HARYANA POND AND WASTE WATER MANAGEMENT AUTHORITY

ADMINSTRATIVE REPORT FOR THE FINANCIAL YEAR 2019-2020 & 2020-2021

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A: Explanatory Memorandum

Water is by far the most important natural resource on earth. Today, nearly 2.2 billion people don't have access to it. India is home to 18% of the global population but it has only 4% of the global water resources.

Haryana once known for its overflowing canals and **vibrant ponds** currently grapples with a severe water crisis due to several factors like over-extraction & insufficient replenishment of groundwater, climate change, and water logging. The State is, therefore, witnessing the advent of a large portion of water stressed and water parched areas. The ground water levels in Haryana range from 0 – 30 meters. The demand for water (34 BCM) far exceeds the available supply (20 BCM), resulting in a staggering **water gap of 14 BCM**. This crisis not only threatens our agricultural productivity but also sows the seeds for potential conflict. History teaches us that water scarcity can be a source of tension, both within and among communities.

Thus, with rising concerns over dwindling water resources, the Government of Haryana has undertaken a number of initiatives including the formation of the Haryana Pond and Waste Water Management Authority in 2018 through the **"Pond and Waste Water Management Authority Act , 2018".** Its vision is to promote/monitor the development, protection, rejuvenation, conservation, construction and management of ponds & utilization of pond water after treatment and for management and utilization of treated effluent of sewage effluent treatment plants for the purpose of irrigation, thereby reducing stress of over exploitation of ground water and for matters connected therewith or incidental thereto. Its scope is to repair / restore / rejuvenate the ponds along with development of periphery of the pond with greenery and to preserve the aquatic life of ponds for conservation of bio-diversity.

Ponds are vital resources of the environment. They act like sponges, soaking up rainwater and replenishing groundwater reserves. This stored water is a lifesaver during dry periods and helps communities facing water scarcity. Additionally, during heavy rains, they act as buffers, absorbing excess water and preventing floods that can devastate lives and property. This flood mitigation also protects valuable top soil from erosion, keeping it fertile for agriculture – the backbone of our rural communities.

These calm bodies of water also provide **Habitat to the Biodiversity**. Plants, fish, insects, and amphibians all call ponds home, making them vital for biodiversity conservation. With healthy pond ecosystems, the nature thrives. The benefits of healthy ponds extend far beyond the immediate surroundings. They provide a **reliable source of water for irrigation**, allowing farmers to grow crops and improve their livelihoods. Additionally, ponds can be used for aquaculture, providing a source of food and income for local communities.

In a nutshell, ponds are nature's way of promoting water conservation, flood control, healthy ecosystems, and thriving communities. They're a powerful tool for achieving the UN's Sustainable Development Goals, particularly **SDG 6:** ensuring clean water and sanitation **for all.** All the benefits discussed hereunder are no intervention but old traditional wisdom realized.

B: About the Haryana Pond and Waste Water Management authority (HPWWMA)

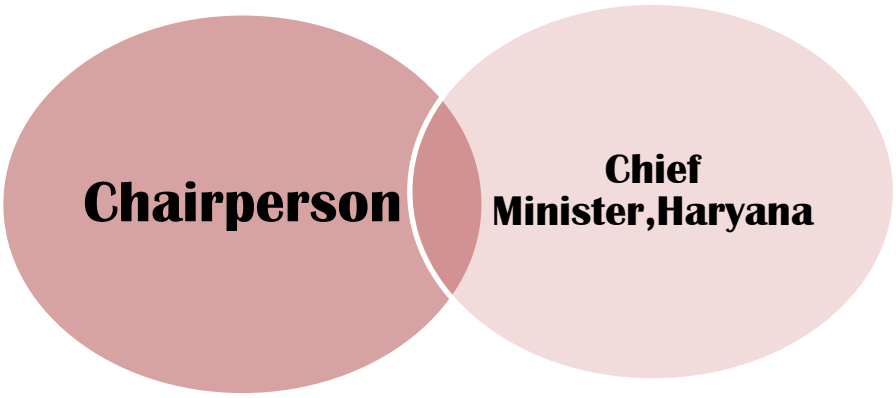
The Government of Haryana under the provisions of Haryana Pond and Waste Water Management Authority Act 2018 has established an Authority in the State for development, protection, rejuvenation, conservation, construction and management of pond, utilization of pond water and treatment thereof and for management and utilization of treated effluent of sewage effluent treatment plants for the purpose of irrigation, thereby reducing stress of over exploitation of ground water and for matters connected therewith or incidental thereto.

Legislative Work

i. **The Haryana Pond and Waste Water Management Authority Act, 2018 (Act No. 33 of 2018):** This is the foundational Act that establishes the HPWWMA, outlining its objectives, composition, powers, and functions. It defines key terms like "pond" and sets the stage for the Authority's work in managing ponds and wastewater.

ii. **Haryana Pond and Waste Water Management Authority (Amendment) Act, 2020 (Haryana Act No. 8 of 2020):** This amendment act introduces changes to the original 2018 Act.

Constitution of Authority:-



Senior Vice-Chairperson	Minister In-charge,Irrigation and Water Resources Department
Senior Vice-Chairperson	Minister In-charge,Development and Panchayats Department
Executive Vice-Chairperson	Shri. Prabhaker Verma
Technical Advisor	Shri.Ravi Kant Uppal
Member Secretary	Vacant

This is followed by 10 Members from various Departmnets , 2- Non official members and 1 -Member Secretary. Detailed Annexure is Attached for Refrence .

The Powers and Functions of the Authority:-

(i) to enter into pond land, green belt and catchment area to perform its functions;
(ii) to receive grants, donations, contributions and rents;
(iii) to levy fee or charges;
(iv) to receive Corporate Social Responsibility funds from private organizations;
(v) to grant administrative approval for execution of projects;
(vi) to release funds to village level committee on the recommendation of the district level committee;
(vii) Any other power, as may be assigned by the Government.
(viii) The organization of the Authority shall have Establishment, Engineering, Accounts and Legal sections.
(ix) Redefine water uses of pond or treated effluent of sewage treatment plant or effluent treatment plant, from time to time.
(x) Grant permission for any of the above prohibited uses, in public interest with the prior concurrence of the Government.
(xi) Direct the Gram Panchayat or Municipality to remove any building, structure or any other object of obstruction within the protected area and pond land.
(xii) The Authority shall be consulted at the time of preparation of spatial or development plan of any area comprising a pond or protected area and no spatial or development plan in respect of such area shall be approved or enforced without prior approval of the Authority.

C: Key Focus Areas of HPWWMA

The Haryana Pond and Waste Water Management Authority (HPWWMA) was established in 2018 with a focus on the following key areas:

- **Development, Protection, Rejuvenation, Conservation, Construction and Management of ponds:** This includes activities like repairing and restoring ponds, developing greenery around them, and preserving aquatic life.

- **Utilization of pond water and treatment thereof:** The HPWWMA promotes the use of treated pond water for irrigation purposes, reducing the stress on groundwater resources.

- **Community Participation:** The HPWWMA encourages the involvement of local communities in the protection and management of ponds.

By focusing on these areas, the HPWWMA aims to improve water management in Haryana, conserve water resources, and promote the ecological benefits of healthy ponds.

D: Landmark Achievements

Haryana holds a significant pond wealth. These water bodies serve as lifelines for agriculture, irrigation, and groundwater recharge, playing a crucial role in the state's water security. However, rapid urbanization, agricultural practices, and unsustainable development have exacerbated pond degradation, impacting water availability and ecological balance. Therefore, Annual Action Plans are being implemented to restore ponds.

As per Action Plans, ponds are being Restored & Rejuvenated through most sustainable, scientific as well as Environment / eco-friendly methodologies which have been decided based on advice obtained from various **Subject matter experts**. The time period has also been assigned to each activity after due deliberations with the respective field officers.

The Haryana Pond and Waste Water Management Authority (HPWWMA) focuses on managing and rejuvenating ponds and wastewater flowing into the ponds across the state. The ponds' data under 21 parameters is uploaded on PDMS, which is Available in the public domain as Pond Atlas on the website of the Authority (www.hpwwma.org.in).

This website provides extensive resources and updates on the various activities done by HPWWMA, including ongoing activities, tenders and notices for various services like maintenance and equipment supply.

Figure 1: Website of HPWWMA

Ponds, whether natural or man-made, play a crucial role in various ecosystems. Database-driven pond profiling offers a powerful tool for efficient and insightful pond management. By harnessing the power of data collection, analysis, and visualization, a deeper understanding of these vital resources can be gained.

1. Pond Data Management System (PDMS) Portal

The Authority has collected data, of all the ponds of the entire State located on the Government land on the Pond Data Management System (PDMS) Portal, which is available in public domain. The Pond Data Management System (PDMS), **a digital platform** that tracks and monitors the status of ponds in Haryana. This platform categorizes ponds based on size, condition, and usage, and provides detailed reports on each pond. PDMS's goal is to facilitate better management and restoration efforts with regards to Ponds' Management.

- **Geo-mapping and Geo-tagging** have also been done for all the Ponds including those ponds that existed during post independence time.

Figure.2: Geo Mapping of Kurukshetra District, Ismailabad Block, Ajrana Khurd Village, On Phirni pond

The monitoring of various activities of pond execution is carried out against the pre decided benchmark durations. Given below is a Figure (Figure. 3) depicting the time periods allotted to each activity in order to restore ponds.

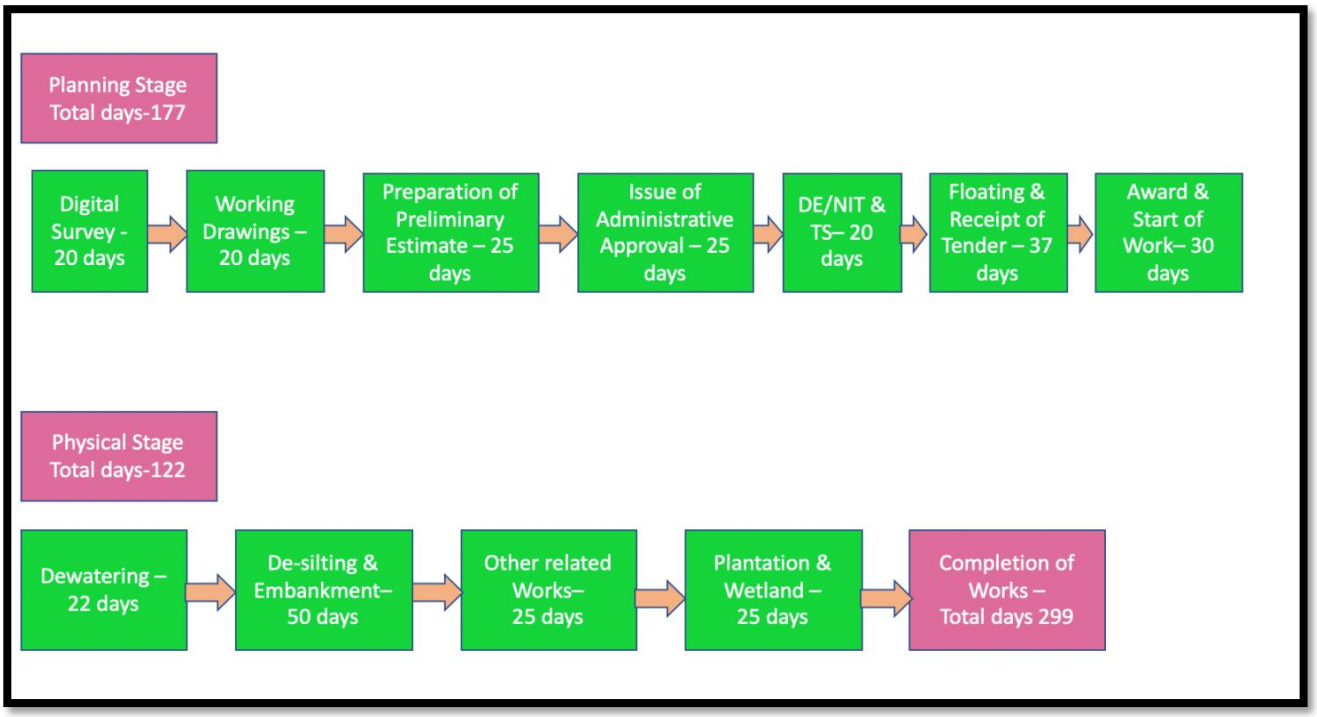


Figure.3: **Time Schedule and Activities for Pond Restoration**

2. Prioritization of ponds

For restoring the ponds, the first step is to classify them according to the priority. Ponds need to be classified according to the priority it demands so as to manage them effectively.

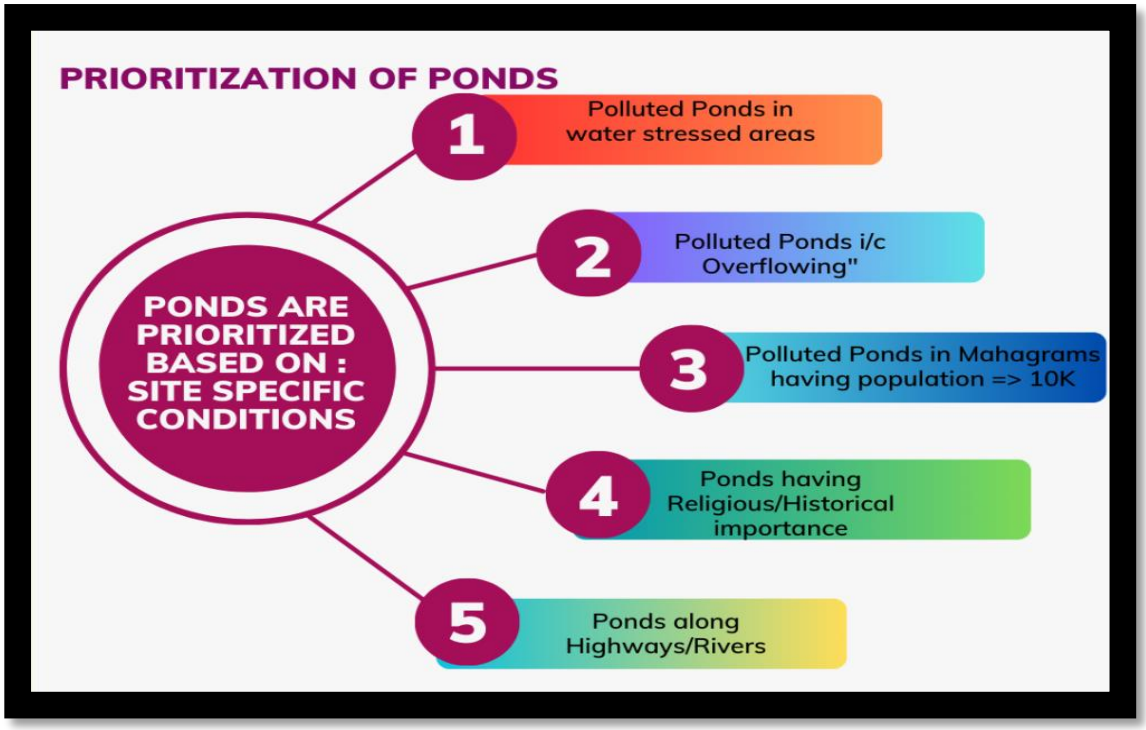


Figure 4: Prioritization of Ponds

The Polluted Ponds in water stressed areas receive the top most **priority** followed by ponds along highways/rivers, Mahagrams, clean and dry ponds.

3. Annual Action Plan

Keeping in view the above prioritization, "Annual Action Plans"(AAP) have been prepared.

While finalizing the Annual Action Plans for restoration/rejuvenation of polluted ponds, a minimum of 50% fulfilment of the respective districts/assembly constituency have also been considered.

4. Ponds Restoration Planning via Digital Survey and Working Drawings-

The HPWWMA has taken a lead in executing the Restoration works through PRPW and IWRD at the site as per the digital drawings issued by the Authority for the implementation by executing agencies with precision accuracy in estimation, prevention of encroachment and effective management of ponds.

1. **Digital Survey:**

- **Mapping and Data Collection:** The first step is conducting a detailed digital survey of the ponds to create accurate maps. This involves the use of Geographic Information System **(GIS)** and **remote sensing** technologies .There after Comprehensive data about the pond, including its dimensions, water quality, surrounding land use, and existing biodiversity, is collected.

2. Assessment: Condition Analysis and Stakeholder Consultation: The current condition of the pond is assessed to understand issues such as siltation, pollution, encroachments, and loss of biodiversity. Then by Involving local communities, stakeholders, and experts various insights and suggestions are gathered.

3. **Preparation of Working Drawings and its implementation**:

Based on the survey and assessment, detailed working drawings are prepared with technical specifications which are followed during the restoration of the ponds. These include plans for **dredging**, **desilting**, **constructing embankments**, and setting up the waste treatment facilities.

The restoration work is carried out as per the working drawings. This may involve civil works, **planting native vegetation**, and installing **aeration systems.** There after Continuous monitoring is done during and after the restoration of pond to ensure that the pond is restored to its natural state and in case of any issues is found pertaining to the same it is addressed promptly.

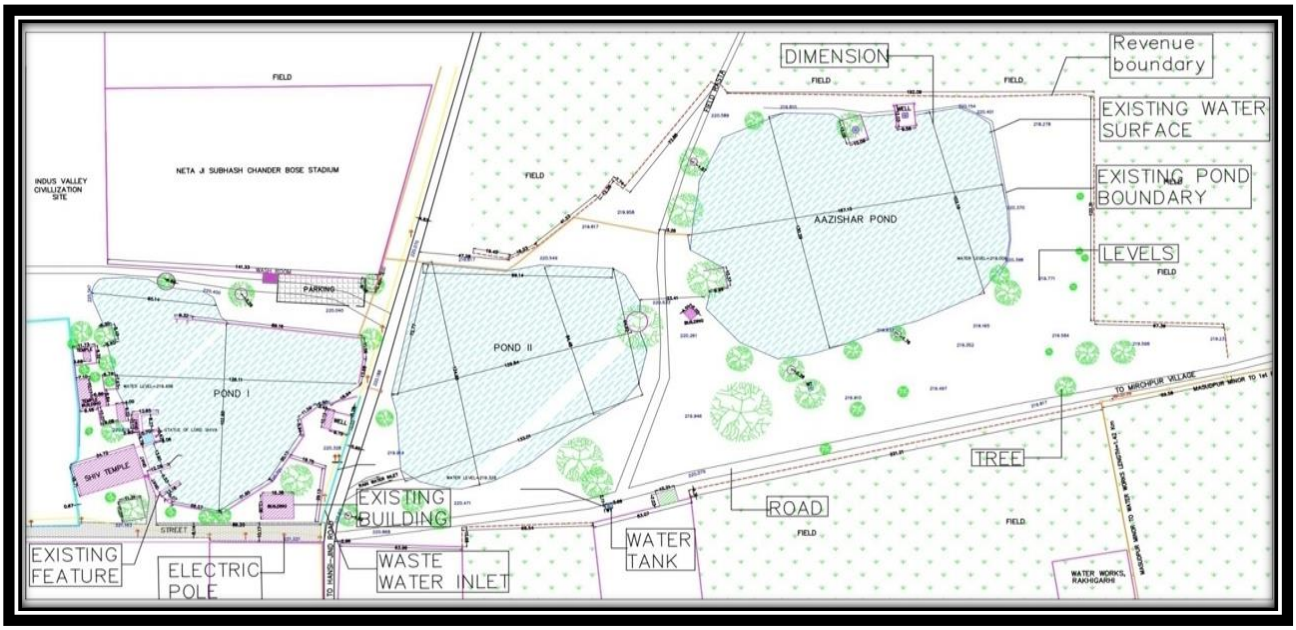


Figure 5: Digital Survey

Figure 6: Working Drawing

4. **Sustainable Management:** Once the restoration work is completed detailed maintenance plans are developed to ensure the long-term sustainability of the restored ponds. Local communities are also involved in the upkeep and protection of the ponds.

The HPWWMA's approach integrates modern technology with traditional knowledge, ensuring a comprehensive and sustainable restoration process.

5. Waste Water Treatment :

The Haryana Pond and Waste Water Management Authority (HPWWMA) have been actively working on managing and treating grey water entering and polluting the ponds in the state. **Grey water refers** to wastewater generated in households and buildings. Unlike sewage (black water) containing fecal matter, grey water has a lower level of contamination and can be safely treated and reused for various purposes.

If the grey water is not treated properly, as it can contain contaminants like soap, grease, and chemicals, it can harm soil health and contaminate groundwater. Also Pathogens and bacteria in grey water can pose health risks if it comes into contact with food crops or drinking water supplies. The chemicals in grey water can alter the salinity and pH of soil, affecting its fertility and structure over time.

Wide ranges of technologies are being employed for treatment of grey water and Black Water. Recognizing the importance of sustainability and environmental responsibility, the Pond Authority has prioritized **Nature Based Constructed Wetland (CWL) technology** for treating the Grey water flowing into its polluted ponds. HPWWMA has constituted **Technical Committee** with **Prof C.R.Babu, a prominent grey water treatment expert** as one of its **member** along with a team of scientists for the Grey Water Treatment .During various Inspections the In-house team of **HPA** collects the samples of the Waste water at Inlet/outlet of Constructed Wet land to evaluate the Treatment Efficiency and Monitor Water Quality .After the collection of the data it is analyzed at the **mini lab** which has been established in the office of HPWWMA.

As part of its Pilot Project proposed by **Prof. C.R. Babu (Pro- Ex Vice Chancellor, Delhi University)**, HPWWMA has successfully implemented CWL Technology to treat Industrial effluents flowing through Tributary Drain No. 4 (of **Kasanda and Kasandi** Village) in Sonipat district. This treated water fills up the two nearby restored ponds and put to resuse. This project demonstrates the effectiveness of CWL Technology in real-world applications, contributing to cleaner water bodies and a healthier Environment.

Figure 7: Before and After Image of Restored Pond of Kasanda -Kasandi

6. Monitoring Mechanism

The Haryana Pond and Waste Water Management Authority (HPWWMA) utilize a multi-layered monitoring mechanism to oversee pond health and ensure its functions are carried out effectively. Here's the structure:

6.1 District Consultation and Monitoring Committees (DCMCs):

DCMCs are established under the founding Act (2018) at the district level. It is composed of various stakeholders like government officials, representatives from local bodies (municipalities, panchayats), agriculture and environment departments, and experts.

Responsibilities of DCMCs:

- Monitoring the condition of ponds within the district.
- Reviewing plans and proposals submitted by the HPWWMA for pond development or restoration.
- Overseeing the implementation of projects related to ponds and wastewater management.
- Addressing public grievances related to ponds.

6.2. HPWWMA's Internal Monitoring: The HPWWMA has its own internal monitoring mechanisms to track progress through **WMIS** (**Water Management Information System**) of each project and ensure they meet environmental and functional goals.

This involves:-

- Monitoring, Planning Execution and Financial Progress of all ongoing Projects.
- Technical teams assessing water quality, ecological health, and infrastructure development related to ponds.
- Data collection and analysis for informing future strategies and ensuring project effectiveness.

6.3 Future Potential for Technology: The HPWWMA is planning to utilize the below technological tools for monitoring, such as:

i) Satellite imagery to track changes in pond water levels and surrounding vegetation. Utilization of free satellite imagery from various sources and the tools provided by **HARSAC** which offers adequate temporal and spatial resolution for monitoring ponds and vegetations. Images will be acquired on Monthly or Bi-Monthly basis to track the changes accurately. Then Preprocessing of the images will be done via **Cloud Masking** to remove clouds and cloud shadows to ensure clear imagery and at last images are align to a consistent geographic coordinate system for accurate comparison.

Figure: 8 Satellite imagery

Water Level Detection and Changes in the Water level: Normalized Difference Water Index (NDWI) will be used to detect water bodies and a threshold value to classify water and non-water areas. Also a time series of water extent would be made to observe changes over the time.

On the above lines Vegetation Monitoring will be done.

Analysis and Integration with Field Data –Various maps showing the spatial extent of water bodies and vegetation at various time points will be integrated with Field data. Further Statistical accuracy assessments will be done to ensure the reliability of the satellite-derived data.

Reports and Policy Development - Visual reports and dashboards will be made by using tools like Google Earth Engine, QGIS, or ArcGIS to communicate findings to stakeholders. Eventually analysis is to be done to make water management policies and intervention strategies.

By implementing this workflow, the Haryana Pond and Waste Water Management Authority will effectively monitor and manage pond water levels and surrounding vegetation, aiding in better water resource management and environmental conservation

ii) Sensor networks will be used to track changes in pond water levels as a part of the water management and conservation efforts.

Water Level Sensors measures the water level in the pond. Initially Site Survey will be done to determine the best locations for installing the sensors and communication modules.
They can be ultrasonic, pressure-based, or radar-based, depending on the accuracy and range required. Then **Data logger devices** will collect the data from the sensors at regular intervals and store it for transmission and via **Communication Modules** which transmits the collected data to a central server or cloud platform. This data will be aggregated, processed, and analyzed at **Central Monitoring system** which provide real-time monitoring and generate alerts for significant changes in water levels. Also it will help in managing pond ecosystems more effectively, protecting aquatic life.

By implementing such a sensor network, the HPWWMA will effectively monitor and manage pond water levels, contributing to better water resource management and environmental conservation in Haryana.

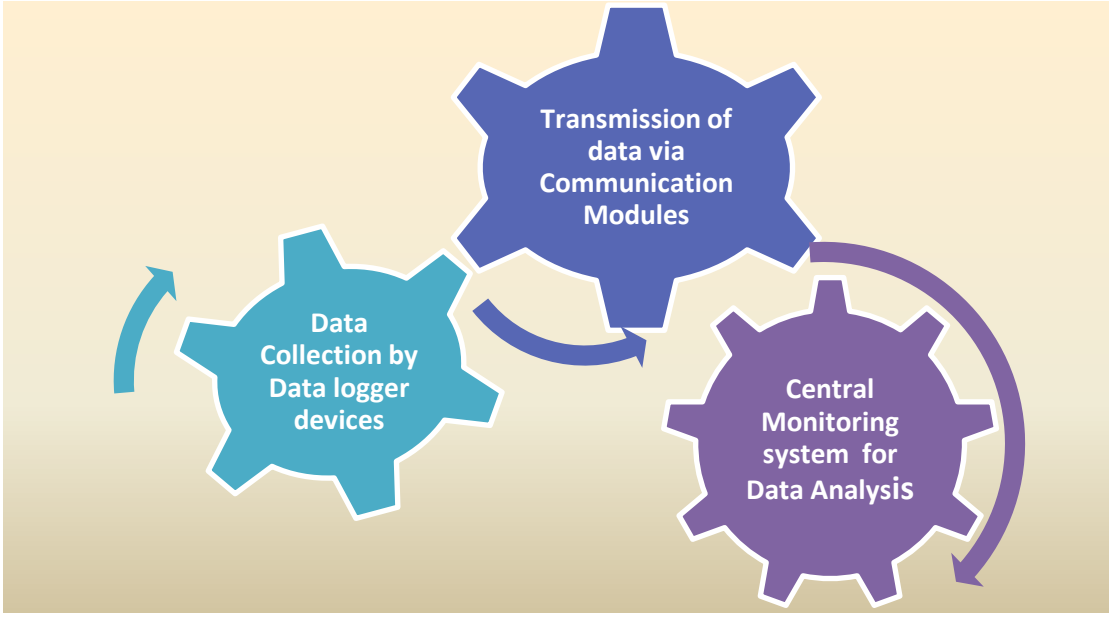


Figure 9: Sensor Network

7. Capacity Building

The HPWWMA prioritizes capacity building in several domains to achieve its objectives in pond and wastewater management. These areas can be categorized as:

- **Institutional Strengthening:**
  - Developing clear and efficient work practices across the organization, covering activities like pond assessment, project execution, and maintenance.
  - Investing in necessary equipment for water quality testing, pond surveying, and data management to improve monitoring and management capabilities.

- **Waste Water Management:** The authority worked on implementing waste water treatment plants and promoting the reuse of treated waste water for agricultural and non-potable purposes. This included the construction of decentralized waste water treatment systems in rural areas.
- **Research and Development:** The authority invested in research to find innovative solutions for water conservation and waste water treatment. This included studying traditional water management practices and integrating modern technology.

8. Inter-departmental Coordination

List of Activities on which Departments coordinate:-

S.No.	Activities	Department
1.	Restoration of Ponds	• Panchyati Raj (PR-PW) • Irrigation and Water Resources Department- Construction Unit (IWRD-CU) • Urban Local Bodies Department (ULBD) • Public Works Department (PWD-BR)
2.	Inlet – Outlet	• Irrigation and Water Resources Department (IWRD) • Micro Irrigation (MI) • Command Area Development Authority (CADA)

9. Detailed Statement Containing Information of Personnel in the Authority

The Authority has recruited the following Officers/ Officials on a contract/deputation against 61 different posts sanctioned by the state Government and the details have been shown in the Table-1 as below.

Table -1 DETAILED STATEMENT CONTAINING INFORMATION OF PERSONAL IN THE AUTHORITY

The authority had recruited the following officers /officers on a contract/deputation/additional charge basis against 61 different posts sanctioned by the state government.

S.no	Designation	2019-2020	2020-2021
1	Administrator cum Financial Advisor	0	0
2	Executive Engineer (Civil)	0 1	0 1
3	Architect	0 1	0 1
4	System Analyst		
5	Law Officer/Legal Consultant		0 1
6	Sub Divisional Engineer/Assistant Engineer (Civil)	0 2	0 2
7	Assistant Architect		0 1
8	Scientist (Environment) C level		
9	Account Officer	0	0 1
10	Office Superintendent	0 1	0 1
11	Private Secretary		
12	Accountant	0 2	0 2
13	Personal assistant (PA)		
14	Assistants	0 1	0 2
15	Junior Engineer (Civil)	0 2	0 2
16	Circle Head Draftsman (Arch/Civil)	0 1	
17	Head Draftsman		
18	Assistant Draftsman(Civil)	0 2	0 1
19	Assistant Draftsman(Arch)		
20	Junior Programmer	0 2	0 2
21	Assistant Legal		
22	Drivers		
23	Clerk cum DEO	0 6	0 5
24	Steno Typist		0 1
25	Coordinator/PRO		
26	Clerk/Caretaker(Diary/Dispatcher)	0 2	0 3
27	Peon -Sweeper Cum Chowkidar	10	0 9
	Total:	**33**	**35**

10. Annual Accounts of the Authority

The annual accounts for the year 2019-20 and 2020-21 has been finalized in consultation with M/s Pankaj Manvi & Associates, Charted Accountant and they have requested the Government to request the Principal Accountant General (Audit), Haryana for certification of accounts of Authority.

Financial Year	Total Expenditure (In lakhs)
2019-20	150.99
2020-21	309.01

11. Right to Information

The information relating to RTI Act, 2005 is as under:-

No. of applications received by SPIO seeking information under RTI Act	10

No. of applications for which information has been provided by SPIO	10
No. of applications pending with SPIO	NIL
No. of appeals filed before the first appellate authority against the order of SPIO	NIL
No. of appeals which have been disposed of by the first Authority	NIL
No. of appeals pending with the first appellate authority	NIL
No. of appeals not disposed of in the stipulated time frame	NIL