

# SOUVENIR

**UGC Sponsored  
National Level Seminar**

On

**Remote Sensing and Geographical  
Information System and  
Its Application in Geography**

8<sup>th</sup> & 9<sup>th</sup> March, 2010



**Organized by**

**Department of Geography**

Matsyodari Shikshan Sanstha's

**Arts, Commerce & Science College,**

Near Motibag Fly Over Bridge, Jalna – 431213 (M.S.)



## National Seminar in Geography - 2010

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The basic function of GPS in the management of forest resource is to acquire the terrestrial information. By manual or computer identification we can extract all kinds of environment information. From the three components, which acquired by the GPS technique, and use this information to build digital terrain model (DTM)? To describe the plane and spatial distribution and we can outguess the terrain and each cross section. GPS is widely used in the calculation of the cubic meter of earth in excavation, road planning, making slope map, and analyzing landform and so on. With computer. It is feasible to use GPS technique for making forestry maps, including forest plane map, forest map, forest site type map and forest soil map, etc...

In spite of all the problems mentioned above we actually do apply GPS in forestry mainly in 3 fields: (1) by consultants while developing forest management plans. (2) Small contractors using hand held receivers to determine their working areas. (3) In the public sector GPS. Has so far been used in research and for surveying in National Parks.

#### CONCLUSION:

The use of GPS in forest and agricultural surveying to determine and locate points in nature, and for their cartographic transferal, is rapidly passing from an experimental phase to an actual operational phase. The level of precision required for this type of surveying can be obtained with easy-to-use, portable instrumentation, on the condition that differential correction is performed on the data.

Some examples of differential GPS post processing applications for dynamic line surveying (forest roads, rural allotment perimeters) are illustrated. Finally, in this way we can use GPS Technique in Forest management.

## “APPLICATION OF GEOINFORMATICS IN THE STUDY OF WATER TANKS: A CASE STUDY OF NORTH BANGLORE TAHSIL, BANGLORE DISTRICT (KARNATAKA)”

Shri. Sardar A. Patil

Dr. N. P. Tendolkar

### 1.0 Introduction

Water is the basic necessity for the survival of human as well as animals and plants. It is needed for the growth of agricultural products which sustain life on the earth (Gupta & Gupta, 2008). India is a tropical country with a vast diversity of climate, topography and vegetation. Crops cannot, be raised successfully, over the entire land, without providing artificial irrigation of fields (Santosh Kumar Garg, 2007, p.1). India's, approximately 5% net sown area is fed by the tanks. An irrigation tank or tank in India refers to an artificial lake or reservoir of any size. It can also be a natural or spring included as part of a structure. Tanks are part of an ancient tradition of harvesting and preserving the local rainfall and water from streams and rivers for later use, primarily for agriculture and drinking water, but also for sacred bathing and ritual. Often a tank was constructed across a slope so to collect and store water by taking advantage of local mounds and depressions. Tank use is especially critical in parts of South India without perennial rainfall where water supply replenishment is dependent on a cycle of dry seasons alternating with monsoon seasons (Irrigation wikipedia.).

Bangalore has been synonymous with its salubrious climate, due to its position on the Deccan Plateaus as well as its extensive greenery and lakes. Lakes, which have been an inherent part of the ecosystem, also have traditionally served the function of meeting water requirements of the populace, be it for drinking, household uses like washing, for agriculture, fishing and also for religious and cultural purposes. Apart from these functions,

which involve direct use of the lake water, lakes are also known to recharge ground water, canalize water flow to prevent water logging and flooding. These water bodies are also host to a wide variety of flora and fauna, especially birds.

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Given the vast number of lakes in Bangalore, it was imperative that they be maintained on an ongoing basis. This role over a period of time has been being performed by numerous governmental bodies. In Bangalore, bodies such as Forest Department, Minor Irrigations Department, Bangalore Mahanagara Palike, Bangalore Development Authority and Horticulture Department have been responsible for maintenance of various lakes over a period of time (Rohan s D'Souza).

By taking into account significance of this kind of study, the present research paper is related to the **temporal changes in the Distributional Pattern of Tanks**, and for this purpose a new emerging technology i.e. Remote Sensing and GIS is used.

### 2.0 STUDY REGION:

For the present research paper some portion of North Bangalore tahsil is selected as a study region. It is located in between 13°5' and 13°15' N latitude and 77°30' and 77°45' E longitude

### 3.0 OBJECTIVES:

The major objectives of the present research paper are as given below.

- 1 To analyze distributional pattern of tanks in the study region.
- 2 To study temporal changes in the distributional pattern of tank.
- 3 To suggest comprehensive plan for the sustainable development of tanks.

## 4.0 DATA SOURCE AND METHODOLOGY:

### 4.1 Methods of data collection:

The present research paper is entirely based on the secondary data. Hence, the related data is collected from the toposheet No.57 G/12 and remote sensing data is used in the form of satellite imagery (Jan 2003, LISS 3, IRS 1B). In spite of this, some data has been collected from the books and websites, which are mentioned in the references.

### 4.2 Methods of data Analysis:

In the present research project GIS technique is used for the analysis of data. By using ERDAS software Geo referencing of toposheet and imagery has done. Firstly Geo referencing of toposheet is done and later imagery is Geo referenced in image to image registration. Toposheet and imagery are digitized by using Arc GIS 9.2 version and for the measurement of area, attribute data is exported to excel. After digitization overlay analysis technique is used for the study of temporal changes in the area of the tanks. Results of the overlay analysis are presented in the form of maps.

## 5.0 DISTRIBUTION OF TANKS:

It is clear from the Figure No. 1.0, 1.1, 1.2 in the year 1978, there were 145 tanks were present in the study region. Total area of those tanks was 238.109 sq. km.s. In the year 2003 number of tanks was 103 and the area covered by those tanks was 153.465 sq.km.s.

## 6.0 TEMPORAL CHANGES IN THE DISTRIBUTIONAL PATTERN OF TANKS:

In the year 1978 there was 57 lakes which having area less than .5 sq km. While in the year 2003 No. of lakes having less than .5 sq km area decreased to 37. The lakes which having area between 0.5 sq. Km and 1 sq. Km was 35 in 1978 and it decreased to 27 in 2003. In 1978 23 lakes had area between 1-2 sq. Kms while it decreased to 16 lakes. No. of lakes which had more than 9 sq. Kms. area was 04 in 1978 while No. of lakes decreased to 01 (Table I, Figure 1.0, 1.1 1.2).



Table No. I  
**THE NORTH BANGLORE TAHSIL**  
**THE DISTRIBUTIONAL PATTERN OF LAKE**  
 (1978 & 2003)

Sr. No.	Range of Area	No. of Lakes		Absolute Change In No. of Lakes
		1978	2003	
1	< .5 Sq. Km.	57	37	-20
2	.5 - 1 Sq. Km.	35	27	-08
3	1 - 2 Sq. Km	23	16	-7
4	2 - 3 Sq. Km	10	06	-04
5	3 - 6 Sq. Km	08	11	+03
6	6 - 9 Sq. Km	08	05	05
7	> 9 Sq. Km	04	01	03
8	TOTAL	145	103	42

Source: Computed by the Author.



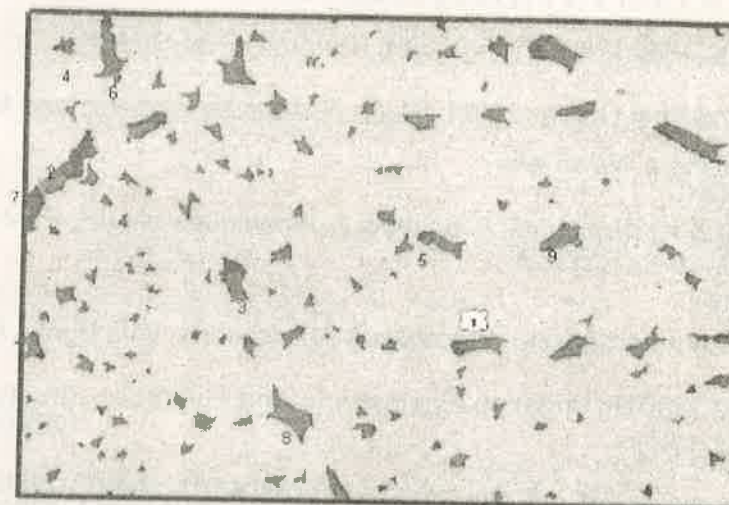
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THE NORTH BANGLORE TAHSIL  
 DISTRIBUTION OF TANKS  
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 8 Bharasandrapalya  
 9 Doda Tankar

**4.0 Conclusion and Suggestions:**

It is clear from the table No. I and the Figure No.s 1.0, 1.1, & 1.2 the area and absolute no. of tanks are decreased in the given period of time. This occurred due to the man's intervention in the tanks. Tanks are the life lines of the peninsular India that's why there is special need of its conservation. Following steps may help to the conservation of the tanks of the study region.

- To check man's intervention in to the tanks.
- To create awareness among the peoples.
- To prepare a law regarding the conservation of the tanks.

4. To check siltation in the tanks and for that purpose avoid deforestation and do reforestation in the catchments area of the tanks.

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**AWARENESS of GEOGRAPHIC INFORMATION SYSTEM AND APPLICATION IN GEOGRAPHY**

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**Definitions:**

**Ron Abler (1988):** GISs are simultaneously the telescope, the microscope, the computer, and the Xerox machine of regional analysis and synthesis of spatial data.

**Peter Burrough (1986):** GIS is a powerful set of tools for storing & retrieving at will, transforming & displaying spatial data from the real world for a particular set of purposes. Toolbox

**Clarke (1995):** GISs are automated systems for the capture, storage, retrieval, analysis & display of spatial data.

**Jack Estes & Jeffrey Star (1990):** An information system that is designed to work with data referenced by spatial or geographic coordinates. In other words, a GIS is both database system with specific capabilities for spatially referenced data, as well as a set of operations for working with the data.

This means that a GIS collects data, sifts & sorts them, & selects & rebuilds them to find the right information to answer a question.

**Dueker (1979):** A GIS is a special case of information systems where the database consists of observations an spatially distributed features, activities or events, which are