

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH, NEW DELHI

Original Application No. 534 of 2025

In the matter of:

Ram Lal Singh**Applicant****Vs.****State of Uttar Pradesh & Ors.****Respondents****Index**

S. No	Particulars	Page No.
1.	Response on behalf of CPCB respondent no. 13 in compliance to Hon'ble NGT order dated 14.11.2025 in O.A. No. 534/2025.	
2.	Annexure I- A copy of Hon'ble NGT order dated 10.05.2019 in O.A No. 325/2015 titled as Lt. Col. Sarvadaman Singh Oberoi Vs Union of India & Ors.	
3.	Annexure II- A copy of Indicative Guidelines for Restoration of Water Bodies" (in compliance to Hon'ble NGT Order dated 10.05.2019 in M.A. No. 26/2019 in O.A. No. 325 of 2015.	
4.	Annexure III- A copy of letter dated 08.12.2025 & 07.01.2026 issue by CPCB to UPPCB.	



**Filed by Advocate Suman Arora
On behalf of Central Pollution Control Board**

Place: Delhi

Dated: 05.02.2026

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
PRINCIPAL BENCH, NEW DELHI
Original Application No. 534 of 2025**

In the matter of:

Ram Lal Singh

Applicant

Vs.

State of Uttar Pradesh & Ors.

Respondents

**RESPONSE ON BEHALF OF CENTRAL POLLUTION CONTROL
BOARD (CPCB), RESPONDENT NO. 13**

1. That the Hon'ble National Green Tribunal (hereinafter referred to as the "Hon'ble NGT"), Principal Bench, New Delhi vide Order dated 14.11.2025 in Original Application (hereinafter referred to as "OA") No. 534/2025 has sought the response / reply of CPCB in the instant matter. Thereby the reply is made in the succeeding paragraphs.
2. That CPCB is constituted under the Water (Prevention and Control of Pollution) Act, 1974 (hereinafter referred to as "the Water Act, 1974"). It performs the functions under the Water Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981 (hereinafter referred to as "the Air Act, 1981"), and the Environment (Protection) Act, 1986.
3. That the State Pollution Control Boards/Pollution Control Committees (hereinafter referred to as "SPCBs/PCCs") have been constituted in States / Union Territories under the Water Act, 1974 and the Air Act, 1981 and are



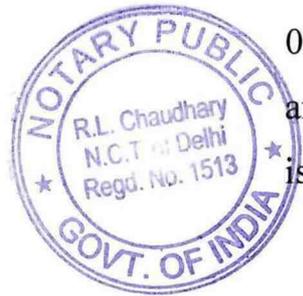
empowered to perform the functions and implement the provisions of these Acts in respect of territories falling in their respective Territorial Jurisdiction.

4. That the matter is related to allegations of illegal encroachment, construction, and occupation of a pond area bearing Gata No. 196, in village Fulhera, Deoria, Uttar Pradesh which as per applicant is duly classified in the government and Revenue Records as Pokhari (Water Body).
5. That the applicant further submitted that such pond in village Fulehra is not merely water reservoirs but repositories of biodiversity, traditional knowledge, and cultural heritage. Further, it is alleged by the applicant that the Respondents No. 15 and 16 have encroached upon the said water body and have raised illegal construction and has also levelled allegations of inaction by concerned authorities which have emboldened encroachers and land mafias across the state, who are targeting ponds, Johars, and other common waterbodies with impunity.
6. That at the outset, the Answering Respondent denies all claims, contentions, allegations and averments against Answering Respondent CPCB in the above OA contrary to anything stated or submitted in this reply. Nothing in the OA may be deemed to have been accepted or admitted by the Answering Respondent for want of a specific denial or on the ground of non-traverse, save any averment which has been expressly admitted hereinafter.
7. That it is submitted that CPCB has formulated Indicative Guidelines for Restoration of Water Bodies in compliance with the directions of Hon'ble NGT's Order dated 10.05.2019 in O.A. No. 325 of 2015 titled *Lt. Col.*



Sarvadaman Singh Oberoi Vs. UoI & Ors. The copy of the said Order dated 10.05.2019 of Hon'ble NGT is appended herewith as **ANNEXURE – I** and the Indicative Guidelines for Restoration of Water Bodies formulated by CPCB are appended as **ANNEXURE – II**.

8. That further CPCB requested all SPCBs/ PCCs to formulate their Action Plans for restoration of water bodies in their respective States/UTs vide letter dated 18.06.2019.
9. That in relation to the instant case, CPCB has taken up the matter with Uttar Pradesh Pollution Control Board (UPPCB), vide letter dated 08.12.2025 and 07.01.2026 seeking the Status Report in the matter. Copies of the said letters are enclosed as **ANNEXURE – III (Colly.)**. The Response from the UPPCB is awaited.
10. That further, it is submitted that the subject matter of enforcement to stop illegal encroachment, construction, and occupation of a pond comes under the purview of local bodies and state authorities. Thereby, it is humbly submitted that no specific information regarding the subject matter is available with this answering respondent due to non-receipt of status report from UPPCB. Accordingly, it is prayed that the Hon'ble Tribunal may also consider the response filed by the concerned agencies for adjudication of the instant matter.
11. That, the answering respondent herein craves leave of the Hon'ble NGT to file additional reply, if required, in future.



12. That, in the light of the above submissions, it is respectfully submitted that this Answering Respondent, i.e., CPCB, shall abide by any order(s) or direction(s) passed by this Hon'ble NGT in the instant OA.



A handwritten signature in blue ink, appearing to read "Nazimuddin".

(Nazimuddin)
Scientist 'F'
Central Pollution Control Board
05.02.2026

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
PRINCIPAL BENCH, NEW DELHI
Original Application No. 534 of 2025**

In the matter of:

Ram Lal Singh

Applicant

Vs.

State of Uttar Pradesh & Ors.

Respondents

AFFIDAVIT

I, **Nazimuddin**, working as Scientist 'F' in Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi, Respondent No. 13 in the above matter, do hereby solemnly affirm, declare on oath and state as under:

1. That I, the deponent herein, is well conversant with the facts and circumstances of the present case on the basis of the information derived from the official records, and hence, I am competent to verify, sign and swear this affidavit on behalf of the Respondent CPCB.
2. That the accompanying response may be read part and parcel of the present affidavit.
3. That the accompanying response has been drafted and filed under my instructions and authority, the contents thereof are true and correct based on the record maintained during the ordinary course of business of CPCB and available records and documents and the contents of the same are read over and explained to me and are not repeated herein for the sake of brevity.



hary

DEPONENT

नाज़िमउद्दीन / Nazimuddin
वैज्ञानिक 'एफ' / Scientist 'F'
केंद्रीय प्रदूषण नियंत्रण बोर्ड
Central Pollution Control Board
(पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार)
(Ministry of Environment, Forest and Climate Change, Govt. of India)
परिवेश भवन, पूर्वी अर्जुन नगर, दिल्ली-110032
Parivesh Bhawan, East Arjun Nagar, Delhi-110032

VERIFICATION

05 FEB 2026

Verified at Delhi on this day of February 2026, that the contents above are correct and true based on the records of the case as mentioned in the day-to-day affairs of the CPCB. Nothing has been concealed therefrom or misstated.



A handwritten signature in blue ink, appearing to be "Nazimuddin".

DEPONENT

नाज़िमउद्दीन / Nazimuddin
वैज्ञानिक 'एफ' / Scientist 'F'
केंद्रीय प्रदूषण नियंत्रण बोर्ड
Central Pollution Control Board
(पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार)
(M/o Environment, Forests And Climate Change, Govt. of India)
परिवेश भवन, पूरबी अर्जुन नगर, दिल्ली-110032
Parivesh Bhawan, East Arjun Nagar, Delhi-110032

ATTESTED

A handwritten signature in blue ink, appearing to be "R.L. Chaudhary".
NOTARY PUBLIC
GOVT. OF INDIA

05 FEB 2026

Item No.09

Court No. 1

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI**

M.A. No. 26/2019

IN

Original Application No. 325/2015

Lt. Col. Sarvadaman Singh Oberoi

Applicant(s)

Versus

Union of India &Ors.

Respondent(s)

Date of hearing: 10.05.2019

**CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE S.P. WANGDI, JUDICIAL MEMBER
HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER**

For Applicant(s): Ms. Nivedita Sharma, Advocate with Mr. Lt. Col. Sarvadaman Singh Oberoi, Applicant

For Respondent(s): Mr. Anil Grover, AAG, State of Haryana and Mr. Rahul Khurana, Advocate

ORDER

1. The issue for consideration in the original application is identification, protection and restoration of water bodies in the State of Haryana. However, in the light of proceedings which have taken place, we are of the view that the scope of the application needs to be extended to the entire country in the interest of protection of environment.
2. This application was filed on 14.08.2015 before this Tribunal in the context of Gurgaon District and as per status report as on

09.03.2017 filed before this Tribunal on behalf of State of Haryana referred to in the order dated 20.07.2018, there are 1216 water bodies in the State of Haryana which are larger than 2.25 Ha and 123 water bodies which are in possession of the State in Gurgaon District while the total number of the water bodies are 641 (later corrected as 647) in Gurgaon District. The Tribunal directed that for 123 water bodies which are in possession of the State, steps be taken for their proper maintenance and restoration. An exercise be undertaken in the entire State of Haryana to identify water bodies. On such identification, water bodies be assigned Unique Identification (UID) number and steps be taken for restoration. Report was sought within six months.

3. Status report has been filed vide email dated 25.04.2019 by the Haryana Pond and Waste Water Management Authority (HPWWMA) stating that HPWWMA has been established under a State Act called the HPWWMA Act, 2018 notified on 23.10.2018 for development and protection of ponds and matters connected therewith. Pond has been defined as a tank or lake or any other inland water body having an area of 0.5 acre or more. The authority is to undertake survey and take steps for restoration of water bodies, PDMS (Pond Data management System) has been developed which can be accessed through "<http://hpwwma.org>": DPMOs (District Pond Management Officers) are appointed for each District. As per PDMS data, 16306 ponds fall under the Panchayats and 265 ponds fall under the Urban Local Bodies. The same have been given UID

numbers and work of development will be undertaken by DPD (Development and Panchayat Department). The work for connecting the ponds with the nearby canal network will be executed by the IWRD (Irrigation and water Resources Department). 200 most problematic and overflowing ponds will be addressed during 2019-20. 193 model ponds which are overlapping with the said 200 ponds will be developed in first phase for which a plan has been prepared.

4. The Gurgaon Metropolitan Development Authority (GMDA) has also given a report to the effect that water bodies in the District are owned by 20 different entities. Work of restoration of 123 water bodies was taken up which has been widened to improve 647 water bodies. In all 826 water bodies, as found as per record, the task involves identification and verification of data, review and categorization of water bodies, assigning UID numbers, preparation of maps and analysis of information in regard to size, restoration potential, etc. 20% of the water bodies are at risk due to discharge of untreated sewage, industrial effluents or waste water.
5. Learned counsel for the applicant submits that not even a single water body has so far been taken up for restoration inspite of the exercise undertaken for identification of the water bodies. The steps for preventing dumping of solid waste or discharging of effluents are urgently required. The State of Haryana may take necessary steps in terms of the status report referred to in para 3 & 4 above as well as in the light of general directions which we propose to issue to all the States/UTs.

6. There can be no dispute that the water bodies play significant role in recharge of ground water, preventing soil erosion, harnessing rain water and maintaining micro-climate in the area. Need for conservation and protection of water bodies is thus obvious. This requires involvement not only at the level of the State but also at the level of the community for which State needs to take initiative. The threat caused to the water bodies is by dumping of waste, discharge of effluents and encroachments. The steps required for restoration will include preparation and implementation of catchment area treatment plans, setting up of green belt and wherever viable setting up of bio-diversity parks around the water bodies, cleaning up of the garbage/debris and demarcation by the Revenue Department on identification survey and demarcation. Each water body is required to be given a geo-referenced-UID and an action plan is required for restoration and protection of each of the water bodies. In this view of the matter, need for conservation and protection of water bodies is not confined to the State of Haryana alone but extends to the whole country.

7. The Hon'ble Supreme Court in *Hinch Lal Tiwari v. Kamala Devi & Ors.* (2001) 6 SCC 496 observed:

“It is important to notice that the material resources of the community like forests, tanks, ponds, hillock, mountain etc. are nature's bounty. They maintain delicate ecological balance. They need to be protected for a proper and healthy environment which enables

people to enjoy a quality life which is the essence of the guaranteed right under Article 21 of the Constitution. The Government, including the Revenue Authorities i.e. Respondents 11 to 13, having noticed that a pond is falling in disuse, should have bestowed their attention to develop the same which would, on one hand, have prevented ecological disaster and on the other provided better environment for the benefit of the public at large. Such vigil is the best protection against knavish attempts to seek allotment in non-abadi sites.”

8. The above observations advance the Public Trust Doctrine which is based on the principle that certain resources like air, water and forests have such great importance to the people as a whole that the same cannot be subject of private ownership. The same are gift of the nature and should be made freely available to the people. The Doctrine requires the State to protect such resources and not to permit them to be used for private or commercial purposes.¹ This concept is applicable to wetlands and all water bodies which is essential for protection of the environment. If the ponds and other such water bodies are not protected and conserved, this will in turn affect recharge of ground water, rain water harnessing and soil preservation.

9. Ground water conservation remains a challenge. This led the Hon'ble Supreme Court to direct constitution of the Central Ground Water Authority (CGWA) vide order reported in *M.C Mehta v. Union of*

¹(1997) 1 SCC 388, M.C. Mehta vs Kamal Nath & Ors

India & Ors, (1997) 11 SCC 312. The data compiled by the said authority shows that there are over exploited, critical and semi critical areas (OCS). The ground water is on the decline in the said areas. In this regard, it may be noted that vide order dated 11.07.2018 in *W.P.C No. 4677/1985, M.C. Mehta v. Union of India and Ors.*, the Hon'ble Supreme Court noted the report of the Niti Ayog on "Composite Water Management Index", June 2018, in which it is stated, *inter alia*:

"In fact by 2020, 21 major cities, including Delhi, Bangalore and Hyderabad will be expected to reach zero groundwater levels, affecting access for 100 million people".

10. The Tribunal has, vide order dated 07.05.2019 in *O.A No. 176/2015, Shailesh Singh Vs. Hotel Holiday Regency, Moradabad & Ors.*, directed the CGWA to prepare a policy for conservation of groundwater with a robust institutional mechanism for surveillance and monitoring with a view to enhance access to ground water for drinking purposes in OCS areas by way of appropriate replenishment practices which can be properly accounted and measured as well as to sustain the flood plains of rivers in terms of e-flows, augmentation of subterranean flows and preservation of other water bodies. The Tribunal also considered the matter in the context of Delhi, vide order dated 30.08.2018 in *Original Application No. 496 of 2016, Tribunal on its own Motion Vs. Govt. of NCT of Delhi & Ors.*, and appointed a Committee headed by the former Judge of Delhi High Court to oversee the steps for conservation of ground

water in Delhi. We also note the guidelines for National Lake Conservation Plan prepared by MoEF&CC in May 2008 as well as National Plan for Conservation of Aquatic Ecosystem (NPCA) prepared by MoEF&CC in November, 2016. Irrespective of the subject being covered by a particular State statute, the protection of water bodies is an essential need for protection of environment as held in *Hinch Lal Tiwari (Supra)*. Such requirement is covered by the 'Precautionary' principle as well as the 'Sustainable Development' principle which are required to be enforced by this Tribunal under Section 20 of the NGT Act, 2010. The HPWWMA Act, 2018 covers only ponds having area of more than 0.5 acres. Thus ponds of lesser area have been left out of regulation under the said Act. This aspect needs to be addressed to the extent the same remains un-addressed not only in Haryana but throughout India to the extent the existing statutory framework or guidelines do not cover comprehensively the subject of restoration of all the water bodies. The definition of water body in the Haryana Act is as follows:

“the ‘pond’ means a tank or lake or any other inland water body having an area of 0.5 acre or more, whether it contains water or not, and mentioned in revenue records as talab, johar, tank or by any other name and includes green belt and the peripheral catchments areas, main feeder inlet and other inlets, bunds, weirs, sluices etc but does not include wet lands as notified by the Government from time to time.”

11. The above definition shows that only ponds of area of more than 0.5 acres are sought to be restored under the statutory provisions of the said Act. While in terms of the orders of the Hon'ble Supreme Court in *Hinch Lal Tiwari (Supra)* even ponds of lesser area will be covered for being protected and restored. This is also imperative in terms of the concern raised in the order of Hon'ble Supreme Court dated 11.07.2018 in *W.P.C Nos. 4677/1985, M.C. Mehta vs. Union of India &Ors.* for conservation of ground water. If all water bodies including ponds of lesser area than 0.5 acre are not covered, this will affect the environment including recharge of ground water, harnessing of rain water, prevention of soil erosion and maintaining the micro climate. We may, however, clarify that focus may be on ponds, etc. recorded in the revenue record.
12. We may note that there are 351 polluted river stretches in India identified as such by the CPCB which need remediation. The matter is being considered by this Tribunal in *Original Application No.673/2018*, News item published in "The Hindu" authored by Shri Jacob Koshy titled "More river stretches are now critically polluted : CPCB. In O.A. No. 148/2016, Mahesh Chandra Saxena Vs. South Delhi Municipal Corporation &Ors., vide order dated 10.05.2019, it was observed that reuse of treated sewage water as well as restoration of water bodies are connected to ground water conservation, which in turn is connected to remedying the pollution of polluted river stretches.

13. Thus to give effect to 'Precautionary' principle and 'Sustainable Development' principle, we direct all the States and UTs to review the existing framework of restoration all the water bodies by preparing an appropriate action plan. Such action plans may be prepared within three months and a report furnished to the CPCB. The CPCB may examine all such plans and furnish its comments to this Tribunal within two months thereafter. The Chief Secretaries of all the States/UTs in the course of undertaking monitoring exercise in pursuance of the order of this Tribunal in *O.A No. 606/2018, Compliance of MSW Rules, 2016*, may also include restoration of water bodies as one of the items as the same is also incidental to waste management which are covered by orders in *O.A No. 606/2018, Compliance of MSW Rules, 2016*.
14. The CPCB may prepare and place on its website guidelines in the matter of restoration of water bodies in the light of above order within one month.
15. The matter may also be monitored by Central Monitoring Committee constituted in terms of order dated 08.04.2019 in *O.A No. 673/2018, News item published in "The Hindu" authored by Shri Jacob Koshy titled "More river stretches are now critically polluted : CPCB*, as this matter is connected to the steps required for remedying the polluted river stretches as already explained.
16. A copy of this order be sent to the Chief Secretaries of all the States and Union Territories and the CPCB by email.

List for further consideration on 09.12.2019.

Adarsh Kumar Goel, CP

S.P. Wangdi, JM

K. Ramakrishnan, JM

Dr. Nagin Nanda, EM

May 10, 2019
M.A. No. 26/2019
INOriginal Application No. 325/2015
AK



“Indicative Guidelines for Restoration of Water Bodies”

(in compliance to Hon’ble NGT Order dated 10.05.2019 in M.A.No. 26/2019 in OA.No. 325 of 2015)



Central Pollution Control Board

(Ministry of Environment, Forest and Climate Change, Govt. of India)

Parivesh Bhawan, East Arjun Nagar

DELHI-10 032

(www.cpcb.nic.in)

June 2019

CONTENTS

S.No	Description	Page No.
1	Introduction	1
2	Recognition Phase	5
3	Restoration Phase	8
4	Protection Phase	16
5	Improvement Phase	23
6	Sustenance Phase	38
7	References	39
8	List of Figures	
	Figure 1. A Model Lake or Pond Restoration Technique	28
	Figure 2. Model Flow Chart for Restoration of Pond or Lake	29
	Figure 3. Model Flow Chart for Rejuvenation of Polluted Rivers	37
	Figure 4. Flow Chart Showing Criteria for Categorization of River Monitoring Location	48
	List of Annexures	
	Annexure-I: Water Quality Criteria-Designated Best Use	41
	Annexures-II: Criteria for categorization of river monitoring location	42

Indicative Guidelines for Restoration of Water Bodies (Polluted Lakes, Ponds and Rivers)

1 Introduction

Adequate availability of water of required quality is pre-requisite for survival and quality of human life. Surface water bodies like lakes, ponds, reservoirs, tanks and rivers were treated as community resource or asset over the centuries. In urban areas also such water bodies played an important role as a source of drinking water, absorption of flood water and a conduit for ground water recharge. They were being nurtured, protected, conserved and managed by the active participation of the local community without any code of conduct or rule. In turn, these water bodies have been catering the local human and livestock populations. The introduction of public water supply and ground water development through tube wells and hand pumps in the modern times, coupled with urbanization and industrialization induced pollution, a tectonic shift in the attitude of the people towards these water bodies has been witnessed. Both locals as well as the government have started neglecting this asset and have stopped caring, nurturing and conserving these community resources. Mushrooming urban, industrial and infrastructure development has further changed the status of these water bodies from community resources to a mere dumping ground or sink for solid wastes, construction debris, domestic sewage, industrial effluents, religious offering etc. resulting in severe degradation in the quality of such resources.

India has had abundant supply of water resources. However, from being a water abundant country India is gradually progressing towards water scarcity due to increasing population pressure, urbanization and uncontrolled growth. At present it is sustaining 18 per cent of world population with 4 per cent of global water

resources. Therefore, management of water resources has assumed great importance. Today availability of water resources is a major issue and is a big challenge facing our country.

In order to revive, restore and rehabilitate the traditional water bodies, the Government of India launched a Scheme for Repair, Renovation and Restoration (RRR) of water bodies which has multiple objectives like comprehensive improvement and restoration of water bodies thereby increasing tank storage capacity, ground water recharge, increased availability of drinking water, improvement in agriculture/horticulture productivity, improvement of catchment areas of tank commands, environmental benefits through improved water use efficiency by promotion of conjunctive use of surface and ground water, community participation and self-supporting system for sustainable management for each water body, capacity Building of communities in better water management and development of tourism, cultural activities, etc. by providing Central Grant to State Governments under a Pilot Scheme directly linked to agriculture during the remaining period of Xth Five Year Plan in January 2005. Keeping in view the benefits arising out of the implementation of the scheme, it was extended to XII Plan as well. Further, the Ministry of Environment, Forest and Climate Change is implementing a Centrally Sponsored Scheme of National Plan for Conservation of Aquatic Eco-systems (NPCA) since February, 2013 for conservation and management of identified lakes and wetlands in the 11 country in a holistic and integrated manner. Under the scheme financial assistance is provided to the concerned State Governments for undertaking various activities for conservation of wetlands and lakes, which also include a small component of lake front development and beautification, especially in urban lakes.

The National Water Policy (2012) formulated by MoWR, RD&GR advocates conservation, promotion and protection of water and highlights the need for augmenting the availability of water through rain water harvesting, direct use of

rainfall and other management measures. Further, the Standing Committee on Water Resources (2012-13) in their 16th Report on “Repair, Renovation and Restoration (RRR) of Water Bodies” also substantiated that *encroachment on water bodies is threatening the existence of a large number of water bodies and throwing consequent challenges of depleting ground water resources, occurrence of devastating floods in urban areas as well as water scarcity. Afore-said Committee suggested steps required to remove encroachment and to restore the water bodies.*

In recent years several metro cities such as Mumbai and Chennai have witnessed unprecedented flood. Encroachment of river bed is one of the reasons of flooding since it reduces the desired waterway of the river. Inadequacies of flood protection works, reduction in the water holding capacity of natural reservoirs in the basin due to progressive siltation, breaching of river banks, raising of river bed caused by deposition of silt are also the reasons. Encroachments happen due to number of local factors, thus issue is to be looked into by concerned State Government as per the prevailing rules and regulations of the respective State/UT.

As per MoWR, RD & GR, total number of water bodies have declined in the States which may be attributed to (i) increase in population and density of population per square kilometer; (ii) change in land use pattern; (iii) shift from paddy based agriculture to cash crop cultivation; (iv) depletion of ground water; (v) rapid Urbanization; (vi) unplanned urbanization and development activities; (vii) boom in construction activity; (viii) new water bodies have been developed to meet the additional requirement of water for drinking water and irrigation arising due to increase in population; (ix) some of the water bodies mainly, wells in southern group of islands were lost due to submergence of coastal area during tsunami in 2004.

NITI Aayog based on a study warning that India is facing its 'worst' water crisis in history and that demand for potable water will outstrip supply by 2030 if remedial steps are not taken. Nearly 600 million people faced high to extreme water stress. Also, made predictions that twenty-one cities, including Delhi, Bengaluru, Chennai and Hyderabad will run out of groundwater by 2020, affecting 100 million people. If matters are to continue, there will be a 6% loss in the country's Gross Domestic Product (GDP) by 2050. Moreover, critical groundwater resources, which accounted for 40% of India's water supply, are being depleted at "unsustainable" rates and up to 70% of India's water supply is "contaminated" 'Therefore, *water resource available to the country should be brought within the category of utilizable resources to the maximum possible extent.*

Therefore, existing scenario necessitates formulation of guidelines for restoration of water bodies keeping in view (i) to make pollution free water bodies and to meet the desired water quality criteria; (ii) to preserve excess water during monsoon, (iii) to restore and augment storage capacities of water bodies (iv) to serve and enhance ground water recharge; (v) increased availability of water for different intended purposes etc., These guidelines are only indicative guidelines and limited to restoration of ponds, lakes, polluted rivers or streams and divided into two parts i.e., stagnated surface water bodies such as ponds, lakes and rolling surface water bodies such as rivers or streams. However, concerned stakeholders are advised to conduct detailed gap analysis to enable to include related action plans for restoration of water bodies for ensuring compliance to Hon'ble NGT order dated 10.05.2019. For understanding aspects relating to restoration of water bodies, the documents already published or issued by Ministry of Water Resources, River Development and Ganga Rejuvenation (MoWR, RD & GR), Ministry of Housing and Urban Development also be referred as given at Sl. No. 7 References of these indicative guidelines.

This requires an understanding on the status of the water bodies, their suitable use, need for management and conservation so that they serve as a good

resource for future, potential strategies for long-term management especially in the urban areas, which are facing severe water shortage. It should include (i) Recognition Phase, (ii) Restoration Phase; (iii) Protection Phase; (iv) Improvement Phase and (v) Sustenance phase

2. Recognition Phase

Identification and recognition of the problem (inventory of existing and lost water bodies (due to encroachment, pollution, diversion etc.), analysis of cause of the problem and its effect and development of alternative solutions of problem as detailed below: -

2.1 Collection and maintenance of historical information relating to the water bodies

Based on the records available or remote sensing data or GIS maps, interaction with the public living in the vicinity of the water body, following information relating to the water bodies should be collected and records maintained by the concerned department in the State/UT: -

2.1.1 Stagnated water bodies such as ponds/lakes

A. Geographical details of the water body: - GPS Location and address of the water body, size or dimensions, area, elevation above mean sea level, ownership of the water body, boundaries with earmarking, map of water body (Digital map or remote sensing or satellite map over the years/National Wetland Atlas) with salient features

B. Hydrological description of the water body: - area, category of lake or pond (natural or man-made), average and maximum depth of stored water (during monsoon and non-monsoon period), total storage capacity, main source of water (rainfall/groundwater seepage/catchment

runoff/direct or indirect flow from any river or stream or creek), water permanence (permanent or intermittent), destination of excess water from pond or lake, purpose used to serve (like drinking water source, fisheries and agriculture or cultivation of aquatic food plants, recreational and aquatic sports, ground water recharge, act as a sink for sediments, habitat for noteworthy animal species, migratory birds or any other purpose), status of lakes or ponds in terms of % open water and aquatic vegetation.

C. *Catchment Description*

- Details on natural drains or flood channels and their flows contributing to water accumulation.
- Major Towns, total population living around the water body, any sewage contribution from the towns, total sewage generation, total no. of existing STPs and their treatment capacities, if any.
- Major industrial clusters or estates contributing to pollution in water body, total no. of industries (sector-wise), sector-wise total industrial effluent generation, existing industrial effluent treatment capacity [(both captive and Common Effluent Treatment Plants (CETPs)], if any.
- Total waste generation (waste like municipal solid waste, plastic waste, industrial hazardous waste, construction and demolition waste), existing provision for collection, transportation, treatment and disposal practices in the vicinity;
- Any other relevant information such as: - (i) Declared Wetland Ramsar sites, (ii) Bio-diversity details such as flora and fauna biodiversity (list of plant species, list of animal species, species of conservation significance (rare, endangered, threatened, endemic species), major plant invasive alien species and extent of invasion, major animal invasive alien species and extent of invasion.

2.1.2 River or streams

A. *Digital map* of river under consideration with its tributaries showing salient features.

B. *Geographical and Hydrological description of polluted river*

Origin of the river and confluence with any other water body, length of travel of the river before confluence with any other water body, velocity of flow (in m/sec), average cross-sectional area (in m²), average depth of flow (in m) during monsoon and non-mon-soon period, volume of flow or discharge (in m³/sec), tributaries of the river under consideration for restoration, GPS location details of all the tributaries and drains confluence with the river or stream; drains or channels contributing to river pollution;

C. *Catchment description*

- Purpose used to serve by the river or streams
- Major towns along the banks of the river, town-wise total population (with projection for the next 20 years), total water consumption (both supply by local or urban bodies and the ground water consumption), total sewage generation pattern, no. of STPs and the treatment capacity.
- Major industrial estates or clusters along the banks of the river, Industry-sector –wise no. of industries, total water consumption, total industrial effluent generation and existing mechanism for treatment of industrial effluent.
- GPS location details of STPs, CETPs and their capacities, if any
- Ground water status, its utilization and the quality.

- Agricultural practices and the control measures with respect to agricultural runoff.
- Flora and fauna including biodiversity etc.

Also, water being state subject, the State Government or Union Territory Administration should assign the task of maintaining historical records pertaining to each water body to concerned Department in the State/UT and also to designate one responsible Department to enable to take necessary remedial actions as and when situation demands.

2.2 Digital Mapping of all the collected information

All the collected information to be located on the map and such details to be periodically updated and maintained by the concerned department in the State/UT.

- 3. Restoration Phase** includes declaring the 'designated best use' in order to formulate strategies and to decide degree of treatment required for restoration of such water body, if required, selection of best solution to problems identified and application of the solution to the problems of the land which vary from case-to-case, to achieve the designated best use water goals as detailed below: -.

3.1 Designation of water body for its use by the State/UT

The landscape of India is dotted with large number of lakes, reservoirs and wetlands. Historically, the water bodies such as ponds or lakes have met water demands of the population for centuries and a community management system had sustained them for a long period of time.

In a water body or its part, water is subjected to several types of uses. Depending on the types of uses and activities, water quality criteria have been specified to determine its suitability for a particular purpose. Among the various

types of users there is one use that demands highest level of water quality or purity and that is termed as “Designated Best Use” in that stretch of water body. Based on this, water quality requirements have been specified for different uses in terms of primary water quality criteria. The Primary Water Quality Criteria for bathing water already prescribed under Environment (Protection) Rules, 1986.

Every pond, lake, river or stream falling under the jurisdiction of the concerned Department of the State Government or UT Administration is required to declare for its ‘designated best use’ in order to formulate strategies and to decide degree of treatment required for restoration of such water body, if required. In the absence of such information, it would be difficult for the regulatory authorities to formulate the strategies to be prepared in case restoration of such water bodies is required.

Water being the State subject, such list of water bodies with designated best use with all the relevant information collected by the concerned Department of the State/UT Administration is required to be submitted to the concerned State Pollution Control Board (SPCB)/Pollution Control Committee (PCC), Central Pollution Control Board (CPCB) as well as MoEF & CC, MoWR, RD & GR.

3.2 National Restoration Goals (Ponds, Lakes and Rivers)

‘Water quality criteria-designated best use’ water quality parameters as given at **Annexure-I** is required to be followed as ‘National Restoration Goals (for Ponds, Lakes or Rivers)’. However, this national restoration goals or criteria given at Annexure-I is only indicative and national restoration goals issued from time to time need to be followed for restoration of water bodies.

Monitored water quality of the water body (lakes and ponds) for relevant parameters (monitored at least 8 times in a year) (average mean value) is compared with the ‘National Restoration Goals’. In case of ponds or lakes, if the monitored water quality of the selected water body is complying at least i.e.,

6 out of 8 times to the designated best use water quality parameters, then such pond or lake is fit for the 'designated best use' and if not then requires remedial measures for its restoration. *This criterion is applicable only in case of ponds and lakes.*

*In case of rivers or streams, the criteria issued from time to time by CPCB for categorization of monitoring location need to be followed and accordingly, the strategies to be formulated for its restoration to achieve at least bathing water quality criteria. Criteria for categorization of river monitoring location is ~~are~~ given in **Annexure-II**. **This criterion is to screen the potential locations having pollution (w.r.t bathing water quality parameters i.e., BOD and Faecal Coliform only) and requires more comprehensive examination to identify all the possible sources of pollution.***

3.3 Steps to be followed for restoration of stagnated polluted ponds or lakes

Conservation and restoration requires a systematic and comprehensive plan to study selective and representative freshwater ecosystems. Details of the study should include the status of ponds or lakes or rivers, their suitable use, management and conservation so that they serve as a good resource for future use and formulation of strategies for long-term management especially in the urban areas.

3.3.1 World Lake Vision

The World Lake Vision has been developed by International Lake Environment Committee (ILEC), Japan (<https://www.ilec.or.jp/en/pubs/>), in collaboration with UNEP , aiming at illuminating the growing crisis in management of lake ecosystem, articulating principles to guide the transition towards managing lakes for their sustainable use and to provide a practical blueprint for ensuring long-term health of lakes and integrity of their survival and economic development. The Seven Principles of Sustainable Lake Management are:

- A harmonious relationship between humans and nature is essential for the sustainable use of lakes.
- A lake drainage basin is the logical starting point for planning and management actions for sustainable lake use.
- A long-term, preventive approach directed to preventing the causes of lake degradation is essential.
- Policy development and decision making for lake management should be based on sound science and best available information.
- The management of lakes for their sustainable use requires the resolution of conflicts among competing users of lake resources taking into account the needs of present and future generations and of nature.
- Citizens and other stakeholders should be encouraged to participate meaningfully in identifying and resolving critical lake problems.
- Good governance, based on fairness, transparency and empowerment of all stakeholders, is essential for sustainable lake use.

The restoration of any water body should be considered only based on the needs and its utilities. *General steps to be followed for restoration of water bodies includes following: -*

3.3.2 Assessment of water quality of the selected water body

Water quality of all the designated best use water bodies are required to be monitored for relevant parameters and as per frequency prescribed under 'guidelines for water quality monitoring 2017' by Ministry of Environment, Forest and Climate Change (MoEF & CC). *Wherever, frequency is not suggested, water bodies are required to be monitored following the standard protocols for collection of samples by the concerned department at least once in a month or but not less than 08 months in a year (covering pre and post-monsoon period)*

3.3.3 Need for restoration of water body

The monitored values of the water body is analyzed based on the criteria suggested under these guidelines or criteria issued from time to time by CPCB for identification of polluted lakes or ponds or rivers or streams and decision be taken for restoration of water body. The criteria suggested for river monitoring location is to use for initial screening and identification of potential hotspots on the river. A comprehensive examination of water quality is required for identifying sources.

3.3.4 Identification of sources of pollution, quantification and assessing detailed gap analysis

Following steps to be followed for identification of sources of pollution, its quantification and for carrying out detailed gap analysis

A. Desk Review and Reconnaissance Survey

Identification of various sources contributing to pollution in ponds or lakes—need to be carried out based on desk survey (available information or data/ google map/ historical records) and physical reconnaissance survey (based on physical visual observations, interactions with the local public etc.,) for identification and ascertaining the sources of pollution of ponds or lakes. All the possible sources of pollution should be identified which may be

- open channels or drainage channels contributing untreated sewage or untreated or partially treated effluent discharge from existing sewage treatment plant in the vicinity (or)
- any untreated industrial effluent discharges either from the individual industry or any common effluent treatment plant (CETP) located in the vicinity (or)

- improper disposal of solid waste (plastic waste/ municipal solid waste/industrial hazardous waste/sludges from septic tanks or sewage treatment plants (STPs) or hazardous waste disposal from common effluent treatment plants (CETPs) (or)
- Run off from nearby agricultural fields, if any.
- Social and cultural misuse of ponds or lakes by local communities especially for immersion of idols during festival seasons.
- Any open-defecation around the ponds or lakes by the people living in the vicinity due to lack of sanitary facilities in their dwellings or colonies and fencing all around such water body.
- Physical condition of weed growth and necessity for dredging- Aquatic plants growing in ponds and lakes are beneficial for fish and wildlife as they provide food, dissolved oxygen, and spawning and nesting habitat for fish and waterfowl. Aquatic plants can trap excessive nutrients and detoxify chemicals. However, dense growths (over 25% of the surface area) of algae and other water plants can cause (i) Fish kills; (ii) Fish flavor problems; (iii) Pond water odor problems; (iv) Drinking water taste problem and (v) Stunted fish growth.
- Silting or sediments in the ponds or lakes due to improper disposal of waste including construction and demolition waste or silt contribution from drainage channels which reduces storage capacity and accumulation of contaminated sludges.
- Status of aesthetic conditions around the water body
- Condition of the banks or bunds, spill over (provision to ensure smooth flow of excess floods on downstream especially during monsoon period) or flood channels including obstructions if any.

- Encroachment of waterbodies due to urbanization
- Condition of Eutrophication of lakes or ponds due to inadequate measures (due to indiscriminate discharge of Industrial effluents, runoff from agricultural fields, refuse and discharge of sewage, domestic wastes like food remnants, soaps, detergents cause depleted levels of dissolved oxygen in water lead to a situation where other aquatic life-forms cannot survive).
- Available In-situ available technological options for restoration of ponds or lakes (such as aeration, bio-remediation) in lakes or plants)

B. Detailed gap analysis

Detailed gap analysis to be made w.r.t municipal sewage, industrial effluent and waste management with a projection of at least 15 to 20 years, existing infrastructure for management of municipal sewage, industrial effluents and waste management in the catchment area of the water body under consideration for its restoration including volumetric flow details of all the channels or drains contributing to pollution in water body, as detailed below: -

- **Sewage management:** - Total population (with projected population at least for the next 20 years) living around the water body, total water consumption (taking into account both water supply by local/urban bodies as well as ground water consumption), total sewage generation (with projected generation quantities), total no. of existing STPs and their treatment capacities and the observed gap with regard to the sewage management (gap may be estimated in the catchment of waterbody).

- **Industrial effluent management:** - Industrial clusters or estates contributing to pollution in water bodies, total no. of industries, estimation of total water consumption by the industries, total industrial effluent generation, existing treatment capacity (both captive and common effluent treatment plants (CETPs), gap in industrial effluent management and the requirement for captive or common effluent treatment plants
- **Waste Management:** - waste-wise total waste generation, existing provisions for collection, transportation, treatment and disposal (in compliance to the concerned rules) with their capacities and waste-wise gap analysis and the requirements for their management

C. Identification of other associated issues which requires attention as a part of restoration of pond or lake

Apart from identification of all possible pollution sources, detailed gap analysis, additional measures required on case-to-case basis to be identified especially in case of ponds or lakes w.r.t the following aspects: -

- Buffer Zone development maintenance and the existing activities within the buffer zone.
- Feasibility for Bio-diversity park in case adequate land is available in the vicinity of ponds or lakes.
- Greenery development in the vicinity of the ponds or lakes.
- Introduction of recreation facilities such as paddle boats, building jetty.
- Machinery and the man power requirement for maintenance of

the restored water body.

- Existing provision for disposal of waste arising from the desiltation and de-weeding activity of a pond or lake.
- Awareness and training requirements.
- Any other related measures required also be analyzed for inclusion of such actions while making action plans for restoration of water body (E.g., aesthetic point of view, bins for rubbish management which may be generated due to visitors).

4. **Protection Phase** that takes care of the general health of the water body and ensures normal functioning. A long-term, preventive approach directed to preventing the causes of waterbody degradation is essential.

4.1 Preparation of action plans

Action plans to be prepared based on the historical information collected, desk review, reconnaissance survey conducted, detailed gap analysis for ensuring additional measures required for restoration of water body (vary from case-to-case) covering both direct and indirect measures with specific time targets and the organization responsible for implementation of action plans with budget estimates. Action plans should include covering following aspects: -

- A. Sewage Management:** - for management of sewage inflow if any (which is causing eutrophication of lake or pond) by having adequate infrastructure for treatment of sewage through adequate capacity of sewage treatment plants (STPs) or combination of other low cost treatment technologies for ensuring discharge norms notified under Environment (Protection) Act, 1986 and same should be ensured by an individual generator of sewage as well as by the concerned local or urban body.

B. Industrial effluent management: - for management of industrial effluent inflow by having adequate infrastructure for treatment of industrial effluent in the form of captive industrial effluent treatment plants or through common effluent treatment plants by the respective industry contributing to the pollution of water bodies and same also should be ensured by the respective State Industrial Development Corporations or State Pollution Control Board (SPCB) or Pollution Control Committee (PCC). Adoption of state-of-the technologies for production processes and for ensuring treatment of generated industrial effluent (feasibility adoption of zero liquid discharge).

C. Management of waste

- Adequate infrastructure should be ensured for management of wastes (such as municipal solid waste, industrial hazardous waste, construction and demolition waste, plastic waste, e-waste) in accordance with the respective provisions notified under the Environment (Protection) Act, 1986, by all the concerned.
- Periodic physical removal of improperly disposed wastes (such as municipal solid waste, construction and demolition waste, plastic waste, industrial hazardous waste, human and animal night soils) by the concerned local or urban body.

D. De-siltation

- Periodic removal of nutrient enriched accumulated sludges in ponds and lakes helps in ground water recharge potential, removal of contaminated sediments as well as increases storage capacity of lakes or ponds.

- Sediments removed from the ponds or lakes should be stored in a designated area (till moisture is completely drained out) at a suitable distance away from ponds or lakes and such dried sediments should be removed immediately so that sediments will not become a part of ponds or lakes once again especially in the event of any rain fall. Depending on the characteristics, such sediments after draining may be used as manure (complying to the manure quality prescribed under Solid Waste Management Rules, 2016 as amended from time to time or disposed of in accordance with the relevant provisions notified under Environment (Protection) Act, 1986.

E. De-weeding

- **Periodic dredging** (once in three months) of 80 % of dense and thickly covered aquatic plants viz., floating plants such as algae, duckweed, watermeal, water hyacinth; submerged plants such as milfoil, hydrilla, water lettuce, curly-leaf pondweed, clasping-leaf pondweed, coontail, sago pondweed, water lily, water shield etc., bottom sediment, and associated nutrients should be carried out. De-weeding methods include: -
 - **Preventive measures**
 - such as proper design and construction of ponds or lakes including levelling and smoothing of banks
 - **Manual or physical control measures**
 - Manual or physical control measures such as non-chemical and non-motorized measures be taken for removal of weeds (manual harvesting) using hand pulling, rakes, cutters, benthic barriers, drawdown, aeration, shading and weed rollers as these measures are typically very low, however, such measures

are labor intensive and are therefore better suited to small, less established weed populations. Hand pulling and raking may result in turbid or murky water and may create plant fragments that can subsequently spread to new sites.

➤ **Mechanical control measures**

- Using motor-driven under water weed cutters or floating weeds, rotovators essentially large-scale underwater rototillers for tilling up lake or pond sediments as well as to chop and loosen plant roots, or draglines (in case of underwater pond or lake dredging) (or) dry-land excavation machinery such as bulldozers (in case of drained ponds or lakes) shall be used (or)
- Limiting the amount of sunlight available to aquatic plants by floating black plastic sheeting on the water surface (or) use of dark-colored and nontoxic water dyes (such as nigrosine, aniline and aqua-shade)

- **Biological controls** i.e., introducing aquatic animals and plants that eat or compete with waterweeds. Herbivorous animals (those that eat plants) include a wide variety of insects, snails, crayfish, tadpoles, turtles, fish (sterile, triploid grass carp), ducks, geese, and swans which can be stocked in ponds or lakes to consume aquatic plant.

➤ **Application of common aquatic herbicides for control of lake or pond weeds**

Use of herbicides is not recommended as it may kill fish in ponds or lakes. Herbicides should be used in a controlled and systematic way under the supervision of the expert and general herbicides that may be used for weed control are as given below-

- *For Algae (microscopic, filamentous, Chara) control- Herbicides such as copper sulfate, copper chelates, endothall,, simazine)*
- *Submerged Plants (coontail, watermilfoil, pondweeds such as sago, curlyleaf, leafy) control- Herbicides such as Endothall, Diquat, simazine, fluridone may be used*
- *Free-floating plants (duckweed, watermeal) control:- Herbicides such as Diquat, simazine may be used*
- *Rooted-floating plants such as (waterlilies, spanerdock) control- Herbicides such as Glyphosate and 2,4,-D may be used*
- *Emergent plants (cattails, perennial grasses, and broadleaves) control: - Herbicides such as Glyphosate may be used*

F. Prohibition of discharges or disposal of waste or washing activity and action against violators

- Ban on discharge of industrial effluent or sewage or waste (such as municipal solid waste or industrial hazardous waste or plastic waste or construction and demolition waste or sludges from septic tanks/ STPs/CETPs) into lakes or ponds or drainage channels connected with ponds or lakes or open defecation in the vicinity as well as washing of clothes or wading of cattle
- Stringent actions be taken against violating industry by the SPCB/PCC as per provisions under Water (Prevention and Control of Pollution) Act, 1974 as well as Environment (Protection) Act, 1986

- Levying of fine or Environmental Compensation on the violators for improper disposal of sewage or industrial effluent or wastes into lakes or ponds.

G. Stabilization of earthen bunds and the drainage channels as well as silt and soil erosion control measures

- Stabilization of earthen embankments, shore line protection with vegetative or rock riprap to avoid soil erosion and the inflow drainage channels with the stone revetment or pitching so as to avoid rapid seepage or leakages
- All the inflow drainage channels should be provided with suitable silt barriers or sediment traps or sediment detention basins at suitable intervals for control of silt especially during monsoon.
- Also, at all the outfalls of drainage channels, suitable strains or traps should be provided to control inflow of all the floating materials and periodic removal of floating materials should be ensured.

H. Protection drainage basin including preservation of drainage channels

A lake or pond drainage basin is the logical starting point for planning and management actions for sustainable lake or pond use. A long-term, preventive approach for preventing the causes of degradation is essential.

- Historically the drainage channels which used to carry natural runoff from the drainage basin and presently carrying either untreated municipal sewage or industrial effluent or both and contributing to pollution of water bodies eventually due to encroachment in view of urbanization. All such drainage channels need to be restored by interventions such as (i) stoppage of inflow of untreated municipal

sewage or industrial effluent. If required, interaction and diversion of untreated sewage or industrial effluent from such drainage channels by routing through properly designed dedicated sewerage network to ensure conveyance and for ensuring treatment and disposal through STPs/CETPs. Feasibility of in-situ treatment of treated sewage and industrial effluent within drainage channels and prior to the inflow into the water bodies also be explored by the concerned authorities.

- Major channels running from the larger watersheds should be identified based on the historical data and such drainage channels should be preserved and protected with suitable buffer land without any impervious cover. This aspect should be ensured by the State Local/ Urban Development/Town Planning authorities while planning or expansion of a locality.

I. Removal of encroachments and blockades

- The State Government or UT Administration should maintain records pertaining to the boundaries of each pond or lake in the respective State/UT and necessary steps should be taken and ensured removal of all encroachments in the water body spread area/water body boundary as and when required.
- Removal of encroachments in the drainage channels should be carried out periodically to facilitate enhancement in aeration naturally in the water body
- Refrain from granting any consent for establishment for large scale projects in the catchment areas.

- Pond or lake boundary should be provided with fence (permanent / temporary fencing) to avoid unauthorized entry.

J. Flood Control Measures

- Excess floods from drainage basin be controlled with a provision of properly designed 'spill way' with a provision of controlled gates for smooth flow of excess water or run off during monsoon.
- Remove all encroachments (lake bed, storm water drains) to prevent calamities related to floods and to facilitate inter connectivity of water bodies.
- Removal all blockades at inlet or outlets should be ensured to avoid stagnation or blockage of storm water.

5. Improvement phase that deals with overall improvement in the water body and its uses including resolution of conflicts among competing users of lake resources taking into account the needs of present and future generations and of nature.

5.1 Adoption of In-situ techniques for in-situ remediation of ponds or lakes

A. *Physical treatment approaches*

Aeration (using surface aerators or , submerged aerators or a combination of both may be used to increase the dissolved oxygen in the water body, which is used by microorganisms to degrade the pollutants. Aeration also aids in mixing the different thermal layers of the water body, resulting in de-stratification, exposing the lower-most layers to atmospheric air. The need and extent of aeration is calculated based on the water quality parameters, depth of water body, ambient temperatures, wind conditions

etc.). Apart from aeration, methods such as wastewater diversion, periodic de-weeding and sediment dredging, proper maintenance of drainage channels or feeder channels also helps in increase in dissolved oxygen)

B. Chemical treatment approaches

Flocculation using chemicals like alum and neutralizing chemicals especially during acidification (increase in pH level of the stagnated water body)

C. In-situ techniques

- *Using aquatic plants* (Macrophytes such as water hyacinth (*Eichhornia crassipes*) and water lettuce (*Pistia stratiotes*), Whorl-leaf watermilfoil (*Myriophyllum verticillatum*), pondweed (*Potamogeton* spp.), common reed (*Phragmites communis*), cattail (*Typha latifolia*), duckweed (*Lemna gibba*) and canna (*Canna indica*)
- *Using aquatic animals* such as clams, snails and other filter-feeding shellfish
- *Using biological techniques* may be used to decompose, transform and absorb water pollutants. However, concentration and frequency of dosing of the microbial cultures is decided based on the volume of the water body, water quality parameters, ambient temperatures and extent of algal growth [as per literature (i) an enzyme namely Phycoplus and the nutrients are mixed thoroughly and sprayed into the pond within 2-3 weeks' time significance difference may be seen; (ii) treatment method based on hydroponics technique that cleans the lake by absorbing nutrients dissolved in the water and thereby supporting living species inside the lake; (iii) floating

treatment wetlands (FTW) which are artificial islands made of chemically inert materials, gravel having floating characteristics with plants that stay afloat on the lake or ponds such as wetland plants, water hyacinth, mosquito repellents and ornamental plants like cattails, bulrush, citronella, canna, hibiscus, fountain grass, flowering herbs, tulsi and ashwagandha) which helps in cleaning the lake or pond through hydroponics system, (iv) Introduction of mixture of nutrients to grow algae formed by diatoms (the most basic, single-cell life form found in water bodies) which helps in release of oxygen into water and in turn aerobic bacteria present in water body helps to break down the organic matter and convert the pollutants to base constituents and also reduces odors from the lakes or ponds. The diatoms are eaten by zooplanktons that are, in turn, consumed by fish].

5.2 Drainage basin management

- Drainage basin management includes control of non-point sources, structural and land treatment measures (regular monitoring of structures and systems and carrying out necessary rehabilitation and modernization programmes), interception and diversion of nutrients, sediments control (terracing, contour farming, grassed water ways, prior to reaching stagnated water body.
- Crop management, crop residue management and creation of shelter belts, good Irrigation practices, run off control provisions from agriculture runoff laden with excess fertilizers and pesticides

5.3 Green or Buffer Zone

- Buffer Zone around a lake or pond (at least 50 to 100 m periphery) should be maintained as green belt zone or no activity zone and no activity is allowed within the buffer zone by the concerned Departments in the State/UT. In case, any activity presently existing within the buffer zone (50 to 100 m), such as residential or commercial or industrial activity should take necessary measures to prevent discharge of any wastes into the water body.
- Within the buffer zone, no impervious cover is allowed and mainly plantation with a dense population of deeply rooted plants, trees, shrubs and grasses should be created so as to absorb nutrients (which promotes aquatic plant growth and a shift in the water quality) that comes directly from the anthropogenic activities.

5.4 Creation of biodiversity environment

In case the water body happens to be a site for the visit by migratory birds the number and type of trees by the side of the water body and water channels have also to be monitored to ensure adequate shelter as well as suitable environment for egg laying and propagation of bird species.

5.5 Monitoring of Implementation of action plans for restoration of ponds or lakes

The action plans are to be prepared and submitted to CPCB for seeking approval. The action-plan should include activity-wise action points, specific time lines, organization responsible for implementation, budget estimates as well as Program Evaluation and Review Technique (**PERT**) chart for implementation of action plans within the specified timelines, Upon approval of action plans for restoration

of ponds or lakes, thereafter, execution of action plans to begin and to be mentioned on monthly basis by the Monitoring Committee to be constituted under the Chairmanship of Principal Secretary (Environment) of the respective State Government or Union Territory Administration. The monitoring committee should review the progress on implementation of the action plans at least once in three months and apprise the Chief Secretary of the State/UT periodically.

A model lake restoration technique is given at **Figure 1** and a model flow chart for restoration of Ponds or Lakes is given in **Figure 2**.

LAKE OR POND RESTORATION TECHNIQUES

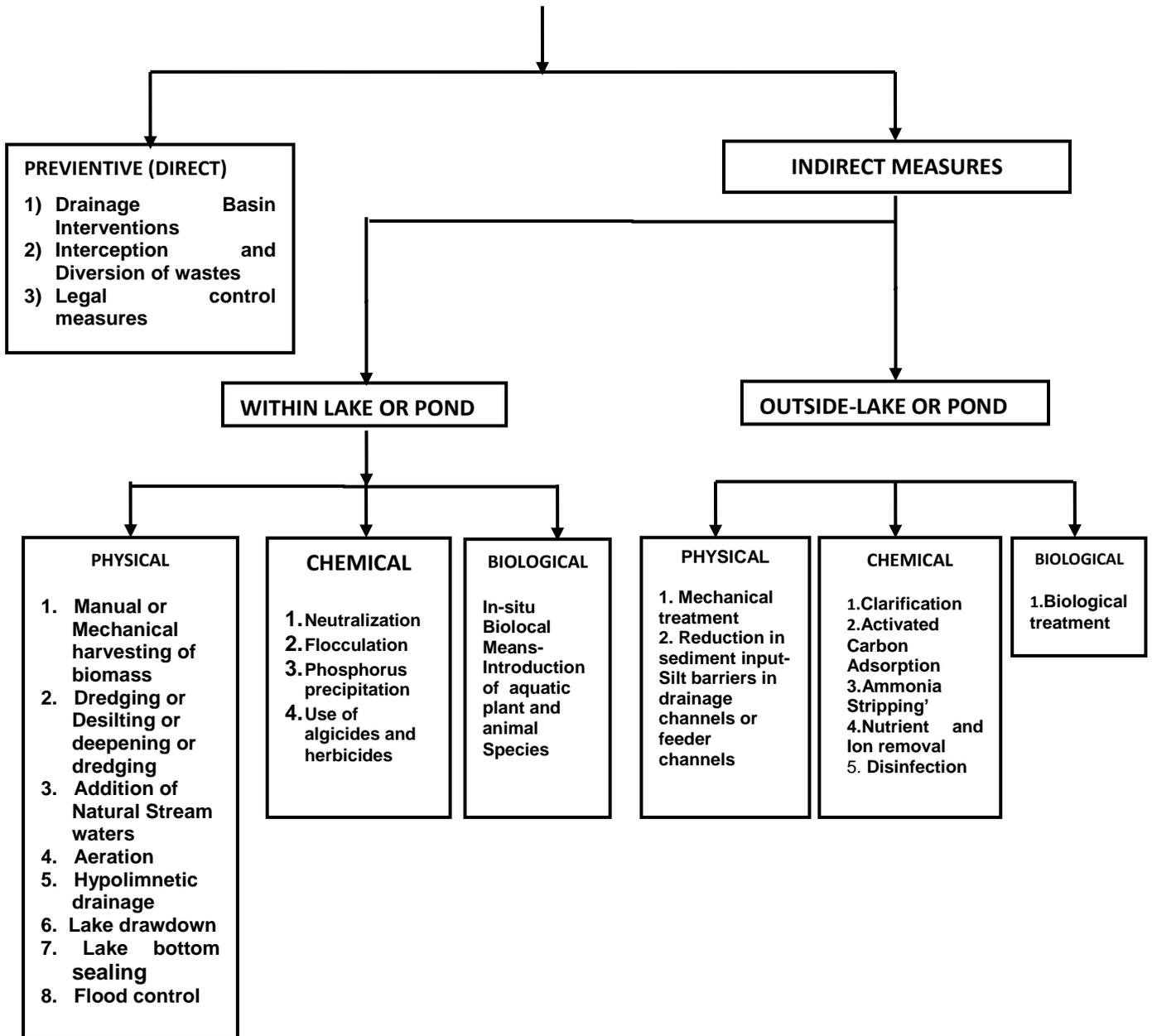


Figure 1. A Model Lake or Pond Restoration Technique

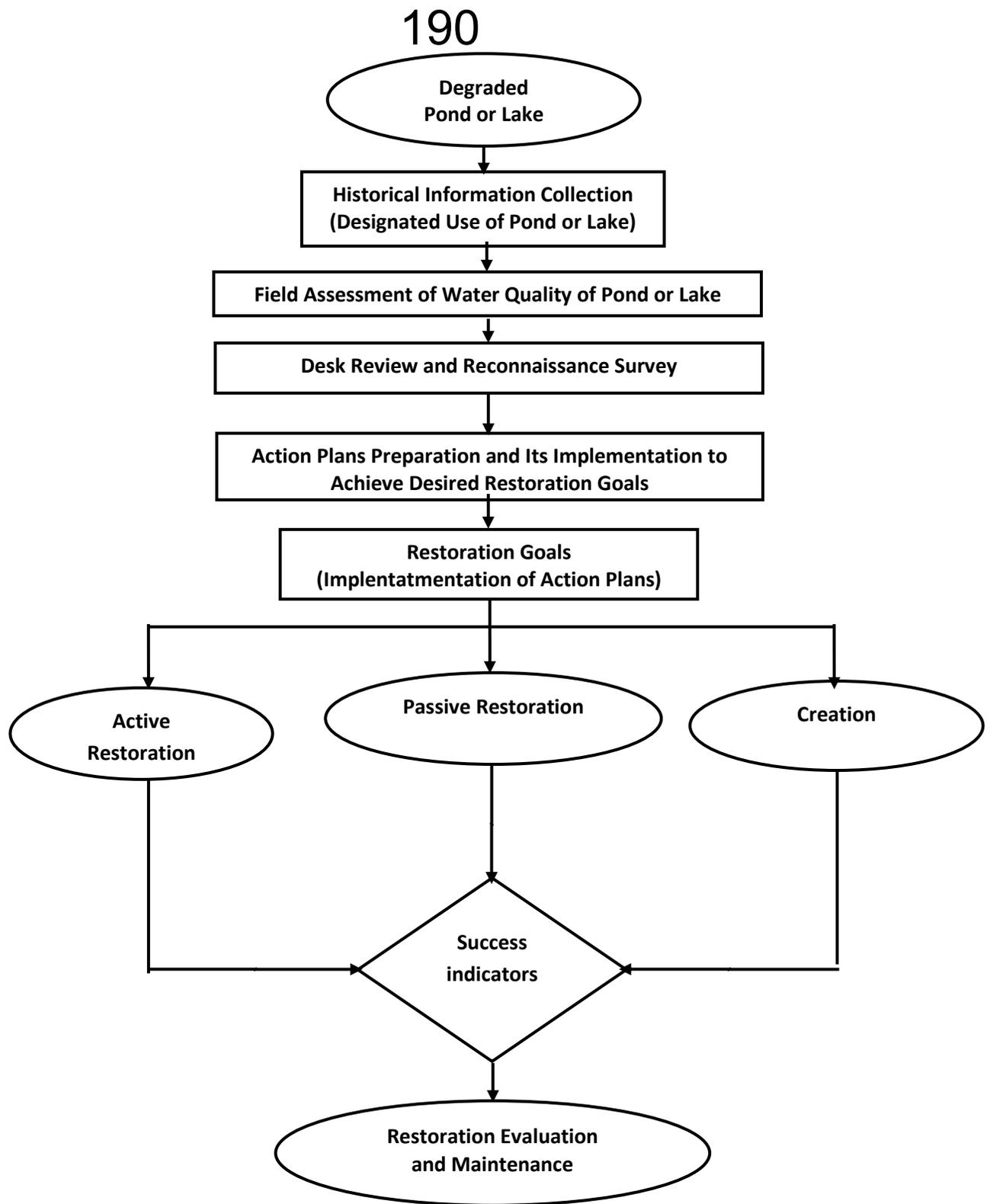


Figure 2. Model Flow Chart for Restoration of Pond or Lake

5.6 Steps involved in preparation of Action Plan for rejuvenation of polluted river stretches

A. Background Information (Refer to Sl. No. 2.1.2)

- (i) Digital map of identified polluted river with its tributaries
- (ii) Geographical and hydrological description of polluted river
- (iii) Catchment description- uses of river, towns, cities and villages, industries (sector-wise no. of industries), ground water status and its utilisation, agricultural practices, flora and fauna etc.

B. Water Quality of River and Its Tributaries

- (i) Water quality of river and its tributaries (at least for five years)
- (ii) Quality assigned as per modified Water Quality Criteria (**Annexure-I**)

C. Identification of Causes of Pollution in Catchment Area of the River

➤ Industrial Pollution

- (i) List of water polluting industries, industry sector-wise: water consumption, effluent generation and quantity of industrial effluent discharged into river
- (ii) Status on granting of Consent under Water (Prevention and Control of Pollution) Act, 1974
- (iii) Status on granting of authorization under the Hazardous & Other Waste (Management & Transboundary Movement) Rules, 2016 as amended (as applicable)
- (iv) Compliance status and action taken (Placing in public domain)
- (v) Final disposal mode of treated industrial effluents (i.e., disposal on land or drain or ZLD or drain connected to CETP etc.,)
- (vi) Performance status of captive Effluent Treatment Plants (if applicable)
- (vii) Existing Common Effluent Treatment Plants (CETPs) and their performance status.
- (viii) Regulation of small scale industries/tiny units'/service units discharging effluents/sludge disposal into drains/landfill or any other mode of disposal

➤ Ground water management

- (i) Status of ground water level-reserves in the catchment area of river under consideration
- (ii) Blocks identified as over exploited, critical, semi-critical and safe (as per Central Ground Water Board (CGWB) if any)

- (iii) Status of permissions granted by Central Ground Water Board (CGWB) to the industries and other Development projects in the catchment area of river.
- (i) Compliance of conditions stipulated by CGWB and subsequently by SPCB.
- (ii) Ground water sources (Hand –pumps, Wells, Tube Wells) identified in the catchment area of the river and the characteristics (at least for the period of two years);
- (iii) Ground water sources (Hand –pumps, Wells, Tube Wells) identified as non-potable for human consumption in river stretch with Geo-genic/or polluted due to industries.
- (iv) Compliance on ground water charging imposed by Rain Water Harvesting Mechanism.
- (v) Existing mechanism for supply of potable water to the human population in the affected areas.
- (vi) Health deformities /clinical reports in polluted river stretch areas in view of ground water contamination.

➤ **Sewage treatment and disposal: -**

- (i) Cities, towns and villages located on the bank of river stretches discharging sewage effluents through drains into the river.
- (ii) Quantification and pollution load of sewage generated by a city/town/village.
- (iv) Status of septage management.
- (v) Listing of drains carrying sewage and trade effluents joining river and determining flow and characteristics with details of catchment contributing sources (drainage maps from major /minor irrigation development of State/or local body).
- (vi) Existing sewage treatment capacities and performance of Sewage Treatment Plants and their compliance Status
- (vii) Final mode of disposal of treated sewage as well as sludge management

➤ **Waste management in the catchment area of river: -**

- (i) Area-wise Hazardous waste generation, treatment and final mode of disposal and the existing infrastructure.
- (ii) Area-wise Status on municipal solid waste generation, treatment and final mode of disposal and the existing infrastructure
- (iii) Area-wise Status on bio-medical waste generation, treatment and final mode of disposal and the existing infrastructure
- (iv) Any other waste generation, treatment and final mode of disposal and the existing infrastructure

➤ **River catchment information**

- (i) Regulation of Flood Plain Zone
- (ii) Encroachment in Flood Plain Zone
- (iii) Plantation status
- (iv) Flow data of river/tributary

➤ **Gap Analysis and Identification of the problems in the identified polluted river catchment: -**

- (i) Sewage generation, existing infrastructure with treatment capacities and the observed gaps w.r.to infrastructure for sewage management
- (ii) Industrial effluent generation, existing infrastructure with treatment capacities and the observed gaps w.r.to infrastructure for industrial effluent management
- (iii) Waste generation, existing infrastructure with treatment capacities, designed life of the treatment and disposal facilities as applicable and the observed gaps w.r.to infrastructure for waste management
- (iv) Any other relevant issues

(Note: - All the details such as river and its tributaries, area-wise population, sources and water consumption quantities, sewage generation, existing infrastructure for sewage management and the gaps observed, area-wise industries (industry sector-wise no. of industries), sources of water and water consumption quantities (industry-sector-wise), industrial effluent generation, existing infrastructure for treatment (like Captive ETPs, CETPs), final mode of disposal of industrial effluents, waste generation and its management with existing infrastructure, characteristics of river and its tributaries, identified contaminated ground water resource areas has to be detailed in the map preferably a digital map)

D. The River Rejuvenation Action Plan:-

After having complete based information as detailed under earlier paras A to D above, Action Plans on each Activity with time-lines can be framed. The key components of action plan may follow the suggested points as given the Table below:

S. No	Key Activity and Components		Agency to perform the task	Proposed Specific Time Frame for implementation of action plan
1	Industrial Pollution Control			
	(a)	Inventorisation of water polluting industries	SPCB	
	(b)	Grant of consents	SPCB	
	(c)	Compliance verification	SPCB/ District Magistrate (DM)	
	(d)	Planning for CETP (as applicable)	SPCB+ State Industries Department or of Industries	
	(e)	Insisting on ZLD measures, recycling/reuse of treated industrial effluents	SPCB	
	(f)	Prohibition of disposal of effluents into drains except during rainy season subject to complying to effluent discharge norms for disposal in surface water.	SPCB + DM	
	(g)	Covering small and tiny units and not allowing discharge of effluents either individually or combined	SPCB+ Local Body/ Urban Body	
	(h)	Publishing list of defaulting industries in local newspapers and involving public in reporting deliberate discharges (without entering in the premises-backyard water and reporting running of industry against the closure orders.	SPCB + DM	
	(i)	Hazardous or Non Hazardous Waste Management Plan and no dumps anywhere except at identified locations	SPCB + DM	
	(j)	Reporting Non-Compliance of CGWB	SPCB +	

		conditions and closure of Non complying units.	CGWB	
	(k)	Levying compensation or fines for non-compliances as empowered to UPPCB under the Hon'ble NGT Order Dtd. 13/07/2017 in Ganga Matter in case of Tanneries.	SPCB	
	(l)	Other Action as relevant	SPCB + Concerned Agency of State	
2	Ground Water Protection			
	(a)	Declaration of Polluted Blocks	CGWB	
	(b)	Embargo on Water pollution /over-abstraction of industries as per block status	CGWB	
	(c)	Rain water harvesting	Local Body + DM	
	(d)	Identification of Geo-genic contamination (as applicable)	CGWB	
	(e)	Identification of industries discharging industrial effluent illegally and levying fine on such industries including closure of such industries	SPCB + CGWB	
	(f)	Remediation of contaminated ground water (due to discharge of industrial /sewage) with the recovered funds from the default industry	SPCB + CGWB	
	(g)	Capping of contaminated tube wells and Potable water supply through alternate measures in the affected areas of groundwater	Water Supply Department	
3	Sewage Management			
	(a)	Identification of cities, towns and villages discharging sewage into river/tributary	State Local and Urban Development and Executing Agencies	
	(b)	Identifying drains joining river and their quantification and characterizations of pollution load		
	(c)	Preparation of Detailed Project Report (DPR) for interception and diversion (I & D) of drains to sewage treatment plant (STP) for which suitable site to be identified and plan for utilization of treated sewage.		

	(d)	Execution of STP works and necessary infrastructure and ensuring household sewer connection for full utilization of STP		
	(e)	Regular cleaning of drains and prohibiting disposal of garbage/plastic and filthy material into drains including dairy waste		
	(f)	Restoration of natural drains for carrying only storm water (but not sewage)	Local and Urban Bodies + State Water Resources + State Irrigation Department + SPCB	
	(g)	Ensuring utilization of treated sewage for beneficial use such as agriculture, construction activity, washing/flushing/cleaning, industrial cooling etc.,	Local and Urban Bodies + State Irrigation Department + SPCB	
	(h)	Interception and Diversion of sewage from Drains and connectivity to STPs	Local and Urban Bodies	
4	Flood Plain Zone (FPZ) Protection			
	(a)	Demarcation of FPZ and not permitting encroachments	State Irrigation Department	
	(b)	Adopting good irrigation practices to conserve water	State Irrigation Department /DFO	
	(c)	Plantation and bio-diversity parks in FPZ	State Forest Department	
5	E-Flow			
	(a)	E-Flow determination/gauging	State Irrigation Department	
	(b)	Regulation of flow from barrages	State Irrigation Department	
6	Health Impact Assessment Reports-Treatment Services			

	(a)	Epidemiological survey in the catchment to find out water-born diseases/ health issues	State Health Department	
	(b)	Providing treatment services to the diseased persons in the catchment area		
7	Education and Awareness			
	(a)	Regular involvement of educational institutions for creating awareness and conservation programmes	State Education Department with concerned Departments	
8	Funding for execution of Action Plans			
	(a)	Pooling of financial resources of state and central assistance	State Finance Commission/ MoUD and MoWR, RD & GR	

E. Monitoring of Implementation of Action Plans for Rejuvenation of Polluted River Stretches:-

- (i) In compliance with Hon'ble NGT Order dated 20/09/2018 (OA No. 673 of 2018), State/UT Level 'River Rejuvenation Committee (RRC)' constituted firstly has to ensure timely preparation of action plans (before 20/11/2018).
- (ii) Prepared actions plans need to be submitted to CPCB for random scrutiny as well as for approvals.
- (iii) Thereafter, execution of action plans to begin and to be mentioned on monthly basis by the 'RRC' under overall supervision of the Principal Secretary (Environment) of the respective State Government or Union Territory Administration.

A model flow chart for rejuvenation of polluted river is given in **Figure 3**

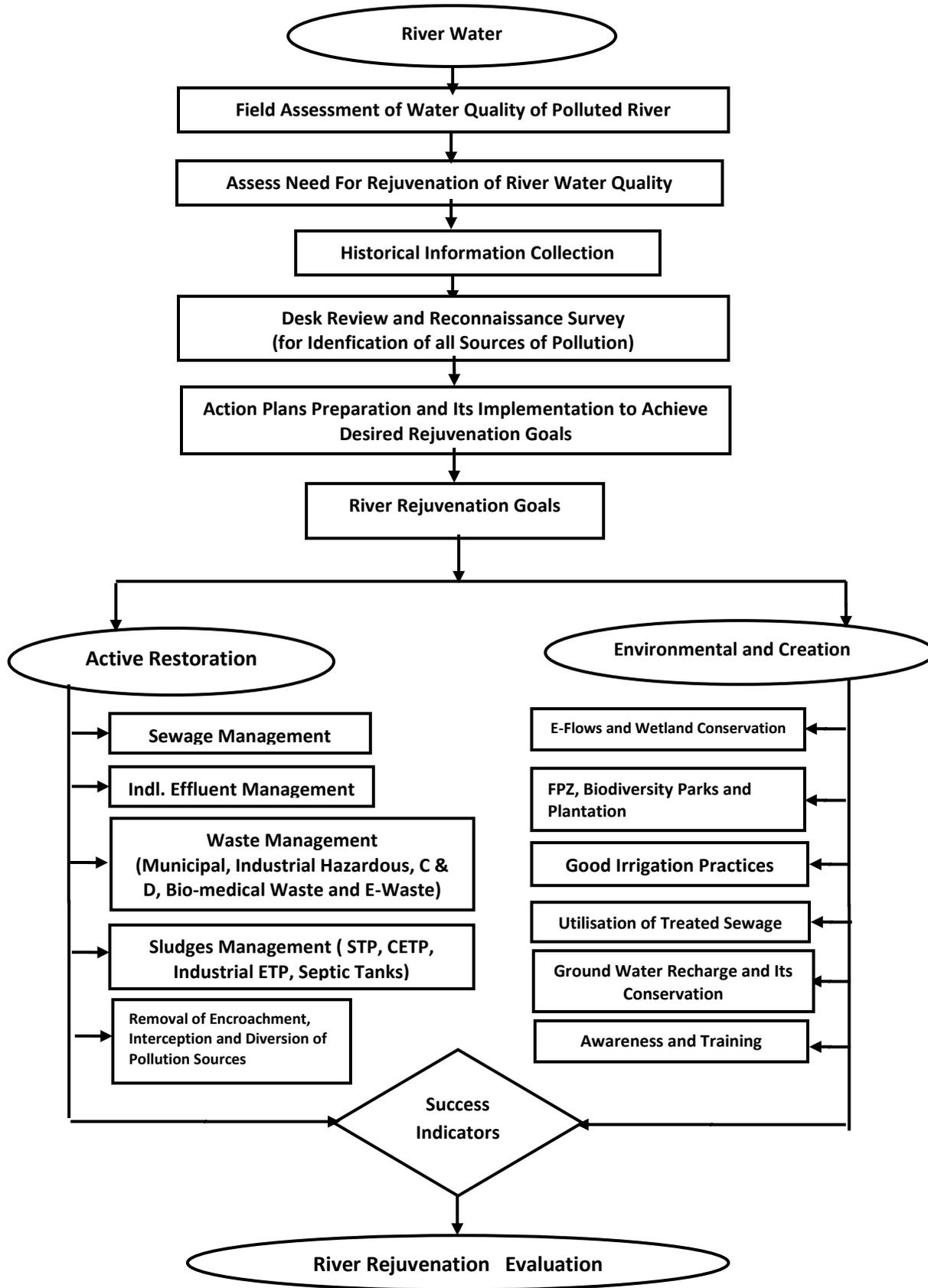


Figure 3. Model Flow Chart for Rejuvenation of Polluted Rivers

6. Sustenance Phase

Good governance, based on fairness, transparency and empowerment of all stakeholders, is essential to sustain the restoration efforts. Also, ownership of each waterbody should be decided, as most of them face indefinite sustenance due to multiplicity of administrative control and/or lack of specific action by singular authority. The in charge authority should treat the water body as 'natural resources', to act as the potential catalysts to better civic health, provide recreation, improve tourism, possibly meet water-needs of local people, etc. Such gains shall be attained only after the water bodies are treated on eco system based approach.

6.1 Awareness

Awareness for citizen's groups, resident welfare associations, local organizations, activist groups, green organizations, political organizations, educational institutions and government agencies in protection of the water bodies should be organized periodically by the concerned authorities through campaigns, electronic media in vernacular languages also be ensured by the concerned authorities

6.2 Training

Organizing periodic trainings through identified and reputed institutions for all the concerned on aspects relating to maintenance during post- restoration phase of the water body.

6.3 Promoting Public Participation

Promoting active public participation (with the help of schools, colleges and universities, NGOs) for identifying and resolving critical lake or pond problems as

well as periodic maintenance and restoration of water body from aesthetic and restoration point of view should be organized.

6.4 Dissemination of Information

Water quality of the pond or lake should be displayed at the main entrance of the pond or lake boundary and such water quality data also connected to the servers of concerned custodian State Department (s) as well as State Environment Department, respective State Pollution Control Board (SPCB)/Pollution Control Committee (PCC). Display boards also should be provided at all the salient points on '**Do's and Don'ts**' for the public.

6.5 Recreational Centre

Creation of pond or lakes can be converted into recreational centers with boating activities, walkways and benches for visitors on charge basis so as to generate revenue for operation and maintenance of the lake or pond areas

7. References

- Parliamentary Standing Committee Report 2016-“Repair, Renovation and Restoration of Water Bodies- Encroachment on Water Bodies and Steps Required to Remove the Encroachment and Restore the Water Bodies” (https://eparlib.nic.in/handle/123456789/65926?view_type=browse)
- Report of Niti Aayog (2018)- COMPOSITE WATER MANAGEMENT INDEX (CWMI) A NATIONAL TOOL FOR WATER MEASUREMENT MANAGEMENT & IMPROVEMENT <http://pibphoto.nic.in/documents/rlink/2018/jun/p201861401.pdf>
- GUIDELINES FOR REPAIR, RENOVATION AND RESTORATION OF WATER BODIES WITH DOMESTIC SUPPORT (2009)

<https://www.indiawaterportal.org/sites/indiawaterportal.org/files/Repair%2C%20Renovation%20and%20Restoration%20Water%20Bodies%20Domestic%20Support%20MoWR%202009.pdf>

- GUIDELINES FOR REPAIR, RENOVATION AND RESTORATION OF WATER BODIES WITH EXTERNAL ASSISTANCE (2009)

<https://www.indiawaterportal.org/sites/indiawaterportal.org/files/Repair%2C%20Renovation%20and%20Restoration%20Water%20Bodies%20External%20Assistance%20MoWR%202009.pdf>

- Advisory on Conservation and Restoration of Water Bodies in Urban Areas published by Central Public Health and Environmental Engineering Organization (CPHEEO), Ministry of Urban Development (August 2013)

<http://mohua.gov.in/upload/uploadfiles/files/Advisory%20on%20Urban%20Water%20Bodies.pdf>

- OA No. 200 of 2014 Titled M.C. Mehta Vs Union of India -(River Ganga) Order of HON'BLE NGT Dated 10/12/2015; and 13/07/2017.
- OA No. 231 of 214 Titled Doaba Paryavaran Samiti Vs State of UP & Ors. (on river Hindon) Order of HON'BLE NGT Dated 08/08/2018
- OA No. 673 of 2018 Titled News item published in "The Hindu" authored by Shri Jacob Koshy titled "More river stretches are now critically polluted: CPCB" Order of HON'BLE NGT Dated 20.09.2018, 19.12.2018 and 08.04.2019

-- OO --

Water Quality Criteria-Designated Best Use

Designated-Best-Use	Class of Water	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	Total Coliforms Organism in MPN/100ml shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6mg/l or more Biochemical Oxygen Demand 5 days 20C 2mg/l or less
Outdoor bathing (Organised)	B*	Faecal Coliform in MPN/100ml: 500 (desirable) and 2500 (Maximum Permissible) Faecal streptococci in MPN/100 ml: 100 (desirable) and 500 (maximum Permissible) pH between 6.5 to 8.5 Dissolved Oxygen: 5mg/l or more Biochemical Oxygen Demand 3 Day BOD, 27 ° C: 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	Total Coliforms Organism MPN/100ml shall be 5000 or less pH between 6 to 9 Dissolved Oxygen 4mg/l or more Biochemical Oxygen Demand 5 days 20C 3mg/l or less
Propagation of Wild life and Fisheries	D	pH between 6.5 to 8.5 Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling	E	pH between 6.0 to 8.5 Electrical Conductivity at 25 °C micro mhos/cm Max.2250 Sodium Absorption Ratio Max. 26 Boron Max. 2mg/l

* ***Class B as per Primary Water Quality Criteria for Bathing Water (Water Used for Organised Outdoor Bathing) as per Environment (Protection) Rules, 1986***

CRITERIA FOR CATEGORISATION OF RIVER MONITORING LOCATION

1. Introduction

Water Quality monitoring is an essential component to maintain and restore the wholesomeness of resources by way of prevention and control of pollution as prescribed under the Water (Prevention and Control of Pollution) Act, 1974. However, the Water (Prevention and Control of Pollution), Act, 1976 does not define the level of wholesomeness to be maintained or restored in different water bodies of the country. In view of the said reason, the Central Pollution Control Board (CPCB) has tried to define the wholesomeness of water in terms of safe human uses, and thus, taken human uses of water as base for identification of water quality objectives for different water bodies in the Country. It is considered ambitious to maintain or restore all natural water body at pristine level which is possible only by taking proper control measures. The level and degree of treatment required can be decided depending on the categorization of the polluted river locations/stretch, as per the criteria detailed below:-

2. Categorization of River Monitoring Location

The water quality data is required to be analyzed and primarily mean or average values of Biochemical Oxygen Demand (BOD) and Faecal Coliform (FC) need to be estimated. Then, based on the total score estimated for the parameters BOD (weightage- 70 %) and FC (Weightage- 30 %), based on the criteria, the monitoring location is categorized as 'polluted' location. The polluted monitoring locations in a continuous sequence are defined as 'polluted river stretch'. However, actual self-purification distance need to be estimated based on the requisite input parameters which depend on the case-to-case and the local conditions.

The monitoring locations may be categorized in five classes from Category I to Category –VI. i.e., critically polluted to Good or Fit for Bathing i.e., Category –I indicates 'critically polluted'; Category-II indicates 'severely polluted'; Category-III indicates 'moderately polluted', Category –IV indicates 'less polluted', Category – V indicates 'Good' or Fit for Bathing'

Above suggested criteria is intended only for categorization of the river monitoring locations. However, if any State/UT desires to identify any other water body such as lakes, tanks may also apply these criteria depending on the need and the requisite achievable goals for rejuvenation of such water bodies.

Table 1 to Table 3 gives the mean or average BOD/Faecal Coliform values or range and the corresponding scores as well as categorization of the monitoring location

Table 1. Observed Mean or Average BOD Value in mg/l and corresponding BOD Score

S. No	Mean or Average BOD (Weightage-70 %)	
	Mean or Average BOD (in mg/l)	BOD Score (X)
1	> 48	100
2	24-48	80
3	12-24	60
4	6-12	40
5	≤ 6	20

Table 2. Observed Mean or Average Faecal Coliform (in MPN/100 ml) and corresponding FC Score

S. No	Mean or Average Faecal Coliform (Weightage -30 %)	
	Mean or Average Faecal Coliform (in MPN/100 ml)	FC Score (Y)
(1)	> 5,00,000	100
(2)	5000 to 5,00,000	80
(3)	5000 to 50,000	60
(4)	500 to 5000	40
(5)	≤500	20

Table 3. Total Score and corresponding Category of River Monitoring Location

S. No	Total Score* (Z')	Category Priority Class of the Monitoring location	Category of Monitoring location
(1)	81-100	Category -I	Critically Polluted
(2)	61-80	Category--II	Severely Polluted
(3)	41-60	Category -III	Moderately Polluted
(4)	21-40	Category -IV	Less Polluted
(5)	≤ 20	Category -V	Good or Fit For Bathing

Note:

- (i) *Above criteria must be considered only for the river locations having monitored at least for 2 years and 8 observations in each year covering at least pre-monsoon and post-monsoon period;*

- (ii) *Above criteria is a preliminary screening criteria for categorizing monitoring locations. However, comprehensive assessment needs to be done by States/UTs to arrive at the extent of contamination;*
- (iii) *Please refer to the procedure for estimation of Total Score given in S.No 3.;*

- 2.1 Criteria for Category- I – Critically Polluted:** - If the Total score is 81-100, then the monitoring location is categorized as '**Critically Polluted**'.
- 2.2 Criteria for Category- II – Severely Polluted:** - If the Total score is 61-80, then the monitoring location is categorized as '**Severely Polluted**'
- 2.3 Criteria for Category- III-Moderately Polluted:** - If the Total score is 41-60, then the monitoring location is categorized as '**Moderately Polluted**'
- 2.4 Criteria for Category-IV –Less Polluted:** - If the Total score is 21-40, then the monitoring location is categorized as '**Less Polluted**'.
- 2.5 Criteria for Category -V-Good or Fit for Bathing:-**If the Total score is ≤ 20 , then the monitoring location is categorized as '**Good or Fit for Bathing**'.

*For easy understanding, flow chart given in **Figure 4** and steps for calculating the total score may also be referred in the subsequent paras:-*

- 3. Steps for calculating total score and categorizing of monitoring location : -**
 - (i) *Depending on the average BOD measured value, assign the BOD score (X) as given in **Table 1**.*
 - (ii) *Similarly depending on the average FC measured value, assign the FC Score (Y) as given in **Table 2**.*
 - (iii) *Total score (**Z**) is estimated as: BOD Score (**X**) X (Weightage of BOD i.e., 70 %) + FC Score (**Y**) X (Weightage for FC i.e., 30 %). and*
 - (iv) *Now compare calculated Total Score (Z) with the **Z'** Value given in the **Table 3** and the monitoring location is categorized suitably.*

For easy understanding following examples may be referred in the subsequent paras.

E.g. (1): At a particular monitoring location, the average values of BOD and the FC values are observed as 6 mg/l and 9000 MPN/100 ml respectively. Then, the total score is calculated as

- X is the BOD Score corresponding to the mean BOD value of 6 mg/l as per **Table 1** = 20
- Y is the FC Score corresponding to the average FC value of 9000 MPN/100 ml as per **Table 2** = 60
- Calculated Total Score (**Z**) = **X X Weightage of BOD + Y X Weightage of FC** i.e., $20 \times 0.7 + 60 \times 0.3 = 14 + 18 = 32$.
- Compare 39 value with the **Z'** values given in **Table 3** to decide on the *Priority* Category of the Monitoring Location. In this case, monitoring location is Category-IV i.e., 'Less Polluted',

E.g.(2): At a particular monitoring location, the average value of BOD and the FC values are observed as 2 mg/l and 45 MPN/100 ml respectively. Then, the total score is calculated as

- X is the BOD Score corresponding to the average BOD value of 2 mg/l as per **Table 1** = 20
- Y is the FC Score corresponding to the average FC value of 45 MPN/100 ml as per **Table 2** = 20
- Calculated Total Score (**Z**) is calculated as = **X X Weightage of BOD + Y X Weightage of FC** i.e., $20 \times 0.7 + 20 \times 0.3 = 20$
- Compare 20 value with the **Z'** values given in **Table 3** to decide on the Category of the Monitoring Location. In this case, monitoring location is Category-V i.e., 'Good' or Fit for Bathing

E.g. (3): At a particular monitoring location, the average value of BOD and the FC values are observed as 2 mg/l and 550000 MPN/100 ml respectively. Then, the total score is calculated as

- X is the BOD Score corresponding to the average BOD value of 2 mg/l as per **Table 1** = 20

- *Y is the FC Score corresponding to the average FC value of 550000 MPN/100 ml as per **Table 2** = 100*
- *Calculated Total Score (**Z**) = **X** X **Weightage of BOD** + **Y** X **Weightage of FC** i.e., $20 \times 0.7 + 100 \times 0.3 = 44$.*
- *Compare 100 value with the **Z'** values given in **Table 3** to decide on the Category of the Monitoring Location. In this case, monitoring location is Category-III i.e., Moderately Polluted'*

E.g.(4): *At a particular monitoring location, the average value of BOD and the FC values are observed as 45 mg/l and 400 MPN/100 ml respectively. Then, the total score is calculated as*

- *X is the BOD Score corresponding to the average BOD value of 45 mg/l as per **Table 1** = 80*
- *Y is the FC Score corresponding to the average FC value of 400 MPN/100 ml as per **Table 2** = 20*
- *Calculated Total Score (**Z**) = **X** X **Weightage of BOD** + **Y** X **Weightage of FC** i.e., $80 \times 0.7 + 20 \times 0.3 = 62$.*
- *Compare 100 value with the **Z'** values given in **Table 3** to decide on the Category of the Monitoring Location. In this case, monitoring location is 'Category-II i.e., Severely Polluted'*

E.g (5): *At a particular monitoring location, the average values of BOD and the FC values are observed as 24 mg/l and 200000 MPN/100 ml respectively. Then, the total score is calculated as*

- *X is the BOD Score corresponding to the mean BOD value of 24 mg/l as per **Table 1** = 60*
- *Y is the FC Score corresponding to the average FC value of 200000 MPN/100 ml as per **Table 2** = 80*
- *Calculated Total Score (**Z**) = **X** X **Weightage of BOD** (70 %) + **Y** X **Weightage of FC** (30 %) i.e., $60 \times 0.7 + 80 \times 0.3 = 42 + 24 = 66$.*
- *Compare 90 value with the **Z'** values given in **Table 3** to decide on the Category of the Monitoring Location. In this case, monitoring location is Category-II i.e., 'Severely Polluted',*

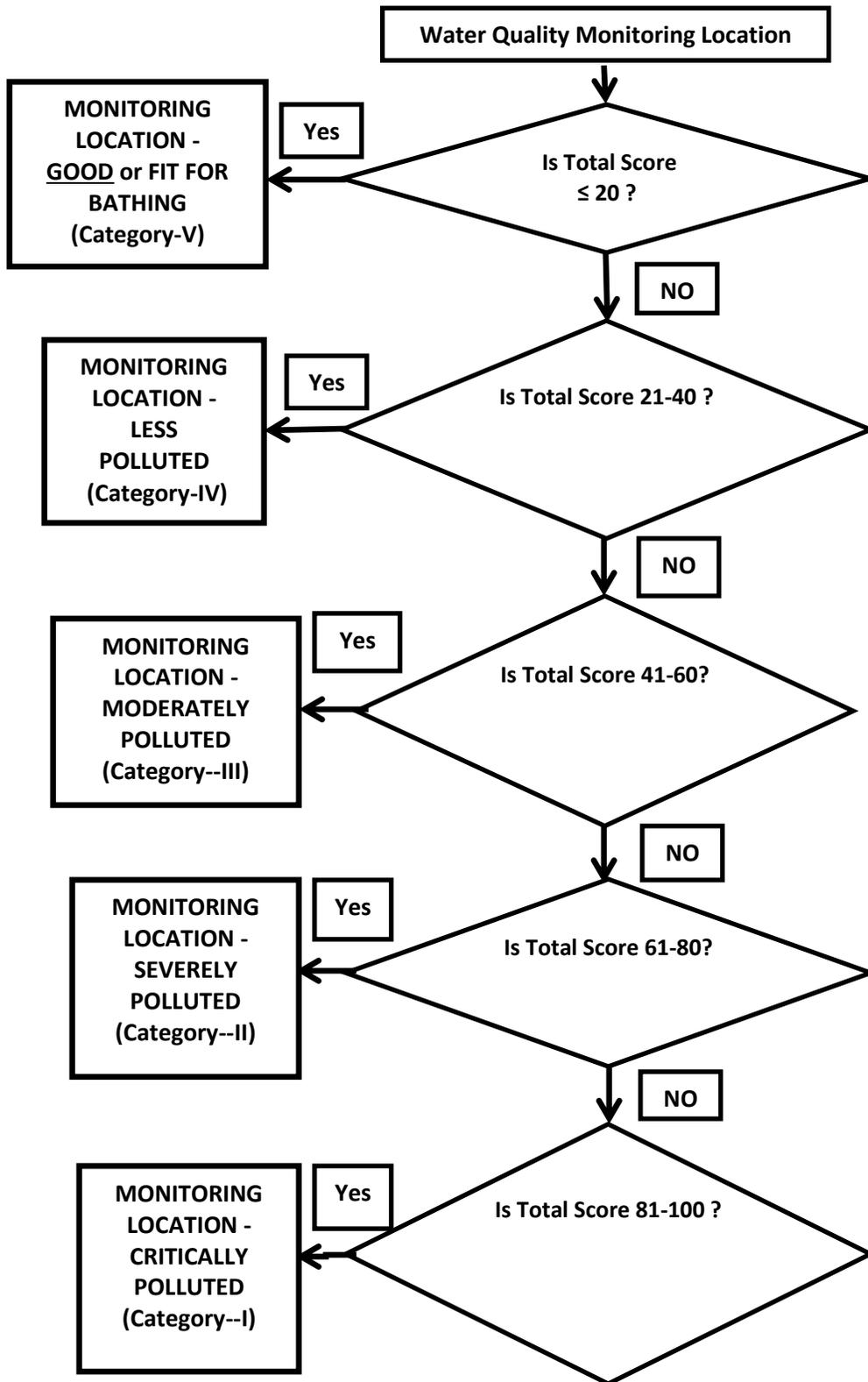


Figure 4. Flow Chart Showing Criteria for Categorization of River Monitoring Location

F No- A-14011/1/2019-WQM-I 2635-2676

To

PS to Chief Secretary,
All State Govt. /UT Admin**Sub: Hon'ble NGT order dated 10.5.2019 in M.A. No 26/2019 in O.A. No. 325/2015 in the matter of Lt. Col. Sarvadaman Singh Oberoi Vs UOI & Ors**

Sir,

Kindly refer to Hon'ble NGT order dated 10.5.2019 in O. A. No 325 of 2015 and directions of Hon'ble NGT at Para 13 is reproduced as follows: "we direct all the States and UTs to review the existing framework of restoration all the water bodies by preparing an appropriate action plan. Such action plans may be prepared within three months and a report furnished to the CPCB. The CPCB may examine all such plans and furnish its comments to this Tribunal within two months thereafter."

In pursuance to Hon'ble NGT order in the aforesaid matter, CPCB has prepared Guidelines for restoration of water bodies and same is uploaded in CPCB website at (<http://cpcb.nic.in/NGTMC/Ind-Guidelines-RestWaterBodies-10062019.pdf>)

In this regard, it is requested to kindly arrange to send the action plan prepared for restoration of water bodies falling in jurisdiction of your State/ UT to CPCB in compliance to Hon'ble NGT order dated 10.5.2019.

Yours faithfully,


(A. Sudhakar)
DH, WQM-I Division

Copy to:

1. The Member Secretary, : for necessary action, please
SPCBs/PCCs
2. Regional Director, : for information & follow-up with SPCBs/PCCs, please
(All RDs)
3. PS to MS : for information of 'MS', please
4. LO, CPCB : for information, please

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
दिनांक.....
दिनांक.....
19/06/19

(A. Sudhakar)

- | | |
|--|---|
| <p>1. Regional Director,
Central Pollution Control Board
Regional Directorate (South)
1st Floor, Nisarga Bhawan,
A-Block, Thimmaiah
Road, 7th D cross,
Shivnagar, Opp Pushpanjali
Theatre, Bengaluru 560079</p> <p>2. Regional Director,
Central Pollution Control Board
Regional Directorate – Shillong
“TUM-SIR”. Lower Motinagar,
Near Fire Brigade H.Q.,
Shillong, Meghalaya-793014</p> <p>3. Regional Director,
Central Pollution Control Board
Regional Directorate- Kolkata
Southend Conclave, Block 502,
5th & 6th Floors, 1582 Rajdanga Main Road
Kolkata - 700 107</p> | <p>4. Regional Director,
Central Pollution Control Board
Regional Directorate – Bhopal
3rd Floor, Sahkar Bhawan, North TT Nagar,
Bhopal - 462003</p> <p>5. Regional Director,
Central Pollution Control Board
Regional Directorate - Vadodara
Parivesh Bhawan,Opp. VMC Ward Office No.
10,
Subhanpura, Vadodara-390 023</p> <p>6. Regional Director,
Regional Directorate - Lucknow
PICUP Bhawan, Vibhuti Khand,
Gomti Nagar, Lucknow– 226010</p> |
|--|---|

- | | |
|--|--|
| 1. PS to Chief Secretary,
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Dispur - 781006, Guwahati | 11. PS to Chief Secretary,
Government of Andhra Pradesh
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A.P Secretariat Office,
Velagapudi - 522503 |
| 2. PS to Chief Secretary,
Government of Manipur
South Block, Old Secretariat
Imphal-795001 | 12. PS to Chief Secretary,
Government of Bihar
Main Secretariat, Patna - 800015 |
| 3. PS to Chief Secretary,
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Naya Raipur - 492002 |
| 4. PS to Chief Secretary,
Delhi Secretariat,
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Government of Goa Secretariat,
Porvrom, Bardez, Goa - 403521 |
| 5. PS to Chief Secretary,
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Meghalaya Secretariat,
Shillong - 793001 | 15. PS to Chief Secretary,
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Gandhinagar - 382010 |
| 6. PS to Chief Secretary,
Government of Nagaland
Civil Secretariat,
Kohima-797004 | 16. PS to Chief Secretary,
Government of Himachal Pradesh
H P Secretariat, Shimla -171002 |
| 7. PS to Chief Secretary,
Government of Tamil Nadu
Secretariat, Chennai - 600009 | 17. PS to Chief Secretary,
Government of Jammu & Kashmir
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Civil Secretariat, Jammu - 180001 |
| 8. PS to Chief Secretary,
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4 Subhash Road, Uttarakhand Secretariat
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Civil Secretariat, Srinagar - 190001 |
| 9. PS to Chief Secretary,
Secretariat, Moti, Silvasa,
Daman - 396220 | 19. PS to Chief Secretary,
Government of Jharkhand
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Dhurwa, Ranchi- 834004 |
| 10. PS to Chief Secretary,
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Sector-1, Chandigarh - 160019 | 20. PS to Chief Secretary,
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- | | |
|--|---|
| 21. PS to Chief Secretary,
Government of Kerala
Secretariat, Thiruvananthapuram - 695001 | 28. PS to Chief Secretary,
Government of Rajasthan
Secretariat, Jaipur - 302005 |
| 22. PS to Chief Secretary,
Government of Madhya Pradesh
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Bhopal - 462004 | 29. PS to Chief Secretary,
Government of Sikkim
New Secretariat,
Gangtok - 737101 |
| 23. PS to Chief Secretary,
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Hyderabad, Telangana - 500022 |
| 24. PS to Chief Secretary,
Government of Mizoram
New Secretariat Complex,
Aizwal - 796001 | 31. PS to Chief Secretary,
Government of Tripura
Agartala West Tripura
New Secretariat Complex
Secretariat-799010 |
| 25. PS to Chief Secretary,
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General Administration Department
Odisha Secretariat, Bhubaneswar - 751001 | 32. PS to Chief Secretary,
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Shibpur, Howrah - 711102 |
| 26. PS to Chief Secretary,
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Puducherry - 605001 | 33. PS to Chief Secretary,
Raj Bhawan, Chandigarh |
| 27. PS to Chief Secretary,
Government of Punjab
Chief Secretary Office,
6th Floor, Punjab Civil Secretariat -1,
Sector 1, Chandigarh, 160001 | 34. PS to Chief Secretary,
Andaman and Nicobar Administration
Secretariat, Port Blair - 744101 |
| | 35. PS to Chief Secretary,
Government of Arunachal Pradesh
Civil Secretariat, Itanagar - 791111 |
| | 36. PS to Chief Secretary,
Lakshadweep, Kavaratti - 682555 |

<p>1. The Member Secretary, Assam Pollution Control Board, Bamunimaidam, Guwahati – 781021</p> <p>2. The Member Secretary, Manipur Pollution Control Board, Lamphelpat, Imphal West D.C. Office Complex Imphal– 795004</p> <p>3. The Member Secretary, Uttar Pradesh Pollution Control Board, Building.No. TC-12V, Vibhuti Khand, Gomti Nagar, Lucknow-226 010</p> <p>4. The Member Secretary, Delhi Pollution Control Committee, Government of N.C.T. Delhi 4th Floor, ISBT Building, Kashmere Gate, Delhi-110006</p> <p>5. The Member Secretary, Meghalaya Pollution Control Board Arden- Lumpyngngad Shillong: 793014</p> <p>6. The Member Secretary, Nagaland Pollution Control Board, Signal Point, Dimapur Nagaland – 797112</p> <p>7. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032</p> <p>8. The Member Secretary, Uttarakhand Environmental Protection & Pollution Control Board, 29/20, Nemi Road, Dehradun, Uttarakhand – 248001</p> <p>9. The Member Secretary, Daman, Diu & Dadra Nagar Haveli Pollution Control Committee, Office of the Deputy Conservator of Forests, Fort Area, Court Compound, Moti Daman, Daman – 396220</p> <p>10. The Member Secretary,</p>	<p>11. The Member Secretary, Andhra Pradesh Pollution Control Board D.No. 33-26-14 D/2, Near Sunrise Hospital, Pushpa Hotel Centre, Chalamalavari Street, Kasturibaipet, Vijayawada – 520 010</p> <p>12. The Member Secretary, Bihar State Pollution Control Board, Parivesh Bhawan, Plot No. NS-B/2 Paliputra Industrial Area, Patliputra, Patna (Bihar) - 800 010</p> <p>13. The Member Secretary, Chhattisgarh Environment Conservation Board, Paryavas Bhavan, North Block Sector-19, Atal Nagar Dist- Raipur (C.G.) 492002</p> <p>14. The Member Secretary, Goa State Pollution Control Board, 1st Floor, Dempo Tower, EDC Patto Plaza, Panaji, Goa-403 001</p> <p>15. The Member Secretary, Gujarat Pollution Control Board Paryavan Bhavan, Sector 10- A, Gandhinagar – 382 043</p> <p>16. The Member Secretary, Himachal Pradesh Pollution Control Board, Him Parivesh, Phase-III, New Shimla, Himachal Pradesh 171009</p> <p>17. The Member Secretary, Jammu & Kashmir State Pollution Control Board, Parivesh Bhawan, Forest Complex, Gladni, Narwal, transport Nagar, Jammu, Jammu and Kashmir 180004</p> <p>18. The Member Secretary, Jammu & Kashmir State Pollution Control Board, Shiekh-ul-Campus, behind Govt. Silk Factory, Raj Bagh, Srinagar (J&K)</p> <p>19. The Member Secretary, Jharkhand Pollution Control Board, T.A Building, HEC, P.O. Dhurwa, Ranchi – 834004</p> <p>20. The Member Secretary, Karnataka State Pollution Control Board, Parisara Bhavan, 4th & 5th Floor,</p>
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| <p>Haryana State Pollution Control Board,
C-11, Sector-6, Panchkula-134109,
Haryana</p> <p>21. The Member Secretary,
Kerala State Pollution Control Board,
Plamoodu Jn., Pattom Palace P.O.
Thiruvananthapuram - 695 004</p> <p>22. The Member Secretary,
Madhya Pradesh Pollution Control Board,
E-5, Arera Colony, ParyavaranParisar,
Bhopal - 462 016, Madhya Pradesh</p> <p>23. The Member Secretary,
Maharashtra Pollution Control Board,
Kalpataru Point, 2nd - 4th Floor
Opp. Cine Planet Cinema,
Nr. Sion Circle, Sion (E)
Mumbai - 400 022</p> <p>24. The Member Secretary,
Mizoram Pollution Control Board,
New Secretariat Complex,
KhatlaThlanmualPeng,
Khatla, Aizawl, Mizoram: 796001</p> <p>25. The Member Secretary,
Odisha Pollution Control Board,
A-118, Nilakanta Nagar, Unit -VIII,
Bhubaneshwar - 751012</p> <p>26. The Member Secretary,
Puducherry Pollution Control Committee,
Housing Board Complex, Anna Nagar,
Puducherry -600 005</p> <p>27. The Member Secretary,
Punjab Pollution Control Board,
Vatavaran Bhawan, Nabha Road,
Patiala, Punjab</p> <p>28. The Member Secretary,
Rajasthan Pollution Control Board,
4, Jhalana Institutional Area,
Jhalana Doongri,
Jaipur (Rajasthan) - 302 004</p> | <p># 49, Church St., Bengaluru-560 001</p> <p>29. The Member Secretary,
Sikkim State Pollution Control Board,
Department of Forest,
Environment & Wildlife Management
Government of Sikkim,
Deorali, Gangtok, -737102</p> <p>30. The Member Secretary,
Telangana State Pollution Control Board,
Paryavaran Bhawan, A-3, I.E. Sanath Nagar,
Hyderabad-500 018</p> <p>31. The Member Secretary,
Tripura Pollution Control Board,
Vigyan Bhawan, Pandit Nehru Complex,
Gorkhabasti, PO: Kunjaban Agartala - 799006</p> <p>32. The Member Secretary,
West Bengal Pollution Control Board,
Paribesh Bhavan, 10A, Block-L.A.,
Sector III, Salt Lake City,
Kolkata - 700 106</p> <p>33. The Member Secretary,
Lakshadweep Pollution Control Committee,
Department of Science, Technology &
Environment,
Kavarati- 682555</p> <p>34. The Member Secretary,
Arunachal Pradesh State Pollution Control
Board,
Paryavaran Bhawan, Papu Hill, Yupia Road,
Naharlagun- 791110</p> <p>35. The Member Secretary,
Andaman & Nicobar Islands Pollution Control
Committee,
Department of Science & Technology,
Dollygunj Van Sadan, Haddo P.O., Port
Blair - 744102</p> <p>36. The Member Secretary,
Chandigarh Pollution Control Committee,
Paryavaran Bhawan, Ground Floor, Sector 19 B
Madhya Marg, Chandigarh</p> |
|--|---|

26.07.2019

F.No.A-14011/1/2019-WQM-I 4470-4512

To

The Chief Secretary

(Andhra Pradesh, Andaman & Nicobar Island, Arunachal Pradesh, Assam, Bihar, Chhatisgarh, Daman, Diu And Dadra Nagar Haveli, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Lakshadweep, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Puducherry, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, Uttar Pradesh, Uttarakhand, West Bengal)

Sub: M.A. No 26/2019 in OA No 325/2015 in the matter of Lt. Col. Sarvadaman Singh Oberoi Vs UOI & Ors before Hon'ble NGT, PB New Delhi

Sir,

Kindly refer to order passed by Hon'ble NGT (PB), New Delhi on 10.05.2019 in OA No 325/2015 in the matter of Lt. Col. Sarvadaman Singh Oberoi Vs UOI & Ors wherein *State Govt./UT administration were directed for taking necessary action for restoration of all water bodies by preparing action plan within three month in compliance to afore-said Hon'ble NGT order.* (Please refer to CPCB website <https://cpcb.nic.in/NGTMC/NGT-order-dated-10052019.pdf>).

CPCB vide letter dated 18.06.2019 already informed about indicative guidelines for restoration of water bodies, which is available on website at <https://cpcb.nic.in/NGTMC/Ind-Guidelines-RestWaterBodies-10062019.pdf>. It was also requested for submission of action plan for restoration of water bodies within 3 months, or before 09.08.2019.

In view of the above, I am directed to kindly remind about taking necessary action and to arrange for providing finalized action plans on or before 09.08.2019 to CPCB for review please.

Yours faithfully,


(B. Vinod Babu)

Member Secretary

o/c

Copy to:

1. Member Secretary, (All SPCBs/PCCs) : For kind information and necessary action, please
2. All RDs : For information, follow- up with the concerned SPCBs/PCCs, please
Shillong, Kolkata, Bengaluru, Bhopal, Vadodara,
Lucknow, Chandigarh, Chennai & Pune
3. Law Officer, Law Section ,CPCB : For information and record please


(B. Vinod Babu)

o/c

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
दिनांक 29/7/19
दिनांक 29/7/19

A/31/6/19

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216

Annexure- III

केन्द्रीय प्रदूषण नियंत्रण बोर्ड

CENTRAL POLLUTION CONTROL BOARD

पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार.

MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE, GOVT. OF INDIA.

Speed-post/ Email

Reminder-I

F. No. A-14011/2026-WQM-I/6

Dated: 07.01.2026

To

The Member Secretary,
Uttar Pradesh Pollution Control Board
Building. No. TC-12V
Vibhuti Khand, Gomti Nagar
Lucknow-226 010 (Uttar Pradesh)
ms@uppcb.in

Sub: Compliance of Hon'ble NGT (PB) order dated 14.11.2025 in the matter of OA No. 524/2025 titled as "Ramlal Singh versus State of Uttar Pradesh & Ors."

Reference: CPCB's letter F. No. A-14011/2025-WQM-I/ 274 dated 08.12.2025.

Sir,

Kindly refer to our earlier letter dated 08.12.2025, wherein it has been requested to provide the comments/ status in the matter of OA No. 524/2025 titled as "Ramlal Singh versus State of Uttar Pradesh & Ors." (copy of NGT order dated 14.11.2025 and CPCB letter dated 08.12.2025 are attached with email for ready reference).

It is requested to kindly provide the aforesaid information at the earliest.

Yours faithfully

(Nazimuddin)

Divisional Head, WQM-I

Encl.: As above

'परिवेश भवन' पूर्वी अर्जुन नगर, दिल्ली - 110032.

Parivesh Bhawan, East Arjun Nagar, Delhi - 110 032.

दूरभाष /Tel : 43102030, 22305792, वेबसाइट /Website: www.cpcb.nic.in

Speed Post/ E-mail

F. No. A-14011/2025-WQM-I/ 1274

Dated: 08.12.2025

To

**The Member Secretary,
Uttar Pradesh Pollution Control Board**
Building. No. TC-12V
Vibhuti Khand, Gomti Nagar
Lucknow-226 010 (Uttar Pradesh)
ms@uppcb.in

Sub: Compliance of Hon'ble NGT (PB) order dated 14.11.2025 in the matter of OA No. 531/2025 titled as "Ramlal Singh versus State of Uttar Pradesh & Ors."

Sir,

Enclosed please find a copy of Hon'ble NGT (PB) order dated 14.11.2025 in the matter of OA No. 531/2025 titled as "Ramlal Singh Versus State of Uttar Pradesh & Ors."

It is requested to provide the comments/ status in the said matter at earliest for CPCB's appropriate reply in OA No. 531/2025.

Yours faithfully



(Nazimuddin)

Divisional Head, WQM-I

Encl.: As above

'परिवेश भवन' पूर्वी अर्जुन नगर, दिल्ली - 110032.

Parivesh Bhawan, East Arjun Nagar, Delhi - 110 032.

दूरभाष /Tel : 43102030, 22305792, वेबसाइट /Website: www.cpcb.nic.in