

ARYAN PRESIDENCY SCHOOL



**“CONSERVATION OF LAKES FOR A HEALTHY
BENGALURU”**

AGENDA:

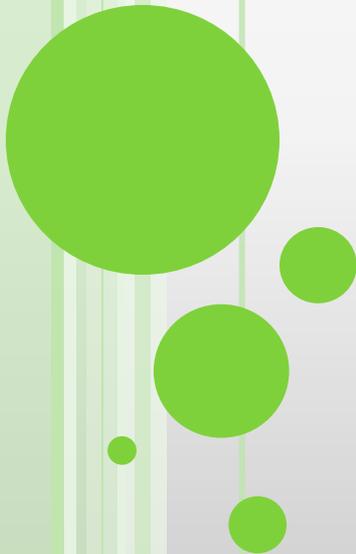
Introduction

Encroachment

Survey on lakes

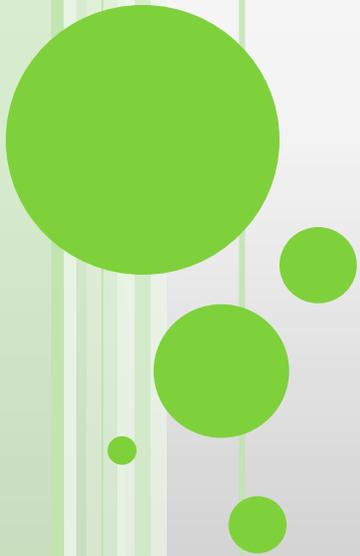
Rejuvenation

Conclusion



VANISHING LAKES:

**A STUDY OF BANGALORE
LAKES**



WHAT IS A LAKE?

Most people would have first hand impression that lake is nothing but a low-lying land that stores water on the land!

Absolutely right, any science definition comes from practice, and the above-mentioned understanding about the lake is from our perceptual knowledge.

The scientific definition is as follows: “A lake is a natural complex composing of lake basin, lake water, and also substance contained in the water (such as minerals, solutes, organic matter and aquatic organisms), which participates in the material and energy cycles of the nature. “

INTRODUCTION TO LAKES OF BENGALURU .

The city of Bengaluru is well known for its lakes and tanks which take care of the drinking water requirements of the city with an average rainfall of 1100 mm . Today, many of the lakes and tanks in the 'IT City' have disappeared and the existing ones are in a highly polluted condition and heavily encroached upon. As a result, the salubrious climate has given way to sultry, stuffy and suffocating climatic conditions with smog, stench and a rise in temperature damaging the environment of the city.

According to a recent report, over the past 5 years. Bengaluru's temperature has risen by at least by 2.5-3 degree(approx)C, both in summer and in winter ,due to the disappearance of lakes and other water bodies.

HISTORY OF BENGALURU LAKES



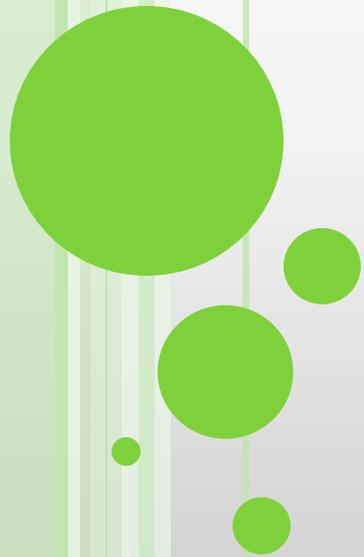
HISTORY OF BENGALURU LAKES.

► *An efficient network of lakes and tanks were built by Sri. Kempe Gowda , who was the founder of Bengaluru city in the 15th century to provide water for drinking, house hold uses, agriculture, fisheries and also for religious and cultural purposes during his time, and also to meet the future growth of the city, as there were no major rivers around Bengaluru. Apart from this , the tanks had been long built with a view to recharge ground water logging and flooding. Some of them were Dharmambudhi ,(supplied drinking water till 1895), Sampangi, Siddikate.*

In 1960's the number of tanks and lakes was 280 and less than 80 in 1993. Until 1895 unfiltered water was supplied from tanks like Dharmambudhi , millers tank Sankey and Ulsoor tanks.

from 1896 water was supplied from Hessarghatta and from 1933 it was also obtained from thippagondanahalli in the 1970's the scheme to pump water from the Kavery river 100 kms away was begun.

SERIES OF LAKES OF BENGALURU



Yellamallappa chetty
Lakes=17
Area covered=979.1ha

Varthur
Lakes=9
Area covered=367.59ha

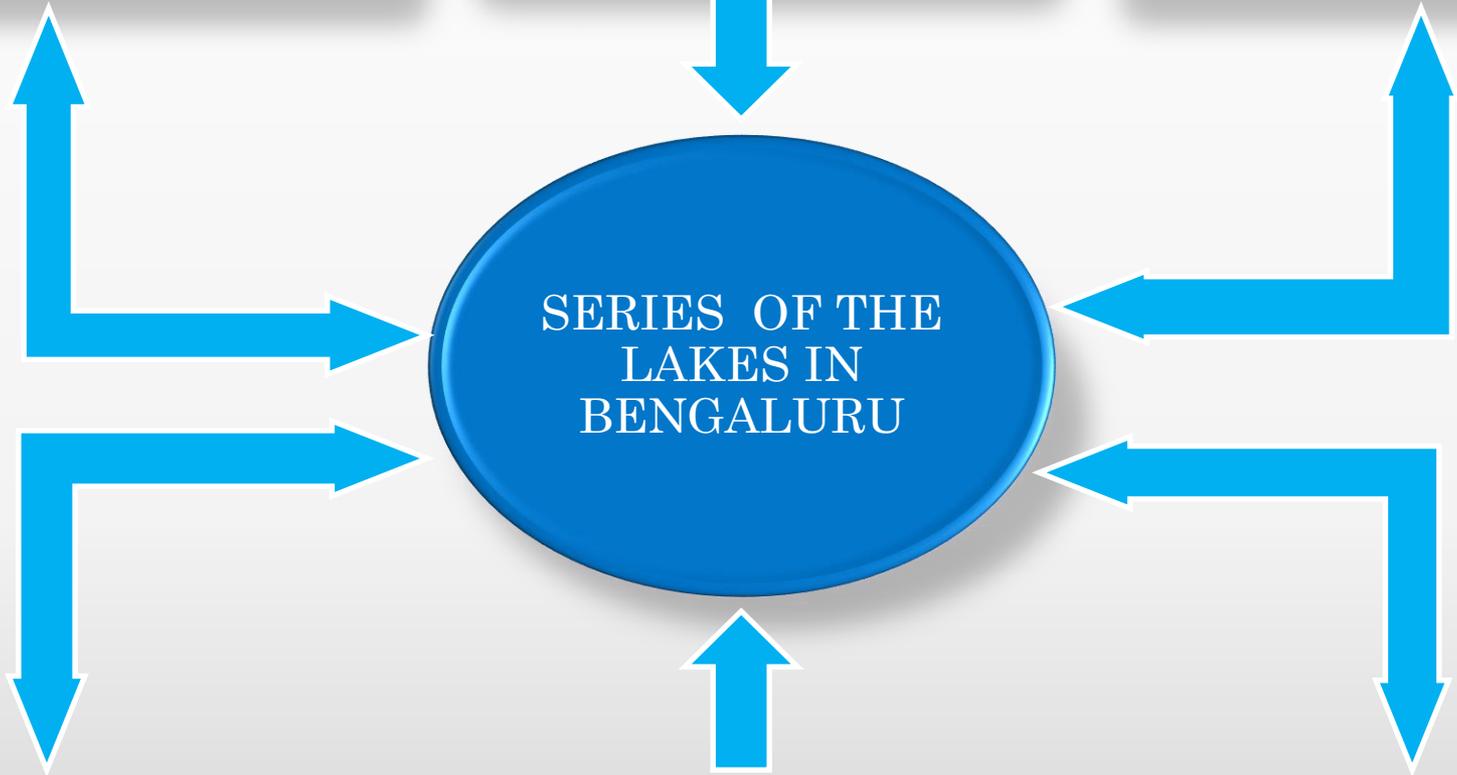
Madavara
Lakes=10
Area covered=222.19ha

**SERIES OF THE
LAKES IN
BENGALURU**

Byramangala
Lakes=11
Area covered=562.97ha

Puttenhalli
Lakes=5
Area covered=57.28ha

Hulimavu
Lakes=8
Area covered=45.84ha



- As per the Minor Irrigation census-1996-1987 of the Department of Minor Irrigation, there were 608 tanks of all size classes in Bengaluru Urban district with a culturable command area of 12, 827 ha (having a command area up to 2000 ha) and gross irrigation potential created of 13004 ha. But, the data provided by the Directorate of Economics and Statistics show that around 652 tanks existed in the same year in Bengaluru Urban District and that they have remained the same to date. The difference in the No. of tanks between these two sources is 50. therefore it is difficult to arrive at any definitive conclusion on the number of lakes / tanks in Bengaluru city.

OWNERSHIP OF THE BENGALURU LAKES.

Prior to the 1986, the lakes in the city were under the jurisdiction of nearly 16 departments. As per the survey in 1986 had identified 81 live and 46 disused tanks. The below table represents the ownership of the lakes.

Sl.no	Name of the agency	Disused lakes	Live lakes	Total lakes
1	Forest Department	28	62	90
2	F.Dand K.S.T.D.C	3	9	12
3	F.Dand K.S.T.D.Cand M.I	-	1	1
4	F.DandBDA	3	3	6
5	F.DandBWSSB	-	4	4
6	F.DandBBMP	1	-	1
7	Government	8	2	10
8	BDA	2	-	2
9	BMP	1	-	1
	Total	46	81	127

BLACK AND WHITE VS. COLOUR

According to Lakshaman Rao Committee report(1986)there were 389 lakes in Bengaluru Metropolitan Area (1279sq km),

Which was under Bengaluru development Authority jurisdiction .

Out of 389 lakes, 262 were in the Green belt area (839.72 sq km),

And remaining 127 lakes were in con urban area(449sq km) out these 81 were live lakes , 79 had a water spread(1079.74ha) and 46 disused tanks .

This shows that the a wide no. of lakes were present around the city with a view to provide irrigation and drinking water to the growing population of Bengaluru city as there were no perennial rivers around the city.

However,Deepa,Ramchandra and Kiran(1996)of the Indian Institute of Science have shown that there were 379 lakes in 2 taluks of Bengaluru district in 1973.Of these, 138 were located in the north and 241 in the south taluk .These came down to 96 in the north (506.87sq km)taluk and150 in the south(594.96 sq km)taluk in 1996, a decline of 35.09 % between 1973 .A recent study by IISc shows that the area of tanks that was 2,342ha in 197came down to 918ha in 2007 with a decline of 60.80%.The proportion of tank area in Bengaluru also came down from 3.40%in 1973 to 1.47 % in 2007.

CURRENT STATUS : “LAKES OF BENGALURU.”

S.No	Current status	No	Of
1	Dried up and leased by the government	13	lakes
2	Sewage water filled and advanced stage of deterioration	60	
3	BDA has breached for forming extensions and creating public utilities and house sites for general public	28	
4	Unauthorised occupation of slums and private parties	15	
5	Recognisable as small pools of water	7	
6	Cannot be traced (fully encroached)	4	

The information available on 90 tanks out of 195 disappeared tanks as on 2006 indicates that they were converted into layouts, complexes, school, hospitals and bus stands. This fact also clear by a study conducted by IISc. The study indicates that the lakes and their area in the city have been on decline. The number of lakes declined from 321 ha in 1973 & with 87 ha in 2007 in the city area. Similarly, the lakes declined to 159 in 1973 & 93 lakes with 918 ha in 2007 in greater Bengaluru.

S.No	Lake	Present status :
1	Shoolay lake	Football stadium on Magrath Road
2	Akkithimmanhalli lake	Hockey statdium
3	Sampangi lake	Kanteerava Sports Complex
4	Dharmanbudhi lake	Kempegowda Bus Station
5	Challaghatta lake	Karnataka Golf Association
6	Koramangala lake	National Games Complex
7	Siddikatte Lake	KR Market
8	Karanji	Gandhi Bazar area
9	Nagashettihalli	Space department
10	Kadugondanahalli lake	Ambedkar Medical College
11	Millers (Chain of 3 tanks)	Guru Nanak Bhavan, Badminton Stadium, I.T complexes, schools and residential layout.
12	Puttenahalli tank	JP Nagar 6 th phase
13	Dasarahalli tank	Dr Ambedkar statdium
14	Longford tank	Hockey field
15	Koramangala Tank	It sits under 5,000 apartments built at a cost of Rs 270 crore – the National Games Village in Koramangala

KOMBAGHATTA LAKE



2005



2010



2014



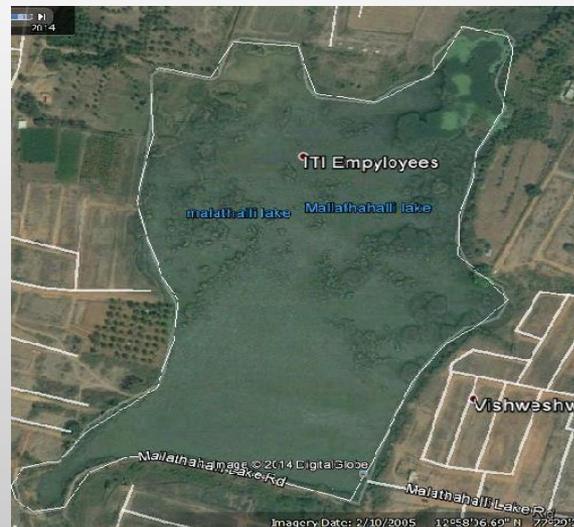
MALLATHALLI LAKE



2005



2010



2014



NISARGA ORCHARDS



2005



2010



2014



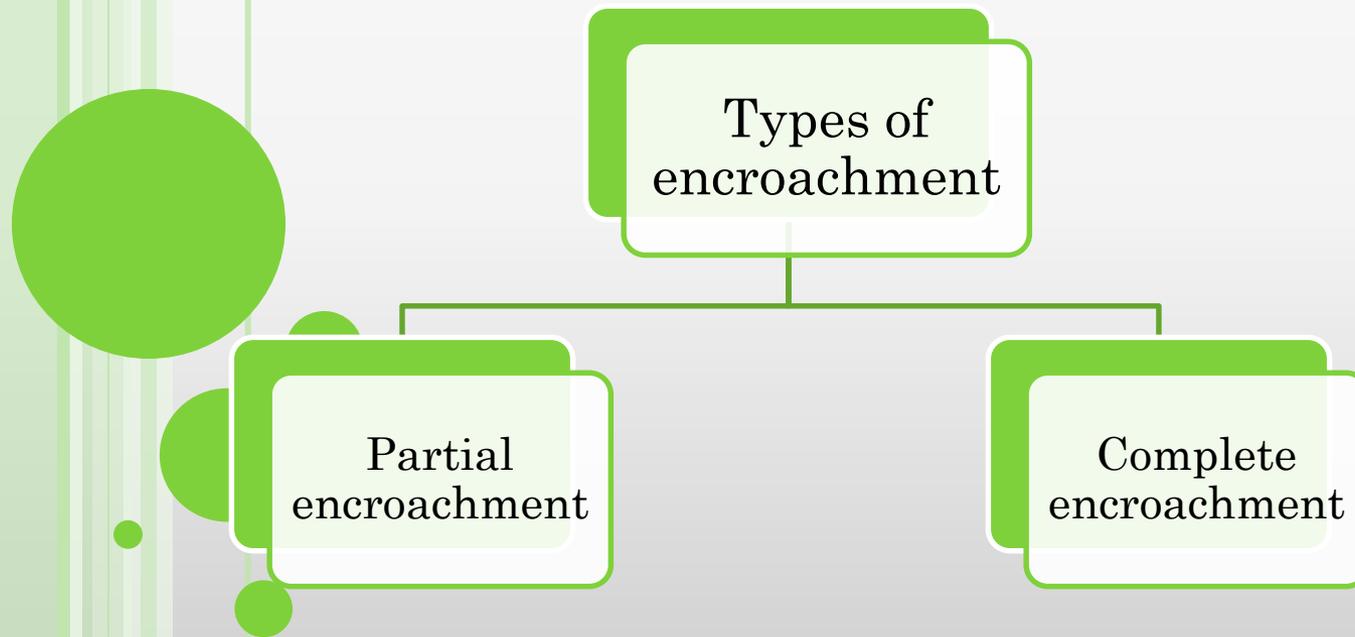
REASONS FOR THE ENCROACHMENT OF LAKES.

- The main reasons for the disappearance of lakes in Bengaluru are:-
 - Urbanization.
 - Lack of maintenance.
 - Corruption.
 - Lack of support from the Government.
 - Encroachment.



ENCROACHMENT

One of the major reasons for the disappearance of lakes, their storage capacities and shrinkage of their area is encroachment. However, the information in this issue is inadequate to understand its magnitude and impact. However, it is clear that both public as well as private sectors have encroached lakes.



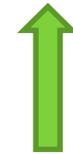
SURVEY....



SURVEY



Nisargha
orchards



Malathalli lake



Komaghatta
lake



MALLATHALLI LAKE.

- Mean height: 844m
- Easting's : $77^{\circ}29'50.57''$
- Northing's : $12^{\circ}57'43.47''$
- Mean Depth : 10 ft
- Length in (meters): 866.12m



TEST FOR WATER QUALITY.

TYPE OF TEST.	OBTAINED VLUE
pH	4.2
Electric conductivity	1045 μ S
Turbidity	471.33NTU
Hardness	294.2976 mg/l
Calcium hardness	168 mg/l
Chlorides	
COD	52 mg/l
TDS	616 ppm



KOMGHATTA

- Mean height: 800 m
- Easting's : $77^{\circ}28'04.13''E$
- Northing's : $12^{\circ}55'50.92''N$
- Depth : 15 ft
- Length in (meters): 654.43m



TEST FOR WATER QUALITY.

TYPE OF TEST.	OBTAINED VLUE
pH	7.8
Electric conductivity	572 μ S
Turbidity	16.45NTU
Hardness	63.326 mg/l
Calcium hardness	84 mg/l
COD	4
TDS	297 ppm



NISARGA ORCHARDS.

- Mean height:849 m
- Easting's :77°30'32.27"
- Northing's :12°57'54.37"
- Depth :8 ft
- Length in (meters) :153.91 m



TEST FOR WATER QUALITY.

TYPE OF TEST.	OBTAINED VLUE
pH	7.8
Electric conductivity	1222 μ S
Turbidity	16.45 NTU
Hardness	173.9472 mg/l
Calcium hardness	340 mg/l
COD	10
TDS	871 ppm



SURVEY REPORT



KOMBAGATTA LAKE

TYPE OF TEST	OBTAINED VALUE	BIS VALUE	EFFECT
pH	7.8	5.5-9.0	Beyond this range the water will affect the mucous membrane
EC	572 μ S	-	More the dissolved solids more conductivity
TDS	297 ppm	500-2000	
Turbidity	16.45 NTU		
Total hardness	158mg/l	300-600	
Calcium hardness	33.67mg/l		
Mg hardness	30.21mg/l		
Chlorides	93.72	250	Corrosion
COD	4	250	



MALLATHALLI LAKE

TYPE OF TEST	OBTAINED VALUE	BIS VALUE	EFFECT
pH	4.2	5.5-9.0	Beyond this range the water will affect the mucous membrane
EC	1045 μ S	-	More the dissolved solids more conductivity
TDS	616ppm	500-2000ppm	
Turbidity	471.33 NTU		
Total hardness	622 mg/l	300-600	
Calcium hardness	67.33 mg/l		
Magnesium Hardness	134.78mg/l		
Chlorides	164.72	250	Corrosion
COD	52	250	



NISARGA ORCHARDS

TYPE OF TEST	OBTAINED VALUE	BIS VALUE	EFFECT
pH	7.8	5.5-9.0	Beyond this range the water will affect the mucous membrane
EC	1222 μ S	-	More the dissolved solids more conductivity
TDS	871	500-2000	
Turbidity	14.93 NTU		
Total hardness	434	300-600	
Calcium hardness	136.27		
Magnesium Hardness	72.35		
Chlorides	129.22	250	Corrosion
COD	10	250	



REJUVENATION



REJUVENATION

Realizing the importance of lakes in terms of providing water, maintaining micro climate, enhancing ground water levels etc Several initiatives have been carried out in the recent years to preserve them and develop them in the proper manner with financial grants from the government and external agencies.

In order to overcome this problem of rejuvenation of lakes in and around the Bengaluru city, the state government set up an institution called the Lake Development Authority (LDA).

INVESTMENT ON LAKES

If we look at the restoration of the lakes under different schemes by different agencies, it is found that so far 46 lakes in the city have been rehabilitated through hesitating, bonding of sewage and fencing with an investments of Rs. 7868.91 lakh.

YEAR OF INVESTMENTS	AMOUNT SPENT
2001-2002	1,076 Lakhs
2003-2004	1,249 Lakhs
2004-2005	704.64 Lakhs
2005-2006	2335.464 Lakhs

REASONS FOR THE FAILURE OF REJUVENATION EFFORTS

- Out of nearly 200 lakes in Bangalore in the 6 cascades of Bangalore and its periphery have been rehabilitated with a lot of investment.
- Lack of integrated approach.
- Lack of vigil on lakes
- Garbage flow into lakes
- By-Passing of court laws
- Leasing of lakes by LDA to private builders
- Corruption



IMPACT OF VANISHED LAKES

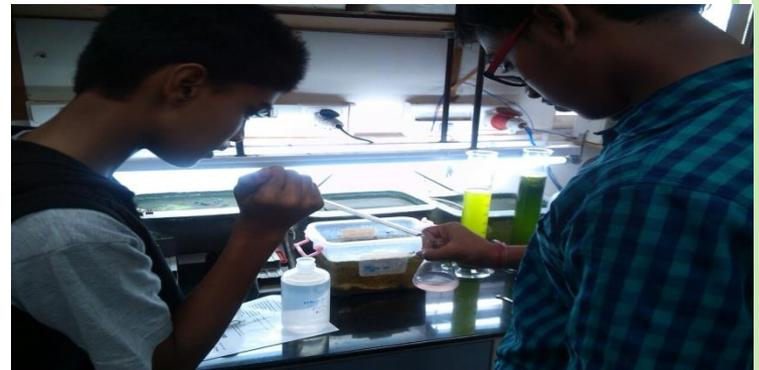
○ Introduction

The disappearance and neglect of the lakes in the urban areas has triggered a whole spectrum of issues such as reduction of lifespan, water pollution, ground water depletion, encroachments, health hazards, deprivation of livelihood of fisherman, agriculture and scarcity of drinking water.



EFFECT ON THE SOCIETY

- Loss of irrigated and catchment area
- Human suffering
- Loss of drinking water sources
- Reduction of storage due to encroachment
- Non- filling of lakes
- Pollution of water
- Presence of high concentration of metals in vegetables.



CONCLUSION

As we are familiar with the importance of the lakes and the tanks we must all join hands together and start protecting our lakes. “Earth and sky, woods and fields, lakes and rivers, the mountain and the sea are excellent school masters and teach some of us more than we can ever learn from books ”

“Prevent do not
repent”



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PROJECT BY..



ACKNOWLEDGEMENT

We would like to convey our warm regards to all our parents, teachers who have guided us and to IISc CES Department for providing this harmonious platform , in this beautiful place sirsi, to share our ideas and thoughts on Bangalore lakes.



THANK YOU

“

Rivers ,Ponds , Lakes and Streams .They all have different names, but they all contain water, just as religions do.....- they all contain truths...

”





TIME FOR QUESTIONS