also revealed that some of the water bodies of the city are facing the problem of eutrophication.
9. Rapid increase in the road length has been observed which has led to increase in the traffic volume resulting into the increased level of pollution. This will help in optimizing the demand for roads.
10. Study also examined the type of the urban sprawl by estimating the entropy of the Vadodara city. High entropy value showed that growth of the city is not uniform and the development of the city is of dispersed type.
11. Estimation of Urban Sprawl Index (U.S.I), Land Consumption Rate (L.C.R.) and Land absorption Coefficient (L.A.C.) revealed that increased population rate is responsible for rapid sprawl of the city.
12. Status of Vegetation mapped for three different years i.e., 2000, 2007 and 2009 showed the distinct decreasing trend in vegetation. These findings will help in formulating the policies for conserving the vegetation of the city.
13. The study also highlighted constant decrease in per capita vegetation of the city from the year 2000 to 2009.

14. Estimation of Land Surface Temperature (LST) showed that the vegetation and temperature are correlated negatively with each other. This fact was proved by the lower temperatures of the area with vegetation.
15. Estimation of LST revealed that the nature of temperature variation may lead to the formation of Urban Heat Island (UHI) in the city.
16. Urban green space (UGS) suitability helped in identifying various potential sites for Vadodara city. This results if implemented will help in improving the vegetation status of the city.
17. Land suitability analysis (LSA) carried out for three different wards played a key role in generating the Eco-ward plan of three selected wards of Vadodara city.
18. Survey carried out for the city revealed perspective of citizens for the city. Many participants felt that more gardens and parks should be developed in the city. Also there is a need to improve the transportation system along with development of more flyovers and bridges.
19. The study provided Eco-ward plans for development of three different wards which will help in sustainable development of these wards.
20. Eco-ward plans will not only improve the living standards of the citizens but will also help in decreasing the environmental stress caused by different anthropogenic activities.