

**DEVELOPMENT AND ENHANCEMENT OF URBAN AND SUB-URBAN
ENVIRONMENTS USING SPACE BORNE DATA
(A Case Study)**

H.S. MEHTA

Professor of Civil Engineering and Incharge
Remote Sensing Cell, G.S.I.T.S., Indore-3 (M.P.) INDIA

R.S. SIDHU & BHUPESH SAKALLEY

Resource Scientist, M.P. Council of Science & Technology
Remote Sensing Centre, Bhopal (M.P.) INDIA

ABSTRACT

In the recent years, the nationwide phenomenon of conservation of forests/green spaces has come into light. The green cover of the land is being destroyed at an alarming rate, and the living environment of the urban areas is deteriorated along with the development and expansion of cities. Within the urban areas green space/parks usually form the transitional environments between nature and the country side on one hand and cities on the other. As these green spaces/parks mature their beneficial effect becomes greater. Thus increasing the value of green spaces, with the age involves not only the aesthetic values but also their effectiveness in the enhancement and environmental control. For the sustained supply of the enhanced environment for the futuristic demands of mankind has made the planners conscious for the planned utilization and development of limited natural resources. This requires a detailed understanding of resources available with respect to their quality, quantity and distribution, so as to strike a balance between the exploitation and regeneration process which ensures the preservation of healthy environment. Along with the rapid advancement of urbanization and deterioration of living environments in the study area, there has arisen a strong voice to seek a comfortable and well off living standards in the urban environments. Under such circumstances it is considered urgent to conserve and produce better environments by enhancing the recognition of Green belts, green spaces, parks in and around the urban and sub-urban areas. In proceeding with the maintenance and conservation of urban and sub-urban environment, it is necessary to grasp the actual state of green cover/space over a wide area with a consistent accuracy from a uniform view point for environmental control. Hence, in suggesting the enhancement and development of environmental structure of urban and sub-urban areas, Authors have emphasised the method of environmental control with green belts, spaces, parks etc. by using different forms of space borne data, in the form of Landsat TM (F.C.C.), IRS-1A-LISS II (F.C.C.) and spot-1. Statistical analysis has also been worked.

KEY WORDS : Image Interpretation, Landsat, Remote Sensing, Renewable Resource, SPOT, Thematic.

INTRODUCTION

The value of green areas in the urban and sub-urban environment has been recognized by many official bodies in recent years. Local authorities are aware of the role they play to ensure in Urban planning and land management decisions. Recently more attention has been given for the enhancement or creation of semi natural open spaces to benefit urban-sub urban residential population. However, semi natural open spaces is only one of the competing land uses in the urban environment and, therefore, a compromise will always have to be made between the demand for green areas and the demand for development.

Study area

The area selected for study, is Bhopal city, Capital of Madhya Pradesh State of India, lies between the co-ordinates :

23° - 10'N to 23° - 20'N
77° - 10'E to 77° - 30'E

The study area is divided into three parts locally known as New Bhopal, Old Bhopal and Bharat Heavy Electricals Ltd., (BHEL) area. Out of these three, Old Bhopal is densely populated

and vegetation cover is almost Nil, while in New Bhopal the development is planned but due to high rate of migration the growth is uncontrolled. BHEL area is still ecologically protected and the ratio of vegetation cover with population is high in comparison to New Bhopal and Old Bhopal.

Data set used

- (1) the topographic maps of survey of India prepared on 1:50,000 scale, used in preparation of Base map of the study area.
- (2) Landsat TM data of 1985 and 1987, used to identify the vegetal cover in the study area.
- (3) Spot data of 1990, used in mapping of vegetal cover in the study area.
- (4) IRS-1A LISS-II data of 1992, used in vegetal cover mapping.

METHODOLOGY

Standard visual interpretation technique for identifying different landuse features on the basis of image interpretation elements, have been used to map the vegetation cover in urban and sub-urban areas. Different optical

instrument like Pentagraph, Optical reflecting projector, Procom-3 have been used to map the vegetation cover and its transformation to base maps. Area calculation was being made by using Placom planimeter.

RESULT AND DISCUSSION

Multidate Remotely sensed data from different satellites have been used in mapping the vegetation cover in urban and sub-urban area of Bhopal and BHEL. Vegetation cover map from various sources indicates the ecological and environmental balance maintained in urban and sub-urban environment as shown in Plate 1,2,3 & 4). With the statistical analysis it is clear that the ratio of vegetation cover with settlement is high in BHEL area then the others as shown in Table-1. It is also observed that in peak summer the average temperature of BHEL premises is comparatively lower than the densely populated urban area of Bhopal.

Table - 1 : Statistical Analysis

S. No.	Year	Type of Data	Vegetation cover in Hect	
			BHEL Area	New & Old Bhopal
1.	1985	Landsat TM	150	15
2.	1987	Landsat TM	285	85
3.	1990	SPOT	600	175
4.	1992	IRS-1A	750	265

Total Area of BHEL = 3000 Hect.

Total Area of Old + New Bhopal = 18000 Hect.

In 1980's the BHEL area was not having much vegeal cover. The local authorities and decision makers decided the line of action to maintain the environment of BHEL premises. Since then lot of land within the premises has been converted into big parks, artificially created forest, heavy plantation along road sides was made. The effect of all these is clearly visible now on the ground.

In this study authors have made an attempt to setup a relationship between the vegetal cover and urban development of an area.

ACKNOWLEDGMENT

The authors express their deep sense of gratitude to the Director, Shri G.S. Institute of Technology & Science, Indore, India and Director General M.P. Council of Science & Technology, Bhopal, India for providing necessary facilities to carry out this research work.

REFERENCES

Baines L.M. et al. 1986, "The Application of Remote Sensing to Urban Bird Ecology". Symposium on Remote Sensing for Resources Development and Environmental Management. Enchade, The Netherland, 1966, pp. 795-799.

Fosberg R. & Peterkon, 1967, "A Classification of Vegetation for General Purpose", A guide to check sheet for IBP Areas", IBP Hand Book, 4-73-120.

Nature Conservancy Council, 1984, "Urban Nature Conservation".

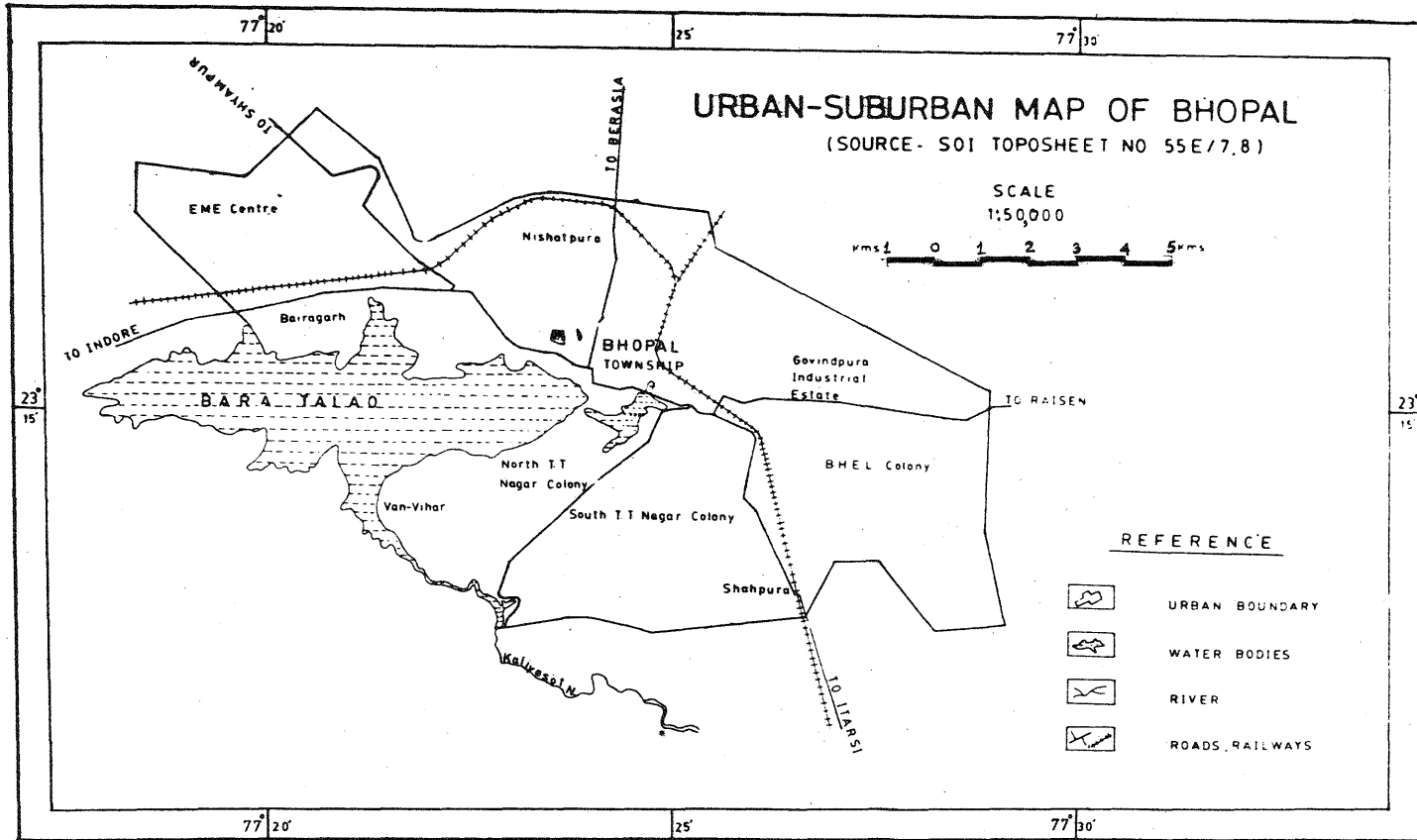


PLATE - 1

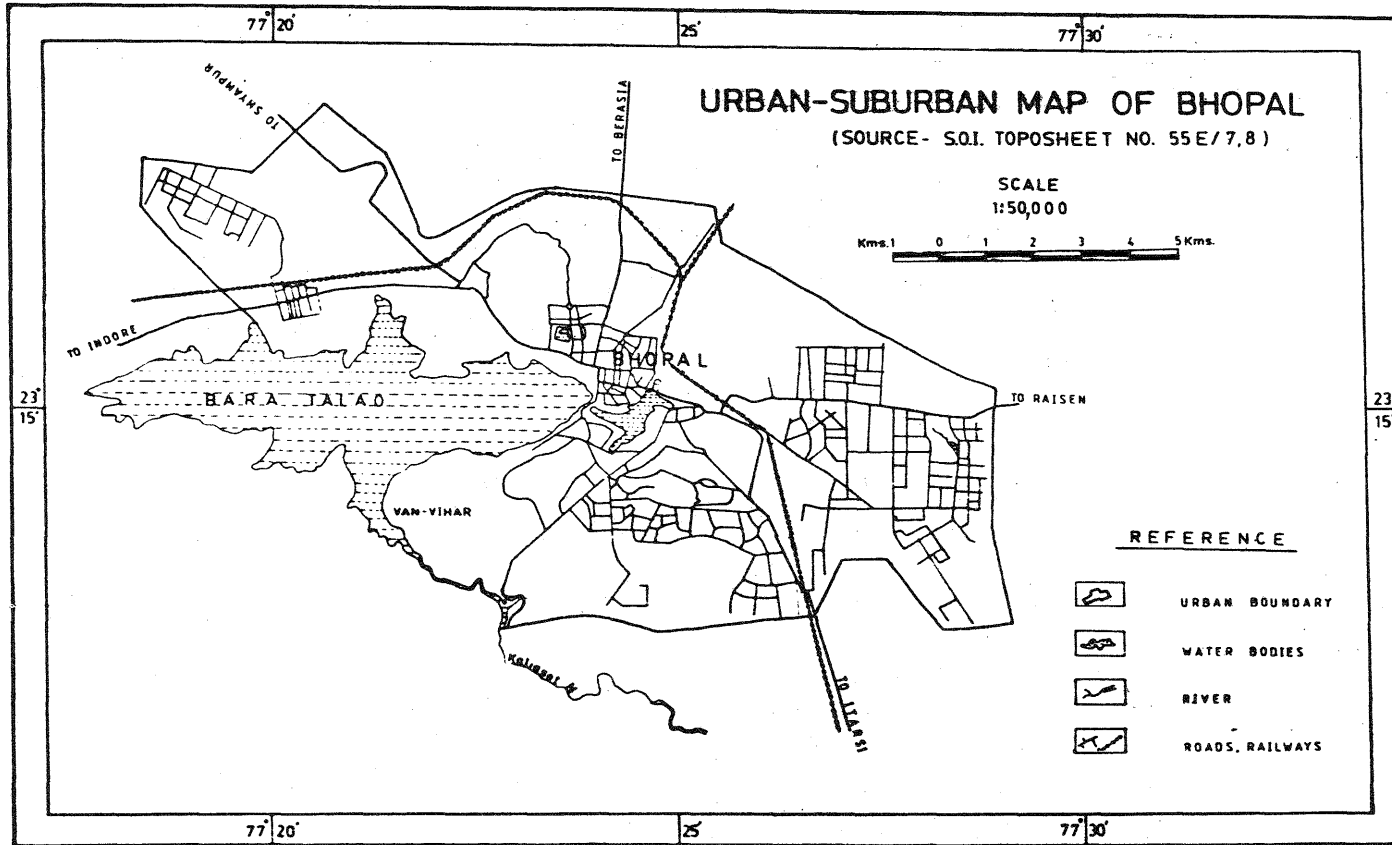


PLATE - 2

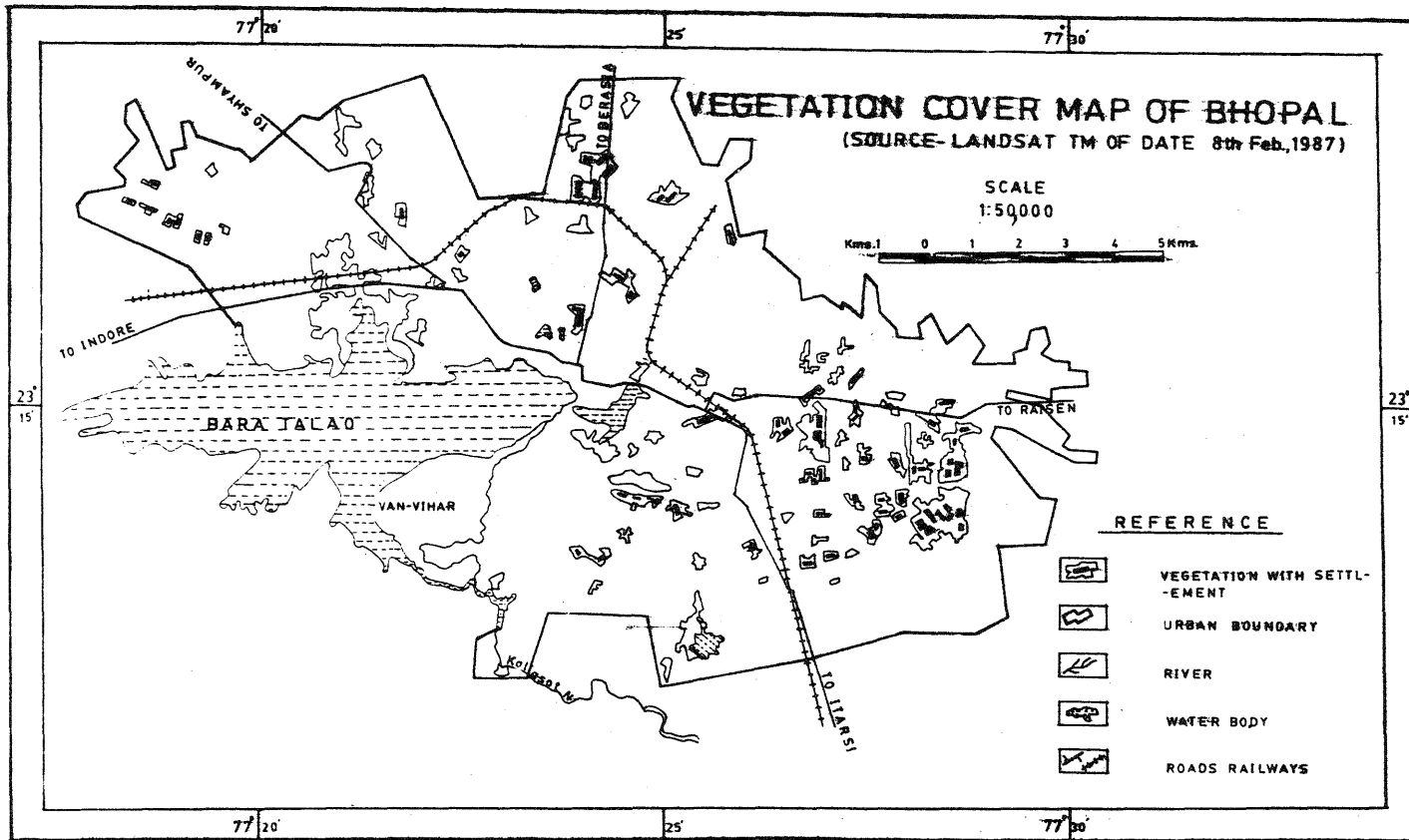


PLATE - 3

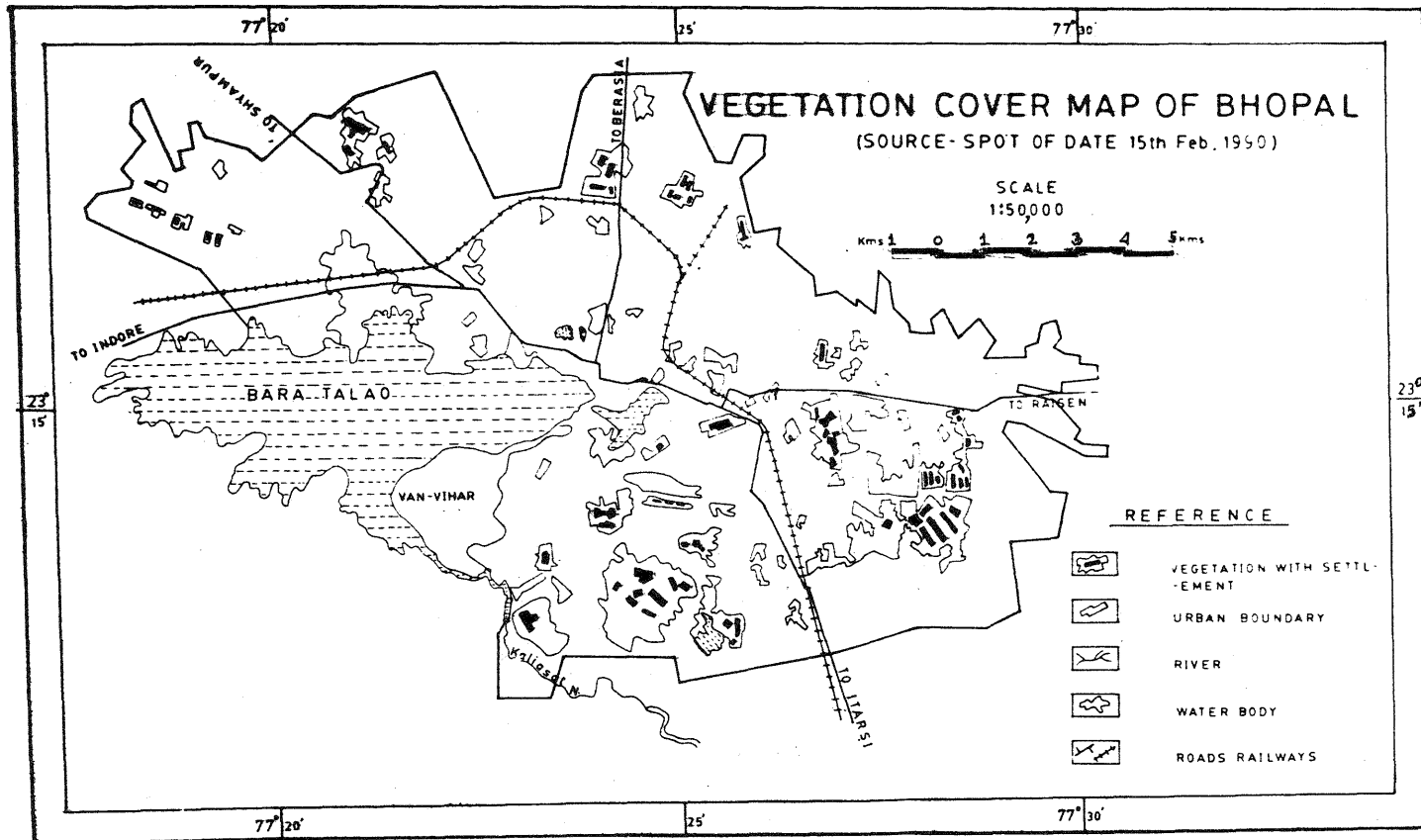


PLATE - 4