



A STUDY ON CAUSES AND CONSEQUENCES OF URBAN LAKES POLLUTION IN COIMBATORE CITY

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Abstract

Urban lakes are an integral part of water resources for people living in urban areas and economic resources for fishermen and industrialists. But in recent decades urban lakes are encroached and converted into house plots, buildings, commercial purposes and also polluted due to industrial activities, chemical-intensive agriculture activities, and high population explosion are main causes for contamination of freshwater bodies. These activities affect the lake aquatic life, ecosystem services and reduce the water storage capacity of lakes. It was the main reason for the water shortage problem in urban cities. Hence, this paper seeks to find out the causes and consequences of lakes pollution in Coimbatore city through discussion with fishermen and households nearby lakes. This study is descriptive in nature and data gathered from Public Work Department, various reports and Newspaper. This paper reveals that fishermen are highly affected due to urban lake pollution because they are more economically depend on lakes for their livelihood. Moreover, the presence of lake gives us economic, environmental values and provides food security.

Key words: Pollution, Urban lakes, Aquatic life, Freshwater.

1. Introduction

In most of the Urban area, lakes are act as freshwater resources and provide the numerous ecosystem services. But this situation was changed in 21st century, due to rapid urbanization, industrialization, infrastructures development of cities, high population growth, water intensive life style, migration from rural to urban are increasing more pressure on freshwater resources and after utilization of water, tons of wastewater dispose into water bodies, which is very close to urban areas especially in Urban lakes. Freshwater bodies are the major recipients for domestic wastewater and industrial effluents (Bhat and Qayoom, 2021). However, the degradation and pollution of freshwater resources leads to water scarcity, spending more money for water treatment and people live in urban are indirectly spending more money for getting good quality of water.

Coimbatore city is the second largest city in Tamil Nadu. It was across the several stages of evolution from Agriculture to Industrial hub and at present in Information Technology hub. Coimbatore city is one of the Indian cities was selected under smart city mission. Under the smart mission Coimbatore city municipal corporation laid many projects and more importance given to water resources restoration project, the nine lakes are restored under smart city mission. But, due to improper maintenance, again lake condition get worsen. Because all lakes are surrounded by residency activities, commercial building, Bus stand, Markets, etc. So, some environmentalist and fishermen are stated that rather than beautification of lake, corporation must take actions to stop sewage water entering into lakes and often remove the water hyacinth, cleaning and maintenance of lakes are essential requirement than beautification of lake. Therefore, the study emphasis to find out the causes and consequences of lakes pollution in Coimbatore city.

2. Review of literature

Vani and Kamaraj (2016) mentioned that anthropogenic activities and unplanned urbanization are badly impact on water bodies in urban area. **Garg (2012)** stated that water pollution is the main causes for water borne diseases. It was not only affect present generation and also affected the future generation life. **Nishandh et.al., (2008)** point out the urban lakes are rapidly degraded due to liquid and solid waste disposal, filling, encroachment by building, housing and industrial activities.

3. Methodology

This paper is descriptive in nature. Urban lakes of Coimbatore city is the study area of this research paper. The information regarding causes and consequences of lakes in Coimbatore city was collected from the households surrounding lakes, fishermen and Kovai fishermen co-operative society. The secondary data was collected from Public Work Department, various reports and Newspaper. The Coimbatore city has 9 lakes namely Krishnampathy, Narasampathy, Selvampathy, Kumaraswamy, Selvachinthamani, Periyakulam/Ukkadam lake, Valankulam and Singanallur.

Profile of lakes under Coimbatore City Municipal Corporation limit

Narasampathy is the first lake receive the water from Noyyal river, through Chitrachavadi anicut channel. Its catchment area was 963 hectares, with 19.425 hectares of current lake bed area, lake water storage capacity 4.45 Million cubic feet (Mcft), Ayacut 551 acres, 4 Inlets and 5 Outlets. **Krishnampathy lake** main sources of water from Kolimedu, Karperyan channel and also receive the water from Noyyal river, through Chitrachavadi, Catchment area 2600 hectares, current lake bed area 21.853 hectares, water storage capacity 8.48 Mcft, Ayacut 569 acres, 4 Inlets and 3 Outlets **Selvampathy lake** was feed by Krishnampathy lake surplus water, lake Catchment area was 1600 hectares, current lake bed area 16.187 hectares, water storage capacity 4 Mcft, Ayacut 206 acres, 4 Inlets and 3 Outlets. **Kumaraswamy lake** is also called as **Muthannakulam**, it receive the surplus water from Selvampathy lake, its catchment area was 1600 hectares, current lake bed area 4.281 hectares, water storage capacity 6 Mcft, Ayacut 190 acres, 1 Inlets and 3 Outlets. **Selvachinthamani lake** catchment area was 1600 hectares, current lake bed area 10.522 hectares, water storage capacity 3 Mcft, Ayacut 72 acres, 1 Inlets and 1 Outlets. **Periyakulam/ Ukkadam lake** is the biggest lake in Coimbatore city, it fed by Coimbatore anicut on Noyyal river and receive the surplus water from

Selvachinthamani lake, catchment area was 6300 hectares, current lake bed area 136.379 hectares, water storage capacity 97 Mcft, Ayacut 1425 acres, 7 Inlets and 5 Outlets. **Valankulam** catchment area was 480 hectares, current lake bed area 38.85 hectares, water storage capacity 16.7 Mcft, Ayacut 870 acres, 7 Inlets and 5 Outlets. **Singanallur lake** is one of the biggest lake in Coimbatore city, its catchment area was 1178 hectares, current lake bed area 66.773 hectares, water storage capacity 30 Mcft, Ayacut 845 acres, 5 Inlets and 4 Outlets. All the lakes are connected with each other like chain flow.

4. Discussion

In this study, deliberated the reality causes and consequences of urban lake pollution. Therefore information was collected through focus group discussion with the fishermen who depends on the lakes for their livelihood and lakes nearby households statement and opinions.

4.1 Reasons/ Causes of Urban Lake pollution

❖ *Urban Household Sewage Water*

The prevailing sewer lines and drainage systems in the city are open type and partial close types. Sewage water of households nearby lakes and other effluents are mixing into the lakes without any proper treatment. Excessive sewage and industrial effluents are the main reasons for urban lake pollution. Some of the lakes are dysfunction due to sewage disposal, excessive growth of water hyacinth and during summer season lakes dry due to blockage in inlets and outlets.

❖ *Encroachment*

Fishermen stated that still some of the lakes outlets are encroached for commercial purposes. It destroy the lake connectivity because in Coimbatore city lakes are connected like chain, one lake outlet connected to inlet for other lake. So water flow to one lake another lake are blocked. And one more important encroachment is water hyacinth. Water hyacinth is aquatic plant encroached the full lakes. It was one of the major problems for fishers to catching fishing.

❖ *Industrial Wastewater*

Fishermen and people from nearby lakes stated that sometimes still industries are discharge the effluents into the lake during the night time. Car cleaning workshops, hospitals are locating nearby lakes, they are releasing the wastewater and it was mixed into lakes. This problem was mainly noticed in Singanallur Lake, Valankulam and Ukkadam lake.

❖ *Urbanization, High population, Urban life style, Improper dumping of Solid waste and Plastic waste*

Urbanization tends to high population growth in urban areas. High population rate leads to improper urban planning. Therefore, the people live in urban cities are using more plastic and generates tones and tones of solid wastes. The per capita solid wastes are increasing day by day. They does not follow the proper method for solid wastes dumping. Generally, people are dumping the wastes in low lying areas and water channels bunds. These are chain reasons for urban lake pollution.

❖ *Lack of Maintenance*

Some lakes are restored under the smart city mission and in few lakes still restoration process are going. After completion of smart city mission, the lakes are not maintain properly. Fishermen are reported that within 3 months invasion growth in water hyacinth and fully surrounded the lakes.

❖ *Visitor activities*

People are visits lake regularly but lake visitor activities affect the aquatic species. They threw the bottles, plastic bags and throw the stones into lakes. The fishermen specified that government should provide the dustbin around the lakes and restricted the plastic bags usages around the lakes. It helps to reduces the plastic waste and protect the lakes.

❖ *Activities of households nearby lakes*

Fishermen stated that the lakes nearby households does not follow the proper method for solid waste dumping, they are frequently threw the domestic wastes and due to improper sewer lines and drainage system, wastewater and raw sewage are directly or indirectly come to lakes. All these activities are leads to change the lake water quality and affect the aquatic life.

4.2 Consequences of Urban Lake pollution

▪ *Economic impact to Fishermen and Farmers*

Fishermen are the first victim of urban lake pollution. Fishermen are highly affected due to lake pollution and it was created the negative externality. One person actions affect the other person without his permission and compensation. It means sewage from households around the lakes, hotels, industries and commercial purposes wastewater is mixed into lake water, it affected the fishes and freshwater ecosystem services. Its largely hit the fishermen daily income, because they are economically depend on the lake for their livelihood. The Lakes are provide economic security for their family. But in recent decades, lot of fishes are die in lake, they face huge loss and employment opportunity also decline. Farmers are the second victim due to lake pollution, they are depend on lake water for agricultural activities, because of lake water pollution and illegal sewage water mixing into the lake. the farmers are changing the cropping pattern and agricultural activities.

▪ *Excessive growth of Water Hyacinth*

Excessive growth of water hyacinth problems creates more problems to fishermen. It was affecting the fish catching, fish breeding, lot of fish stuck under water hyacinth and die. Fishermen are reported that seasonally fishes are die in the lakes. The manual removal of water hyacinth not good solution for the problems and all the lakes have heavy eutrophication. Corporation and NGO's are take necessary actions to remove the water hyacinth mechanically and manually but after removal of 3 to 6 months water hyacinth was grow excessively.

▪ *Change in Freshwater aquatic life, Fish varieties and other lake aquatic species are extinction*

Fishermen are reported that, every year lot of fishes are die in lakes due to sewage water disposed into lakes and climatic change highly affect the freshwater aquatic life. Some native variety of fishes are exterminated and fish breeding also affect. So, fishermen bearing the huge economic loss.

- **Change in lake water quality**

Fishermen are stated that due to mixing of household sewage water, improper disposal solid wastes and frequent usage of plastic wastes are affected the ecosystem services of lakes in Coimbatore city. It was change lake water quality. All the lakes water was green in colour. The fishermen, farmers and households are specified that once upon time these lake water was used for main sources of drinking water.

- **Change in Groundwater quality and quantity**

Water bodies are helps to recharge the groundwater level but, nearby households of lakes stated that due to lake pollution and urbanization, the groundwater level goes down and contaminated the ground water, change in water colour, taste and also many borewells are dried out. It leads to increasing the purchase of can water for drinking purpose in households.

- **Water scarcity**

The pollution of freshwater bodies creates reverse effects, in form of water shortage problem. The particularly in summer season people are facing heavy water scarcity and buying the can water for drinking purpose. This indicates that pollution of freshwater bodies creates the water is an economic good.

5. Conclusion

This study found out that households sewage, industrial effluents and people activities are malicious for lake water quality and its ecosystem services. People do not know the value of urban lake and its ecosystem services. Pollution of freshwater resources reverse effects to people in form of water scarcity and spending more treatment cost for water borne diseases. So, Government steps to make awareness about the economic value of lake ecosystem services, implementation and function of wastewater treatment plant for processing the wastewater before discharge into lakes. This paper suggest to corporation must take necessary actions for make awareness to people about the economic value of lake, usefulness and implement the proper measures to control the wastewater discharge into lakes and protect the freshwater ecosystem in a sustainable manner.

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