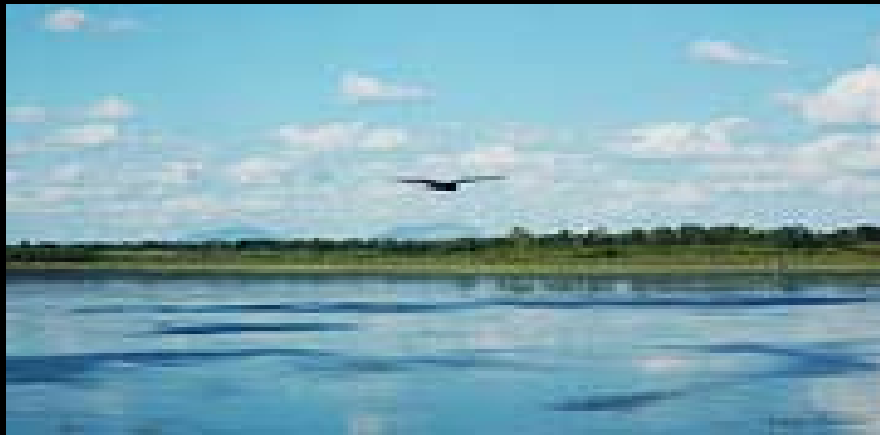


Historical Evolution of Tank System in Bangalore City



Fathima Samana S

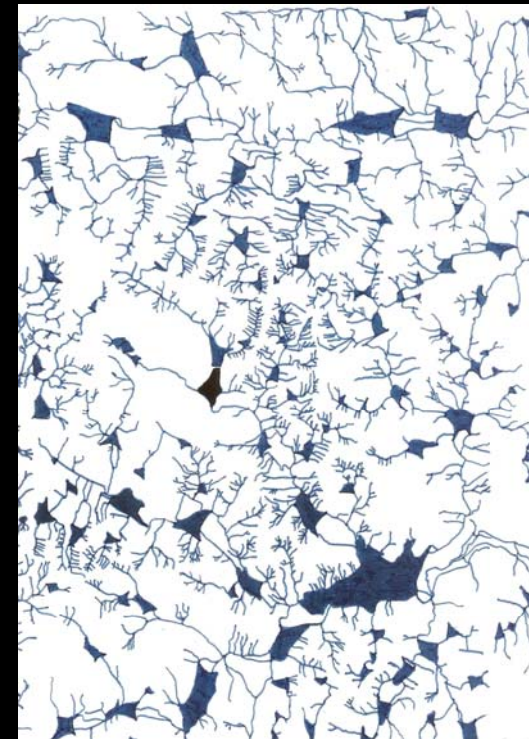
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CONTENTS OF THE PAPER

- ❑ INTRODUCTION
 - ❑ Problem definition & Aim of the study
 - ❑ Relation between water and settlements
- ❑ MAIN CONTENTS OF THE STUDY
 - ❑ Arkavathi/ Pinakini River Basin
 - ❑ System of Water tanks in Bangalore city
 - ❑ Context of Bangalore
 - ❑ Principle of working
 - ❑ Evolution of the system
 - ❑ Planning Parameters
 - ❑ Role of tanks in Bangalore
- ❑ INFERENCE
- ❑ BIBILIOGRAPHY



Water network, Bangalore.

INTRODUCTION

DEFINING THE PROBLEM

- ❑ HISTORICAL PARADIGM: Water is considered a source;
 - ❑ To sustain life
 - ❑ To nurture occupations
 - ❑ To support religious beliefs
- ❑ PRESENT SHIFT IN PARADIGM: With urbanization process;
 - ❑ Negation of sensitive water layer → urban ecological imbalance
pollution
unhygienic conditions along water
floods during rains in the cities
 - ❑ Trends of present development → increased demand for land
encroachment upon tank beds
disposition of sewage into water-bodies

INTRODUCTION

AIM OF THE STUDY

- ❑ To explain the principle of working of the tank system
- ❑ To understand the evolution of tank system, with respect to the growth of the city
- ❑ To acknowledge the topography of Bangalore
- ❑ To analyze the planning principles, along water network
- ❑ To emphasize on the relationship between the system of tanks & Bangalore city
- ❑ To realize that the water network is a structuring element & unique asset, to the city of Bangalore



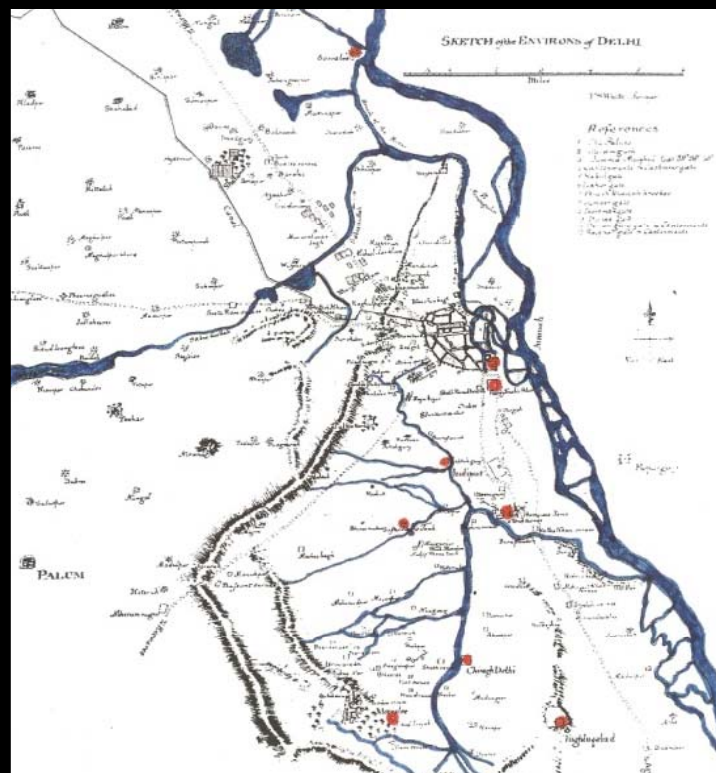
Tank system, Bangalore.

INTRODUCTION

RELATION BETWEEN WATER & SETTLEMENTS

SETTLEMENTS ALONG WATER BODIES:

- ❑ Based on the nature of the water body:
 - ❑ Coastal cities → along ocean/ sea coast
 - ❑ River cities → along delta/ river beds
 - ❑ Lake cities → along a lake/ with a system of lakes
- ❑ Based on the occupation of the settlement:
 - ❑ Trade cities/ Harbours/ Port cities
 - ❑ Agricultural cities
 - ❑ Administrative capitals
 - ❑ Religious/ pilgrimage centers
 - ❑ Recreational towns



Yamuna river basin, North India.

MAIN CONTENTS OF THE STUDY

ARKAVATHI/ PINAKINI RIVER BASIN

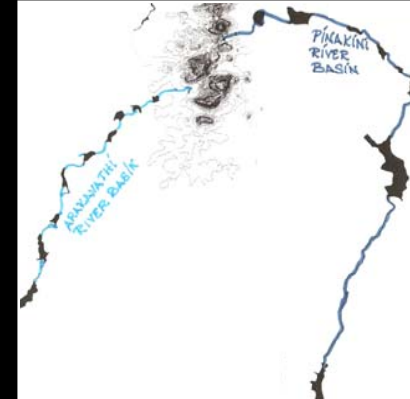
- ❑ Located in the Deccan Plateau
- ❑ Nandi-hills – apex of the ridge
- ❑ Main ridge-line (North-west – South-east) divides the region into 2 river basins
 - ❑ Arkavathi River Basin (west) – steep slope & undulating terrain
 - ❑ Pinakini River Basin (east) – gentle slopes & valleys



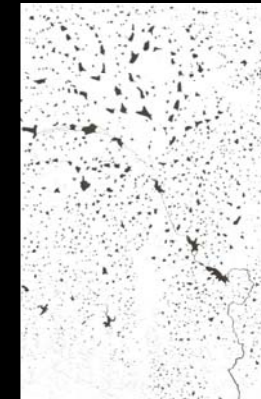
South Indian
Peninsula.



Cauvery River Basin.



Arkavathi & Pinakini
River Basin.



Region of
1000 tanks.

MAIN CONTENTS OF THE STUDY

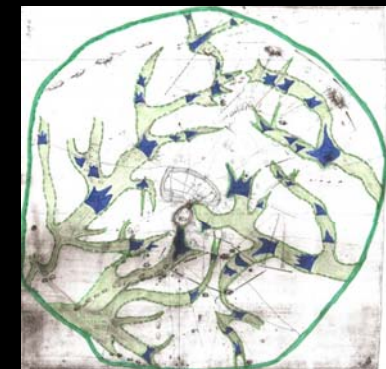
SYSTEM OF WATER TANKS IN BANGALORE

CONTEXT OF BANGALORE:

- ❑ Radial topography pattern
 - ❑ Apex of the ridge – High Grounds
- ❑ 3 Valley systems draining the city:
 - ❑ Vrishbhavathi – South-west
 - ❑ Hebbal – North-east
 - ❑ Challaghatta – South-east



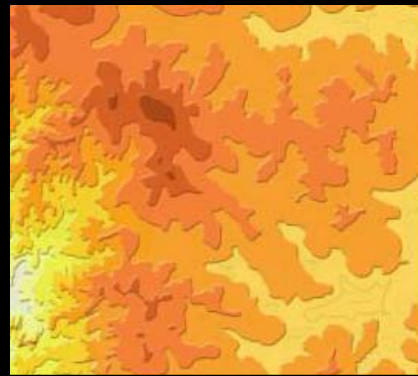
Valley Systems.



Drainage pattern.



Location.



Contour Map.

- ❑ Tanks constructed, identifying the natural valley systems in the region
- ❑ Nalas (valleys) fed the tanks with surface run-off water, during rains
- ❑ Tanks provided water for drinking & agriculture, during lean periods

MAIN CONTENTS OF THE STUDY

SYSTEM OF WATER TANKS IN BANGALORE

WORKING PRINCIPLE OF TANK SYSTEM:

- ❑ Tank System worked on the “Principle of Cascading”
- ❑ Principle of cascading:
 - ❑ Tanks, situated in the same catchment area, formed chains
 - ❑ Tanks depended on surplus water from the tanks at higher elevation & the run-off from their own catchment
- ❑ Tank system of Bangalore, drained the city effectively & prevented flooding within the city



Water Tank System of Bangalore.



Principle of Cascading, on which the System of tanks in Bangalore City work.

MAIN CONTENTS OF THE STUDY

SYSTEM OF WATER TANKS IN BANGALORE

EVOLUTION OF THE TANK SYSTEM

I. PRE-COLONIAL PERIOD:

- ❑ Kempambuddhi tank (Basavanagudi), Dharmambuddhi tank (Gandhinagar), Halsoor tank (Shivajinagar), Sampangi tank (Corporation) & Siddikatte tank (Kalasipalyam), by Kempegowda-I & II (1537 onwards), for agricultural and domestic needs.
 - ❑ Ridge (land at higher elevation) → Settlements
 - ❑ Valleys (low-lying lands) → Water Tanks
- ❑ Lal-bagh and its tank, by Haider Ali & Tipu Sultan (1759)
 - ❑ Gardens & green spaces along valleys & low-lying areas
 - ❑ Tank & its precincts → recreational spaces

MAIN CONTENTS OF THE STUDY

SYSTEM OF WATER TANKS IN BANGALORE

EVOLUTION OF THE TANK SYSTEM

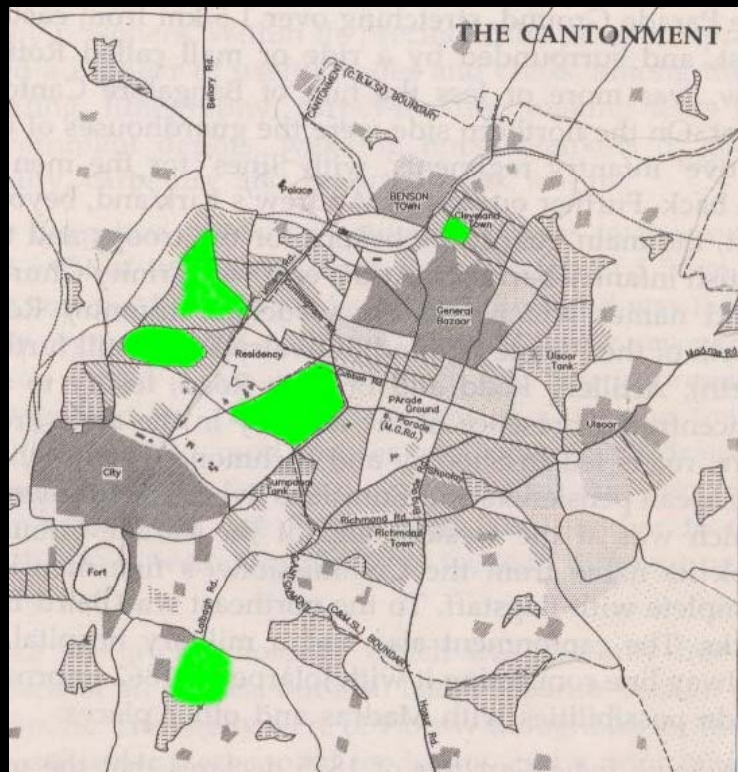
II. COLONIAL PERIOD:

- ❑ Cantonment established in the gentle slopes of Pinakini River Basin
 - ❑ Ridge → High Grounds – green with Golf Course, Race Course, Cubbon Park, etc.
 - ❑ Valleys → Water Tanks
- ❑ Bangalore → “Garden City”
 - ❑ Developed existing tank – Ulsoor tank, to cater to the cantonment (1809)
 - ❑ Constructed new tanks – Millers tank (1873), Sankey tank (1882), Hesaraghatta tank (1896), to supply piped water to the ever-growing cantonment city.
 - ❑ Concept of out-door recreational spaces – golf course, parks, polo clubs, turf clubs, etc.
 - ❑ “Karanji System” – A system of supplying water in the fort area (1870’s), where a “water-bearer” with tanned skin-container supplied life-saving water, drawn from kalyanis/ tanks.
 - ❑ “Inter-linking System” – tanks linked to one-another by a system of water channels (nalas), which feed the tanks at lower level, with the water overflowing from tanks at higher level

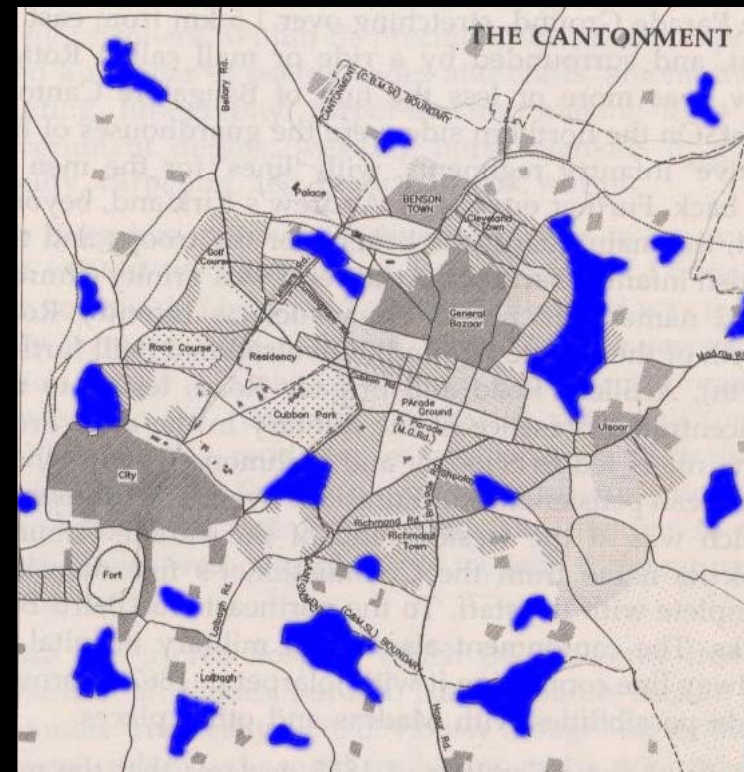
MAIN CONTENTS OF THE STUDY

SYSTEM OF WATER TANKS IN BANGALORE

EVOLUTION OF THE TANK SYSTEM – COLONIAL PERIOD



Map of parks & open spaces, Bangalore.



Map of water tanks, Bangalore.

MAIN CONTENTS OF THE STUDY

SYSTEM OF WATER TANKS IN BANGALORE

EVOLUTION OF THE TANK SYSTEM

III. PRE-INDEPENDENCE PERIOD:

- ❑ Piped water supply to the city → neglect of water tanks
 - ❑ Tanks – isolated as traffic islands, with roads on all sides
 - ❑ Both sewer lines storm water drains ran along the natural valleys
 - ❑ Seasonal storm water drains → perennial sewage channels
 - ❑ Hesraghatta reservoir dried up completely.
 - ❑ City's water supply was restored by constructing a dam across Arkavathi at Tippegondanahalli (1925)
 - ❑ Encroachment of tank-beds → growing city, with increasing density
 - ❑ Recreational spaces → parts of Ulsoor tank & Domlur tank
Dharmambuddi, Shule & Sampangi tank
 - ❑ Vegetable garden → Koramangala tank

MAIN CONTENTS OF THE STUDY

SYSTEM OF WATER TANKS IN BANGALORE

EVOLUTION OF THE TANK SYSTEM

III. POST-INDEPENDENCE PERIOD:

❑ Industrialization

- ❑ 5 Satellite towns – H.M.T., H.A.L., I.T.I., Banaswadi & north of Tannery Road
- ❑ Scarcity of water to the growing city, with increasing population
- ❑ B.W.S.S.B. set up, to tap water from Cauvery
- ❑ Alternate employments & reduced dependency on tanks
- ❑ Migration of people into the city → increased demand for land
negligence & encroachment of tanks

❑ Master plan 1965

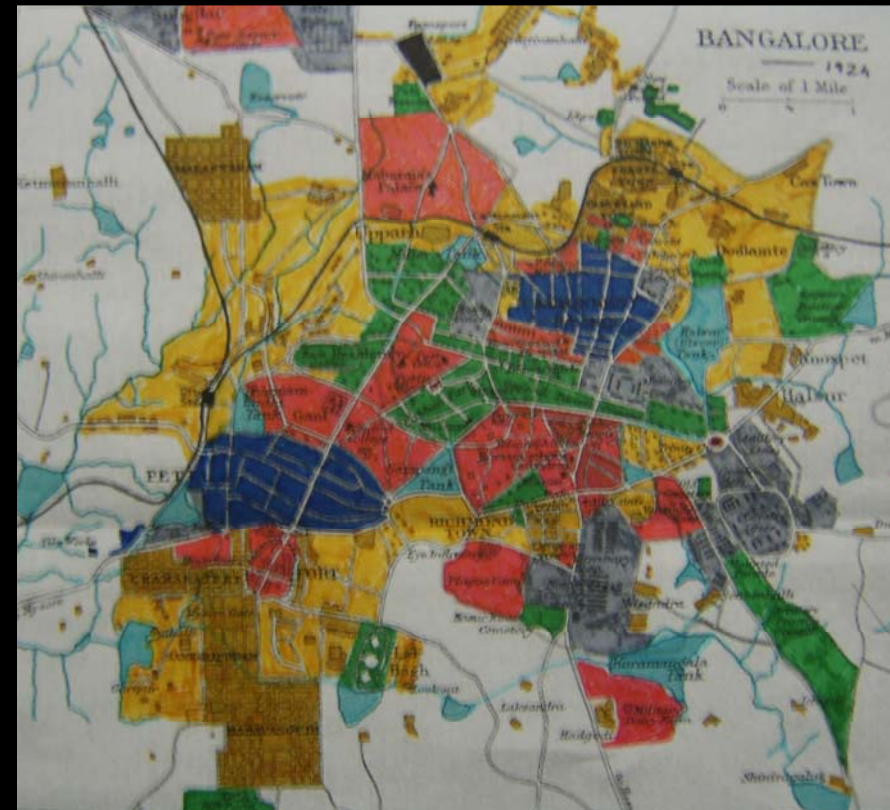
- ❑ Proposal to conserve tanks → Sankey tank, Hebbal tank, Nagawara tank, Challaghatta tank, Bellandur tank, Madiwala tank, Sarakki tank & Kempambuddhi tank

MAIN CONTENTS OF THE STUDY

PLANNING PARAMETERS

LAND-USE:

- ❑ Previously – protect water-shed area, along ridges & valleys
 - ❑ institutions, parks, gardens, etc
- ❑ Presently – encroachment of tank-beds
 - ❑ Residential facilities & slum rehabilitation
 - ❑ Public & private office buildings
 - ❑ Infra-structure & transport terminals
 - ❑ Educational institutes, hospitals, sports stadiums & complexes, community halls & choultries
 - ❑ Markets & industries
 - ❑ Parks & open spaces, exhibition space & demonstration grounds



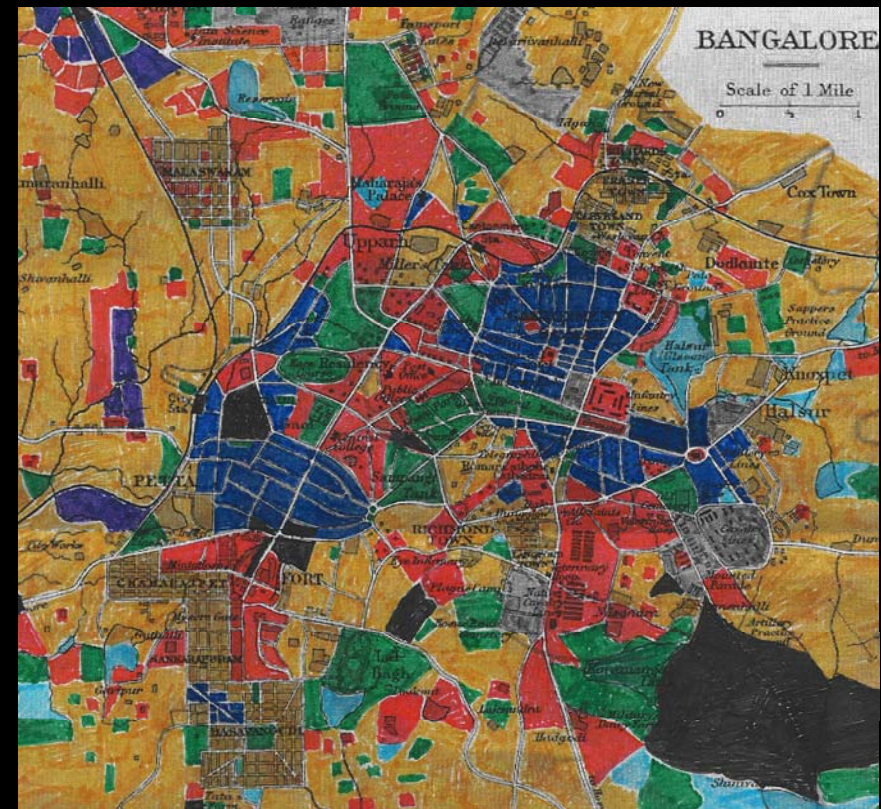
Land use map of Bangalore, 1924AD

MAIN CONTENTS OF THE STUDY

PLANNING PARAMETERS

Tank name	Location	Present land-use
Dharmambuddhi	Gandhinagar	City Bus Station
Karanji tank	Chamarajpet, Gandhi Bazaar, Basavangudi,	Residential layouts, National High School
Sampangi tank	Corporation area	Kanteerava stadium
Millers tank	Vasanthnagar, Shivajinagar	Ambedkar bhavan, IT & office buildings, Jain hospital, marriage halls & Public organizations
Siddikatte tank	Kalasipalyam	K. R. Market
Mathikere tank	Yeshwantpur	Regional park
Binnypet tank	Mysore Road	Residential layouts
Juganhalli tank	Rajajinagar	Residential layouts
Challaghatta	Koramangala	K. G. A. Golf Course
Koramangala	Koramangala	Sports complex

Encroachment of tanks in Bangalore



Present land use map of Bangalore

MAIN CONTENTS OF THE STUDY

ROLE OF TANKS IN BANGALORE

ROLE OF TANKS	FUNCTION OF TANKS	IMPACT OF DISTURBANCE
ECOLOGICAL	Wet-land ecosystems	Ecological imbalance
HYDROLOGICAL	Regulating run-off	Flash floods & soil erosion
CLIMATOLOGICAL	Control surface radiation, humidity, soil moisture, surface & atmospheric temperature	Reduced water-spread area, changing climatic conditions & increase in temperatures.
RECREATIONAL	Parks, gardens, water-sports, boating, bird-watching clubs, etc	Deficiency of recreational & open spaces in cities
RELIGIOUS	Embanked by institutions	Loss of attachment of faith & belief to water
SOCIO-ECONOMICAL	Cultivation, fisheries, recreation, hawking along lake promenades, etc	Generate employment & economy
EDUCATIONAL	Biological study of ecosystems, flora, fauna, water supply, sewage treatment, botanical & horticultural activities in adjacent parks, etc.	Loss of many rare species of organisms, opportunity to understand & respect other aspects of water
INFRA-STRUCTURAL	setting-up of water treatment plants and sewage effluent treatment plant along tanks for re-use the water for landscaping, etc.	Loss of alternate sources of water, lack of recharge points for the under-ground water-table
STRUCTURAL	Structures the city	Disturbs other structuring networks also

MAIN CONTENTS OF THE STUDY

INFERENCE

- ❑ Change in occupations & life style → reduced dependency on tanks
- ❑ Urbanization & present development trends → negation of sensitive water layer
- ❑ Encroachment of tank-beds → provision of infra-structure, housing, services, etc
- ❑ Tanks are integral part of urban landscape → impact environment & climate
- ❑ Lack of understanding → present state of the water network
- ❑ Importance of water-network → efforts to restore & de-silt tanks
- ❑ Holistic approach → understand working & initiate revival of tanks
- ❑ Dependency on network emphasized → change in development attitudes
- ❑ Uniqueness & importance → imbibe sense of pride & responsibility

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