

FINAL REPORT ON GAP ANALYSIS/NEED ANALYSIS

Consultancy Services for analysis of
the legal bases & rules and regulation
at National and State, Output-1

November 2019

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1 Introduction

The purpose of this Draft Report on Gap Analysis/Need Analysis for the Consultancy Services for analysis of the legal bases & rules and regulation at National and State, Output-1, is to set out the baseline assessment and the Gap Analysis in the existing regulatory framework with respect to the national and international benchmarking and various stakeholder consultations held.

The proposed project emphasizes on the need for adaptation of the legal basis and rules and regulations to combat industrial wastewater pollution and subsequently aims at strengthening of Legal Framework for the same. The outcome of the proposed project is envisaged as the successful improvement and strengthening of the existing legal framework for industrial wastewater management system at National and State level (Uttarakhand and Bihar). The proposed project will identify key intervention areas along the regulatory framework for across the industrial wastewater value chain to enhance efficiency of the current disposal system and mitigate pollution. This objective is addressed in the report on Gap Analysis.

In India about 13468 MLD of wastewater is generated by industries and only 60% is currently being treated. The existing legal framework attempts to provide support to the industries through various policies and combat pollution through various guidelines and regulatory measures. Currently, at the national level the two major nodal agencies that look after the wastewater management in industries include:

- ▶ The Ministry of Environment, Forest and Climate Change (MoEFCC)
- ▶ Central Pollution Control Board (CPCB)

The major regulatory framework around the management of wastewater include:

- ▶ National Environment Policy
- ▶ National Water Policy
- ▶ Environment Protection Act
- ▶ Water Act
- ▶ CPCB/SPCB Guidelines

Through this project, EY has looked closely into all the existing policies, standards, guidelines and regulatory framework across the industrial wastewater management, study the best practices (international), identify gaps in the efficient management of industrial wastewater and provide recommendations for strengthening the legal framework to combat pollution.

2 Project Overview

2.1 Need for project

Industrial growth and need for environmental protection in India

Government of India has been focusing on the Industrial growth by continuously taking steps to facilitate industrial development in the country. In the past year 2017-18, with GVA (Gross Value Added) of Rs. 50.43 lakh crore the industrial sector contributed 29%.¹ Currently, there are nearly 3,000 designated industrial zones in India.

Along with the high focus in development of the industrial sector a balance is required in the extraction of resources, pollution control and waste and wastewater management. Rapid industrialization and urbanization coupled with the potential scarcity of water sources in the not-so-distant future, makes the efficient management of industrial wastewater the need of the hour.

To assess the impact of industrial development CPCB developed Comprehensive Environmental Pollution Index (CEPI) to find out an Index value to characterise quality of the environment. In 2009, 88 prominent industrial clusters were identified in consultation with the Ministry of Environment and Forest and Climate Change (MoEF&CC) for CEPI analysis. Out of identified 88 prominent industrial clusters, 43 industrial clusters in 17 States having CEPI score of 70 and above were identified as Critically Polluted Areas (CPAs). Further, 32 industrial clusters with CEPI scores between 60 & below 70 are categorized as Severely Polluted Areas (SPAs).²

In this context it is of utmost importance to achieve the industrial growth while protecting the environment. While there have been various initiatives taken up by the private sector such as adoption of modern technology and resource efficient practices there still requires an effective legal support and mandate from the government to ensure sustainable growth.

Sustainable & Environment-Friendly Industrial Production: Phase I

Under the Indo German Development Cooperation, a project on "Sustainable and Environment-friendly Industrial Production" (SEIP) was taken up as a joint project of GIZ and the Ministry of Environment, Forest and Climate Change (MoEF&CC) during March 2015 to February 2019 to find solutions to industrial wastewater and water problems. Majorly 3 states were taken up including Uttarakhand, Gujarat and Delhi to showcase sustainable technical solutions and

¹ Pib.nic.in. (2019). Contribution of various sectors to GDP. [online] Available at: <http://pib.nic.in/newsite/PrintRelease.aspx?relid=186413> [Accessed 1 May 2019].

² Cpcb.nic.in. (2019). Central Pollution Control Board | Ministry of Environment, Forest and Climate Change, Government of India. [online] Available at: <http://cpcb.nic.in/comprehensive-environmental-pollution-index-cepi/> [Accessed 2 May 2019].

business/ management models on a pilot basis for subsequent upscaling and replication.³ The project targeted to enable private sector actors to jointly implement strategies to achieve an environment friendly industrial development. With the outputs grouped in to 3 areas:

- ▶ Output A: Environment-oriented modernization of 3 industrial areas (showcasing solutions),
- ▶ Output B: Establishing appropriate framework conditions at national and state levels
- ▶ Output C: Knowledge management and dissemination.

Sustainable & Environment-Friendly Industrial Production: Phase II

The success of the initial phase provided a strong foundation and emphasized the need for improved mechanism at national and state level for **abatement of industrial wastewater pollution** in the context of urban areas as well as the pollution of rivers and other water resources. The second phase aims at promotion of sustainable industrial development in the urban sphere by reducing industrial wastewater pollution through strengthening of strategic and operational governance structures including framework conditions for regulating, implementing and monitoring. The project follows a very structured approach with involvement of all the major stakeholders involved including the people who formulate, implement and on whom it implies to. The project aims to deliver the following outputs:

- ▶ Output 1: Strengthening of Legal Framework
- ▶ Output 2: Strengthening of Organisational Procedures and Processes
- ▶ Output 3: Strengthening of Incentive Mechanisms
- ▶ Output 4: Strengthening of Knowledge Products

In this regard, GIZ has mandated EY to provide consultancy services for Output 1: Strengthening of Legal Framework based on the contract no. 83329060, dated July 11, 2019.

2.1 Objective of this study

The prime objective of this assignment is as follows:

To strengthen the regulatory framework at national and state level for abatement of industrial wastewater pollution.

The output of this study shall be used to inform GIZ, on the key areas of intervention to be looked into for strengthening the legal framework and suggesting recommendations to mitigate the gaps in effective implementation of legal framework.

³ Green Growth Knowledge Platform. (n.d.). Sustainable Environment-friendly Industrial Production (SEIP). [online] Available at: <http://www.greengrowthknowledge.org/project/sustainable-environment-friendly-industrial-production-seip> [Accessed 2 May 2019].

3 Mapping of Stakeholders

EY has undertaken identification and mapping of stakeholders concerned with the industrial wastewater management in India, through the following steps:

- ▶ Study the overarching institutional structure providing support in formulation, monitoring and implementation of industrial wastewater policies/guidelines/rules etc.
- ▶ Identify the key stakeholders at each node of the industrial wastewater value chain. The key stakeholders across the entire value chain of industrial wastewater management is given below:

Table 1: Key Stakeholders across industrial wastewater management value chain

Node of Value Chain	Stakeholders
Supply of raw water to industry	CPCB, SPCBs, Central Groundwater Authority, State Industrial Development Corporations (SIDC), MOEF, Ministry of Jal Shakti.
Water utilisation by Industry	SPCB, SIDC, Industrial Commissionerate; Industrial Workers / personnel, Labour Department, Irrigation Department, Public Health Department
Generation of Wastewater	SPCB, Local community, Dept. of Forest/Environment; Industrial Commissionerate, Industries
CETP/ETP Processing of wastewater OR of	SPCB, SIDC, Industrial Commissioner ate; Industrial Workers / personnel; Safety Issues; research institutes
Discharge of wastewater/Re-use of waste water	CPCB, SPCBs, MoEFCC; Central Groundwater Authority; State Industrial Development Corporations (SIDC); Ministry of Jal Shakti; Agriculture Department, etc.

- ▶ Identify roles and responsibility of each stakeholder
- ▶ Map relationship between stakeholders (type of interaction, type of reporting, contracts, etc.)

The assessment was carried out through the following steps:

- ▶ EY carried out a secondary research in order to identify various stakeholders and their roles and responsibilities
- ▶ EY has conducted meetings with GIZ, MOEF, CPCB, BIADA, Bihar State Pollution Control Board, SIDA, SIDCUL, Uttarakhand Environment Protection & Pollution Control Board, Industries, etc. to further understand the current institutional set up in detail, and the key stakeholders involved.
- ▶ EY has also used its observations to map the relationship between stakeholders to further identify any gaps thereof.

4 Dimensions proposed to be studied in the Industrial Wastewater value chain

EY has undertaken a detailed study on the dimensions to be studied in the industrial waste water value chain to identify the potential areas of intervention for strengthening the regulatory framework. We have prepared a holistic list of dimensions across the following value chain:

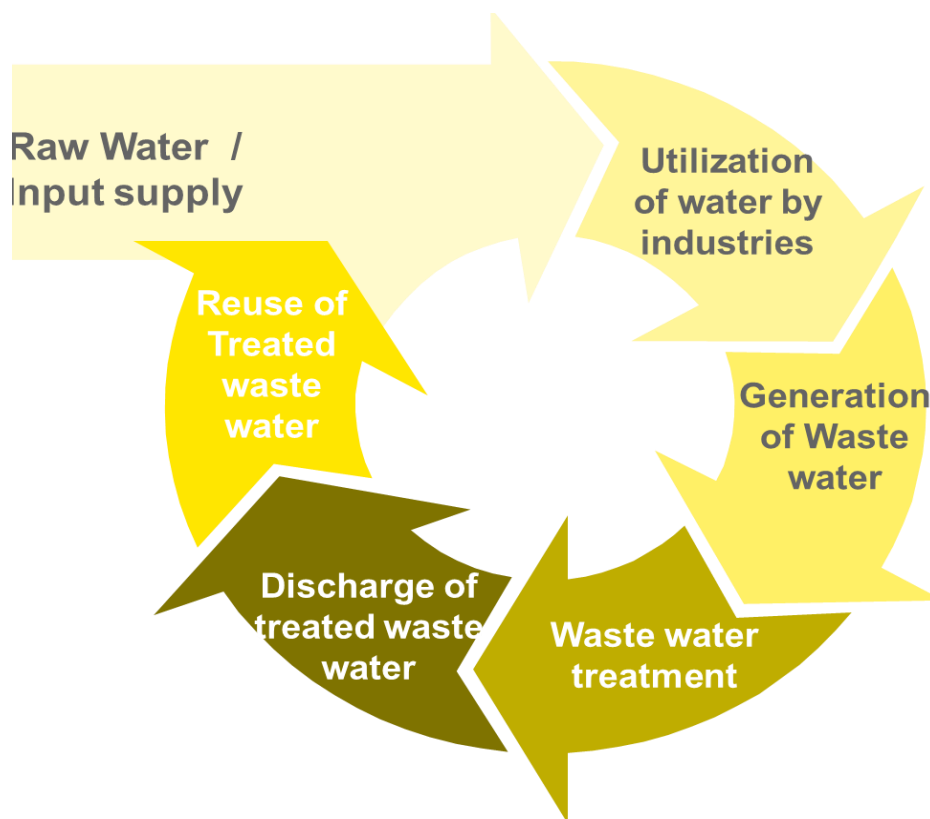


Figure 2: Overall Methodology to assess the legal and regulatory framework

At each node of the value chain, we have identified the following dimensions that shall be looked into while undertaking the baseline assessment.

Table 2: Dimensions Proposed to be Studied/Studied within each node of industrial wastewater value chain

Steps in Industrial Process Flow	Dimensions Proposed to be Studied/Studied within each Step
Raw Water Supply Input to Industry	<ul style="list-style-type: none"> • Withdrawal from different sources • Water consumption per unit for various industrial sectors • Pre-treatment • Quality of water

	<ul style="list-style-type: none"> • Treatment, supply and distribution system - Infrastructure provisioning and management by IDC/individual industries • Manpower/skills required for managing the infrastructure
Utilisation of Water by Industry	<ul style="list-style-type: none"> • Water consumption • Quality of water • Specific technologies (BAT, BCT, BPT) prescribed to combat pollution of water for each industrial sector • Monitoring • Safety norms and process controls
Generation of Wastewater post-industrial process	<ul style="list-style-type: none"> • Specific technologies prescribed for treatment of wastewater • water, backwash water, domestic use, cooling towers, etc. • Quality and Quantity of wastewater generated
Effluent Treatment (CETP/ETP)	<ul style="list-style-type: none"> • Pre-treatment of wastewater before discharge into CETP/ETP • Common inlet standards for CETP • Technology to be adopted by the CETP/ETP • Quality standards and discharge norm • Provisioning of infrastructure for treatment and transport of wastewater • Ownership and management • Manpower/skills
Discharge of Wastewater/Reuse of Wastewater	<ul style="list-style-type: none"> • Mandates on re-use of treated water • Quality and quantity of treated water • Types of reuse and treatment technologies • Infrastructure provisioning and management

5 Methodology used for Assessment of Legal & Regulatory Framework

This section delineates the methodology used by EY to analyze the as-is legal and regulatory framework governing the industrial process flow, including the usage of water by the industrial units and thereafter discharge of waste water by such industries.

The overall methodology adapted to assess the legal and regulatory framework shall be as follows:

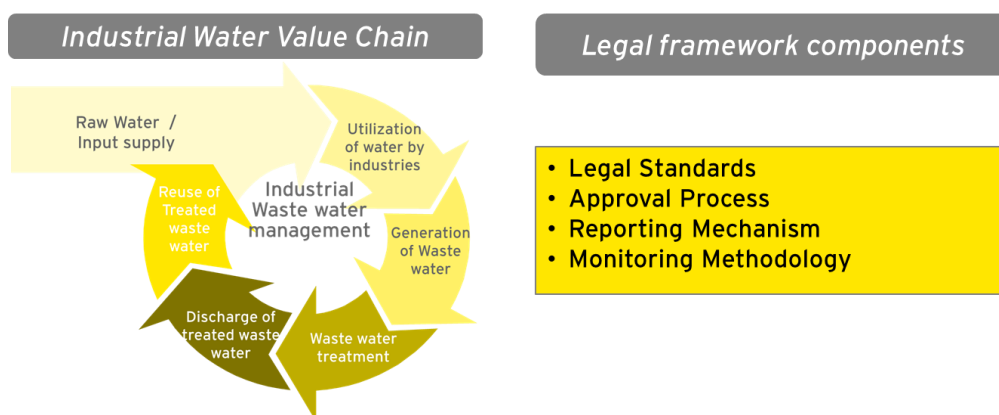
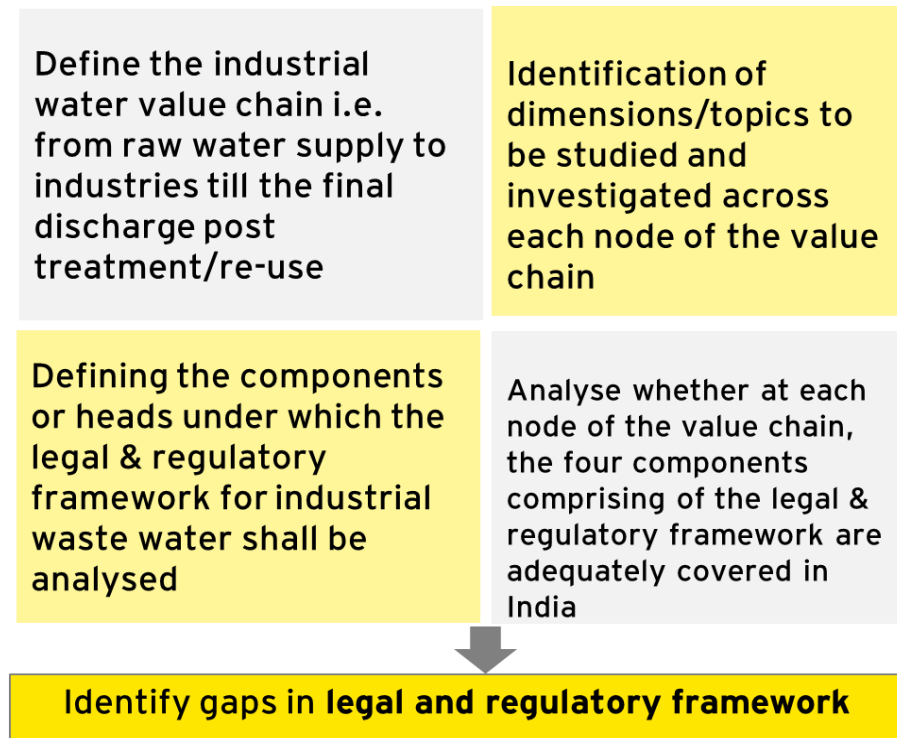


Figure 2: Overall Methodology to assess the legal and regulatory framework

The detailed methodology is depicted through the following steps that were followed by the team:

Step 1: Defining the Industrial Process Flow: The usage of water in the industrial process has been broken down into five separate components or stages:

- ▶ Raw Water Supply to the Industry
- ▶ Usage of water by the Industry
- ▶ Generation of wastewater post the industrial process
- ▶ Treatment of Effluent by way of CETP or individual ETPs
- ▶ Discharge of wastewater post treatment and re-use of water

Step 2: Laying down the dimensions/sub-components of each stage of industrial process flow: Sub-components or dimensions within each stage was devised and incorporated. For instance, when it came to raw water supply to the industry, the following sub-components have been taken into account: a) Source i.e. what are the various sources of raw water and what is the regulatory framework governing them; b) Quality i.e. are there any legal and regulatory aspects governing the quality of raw water; and c) Quantity i.e. are there any laws and regulations governing the quantity of raw water to be used by an industrial unit.

Step 3: Defining Legal and Regulatory Framework: For the purpose of analysis we have defined legal and regulatory framework to mean four salient components:

- ▶ Standards
- ▶ Approval mechanism
- ▶ Laws governing operation/self-reporting mechanism (if any)
- ▶ Monitoring mechanism

Step 4: Case Studies and Benchmarking: Against the backdrop of the above three steps, we have analyzed the legal and regulatory framework as it exists at the national level in India as well as in the state of Bihar. In terms of identifying certain global best practices, we have gone about analyzing certain international case studies such as Canada, United States of America, Spain.

Keeping the above framework and methodology in mind, the detailed baseline assessment is depicted in the sections below.

6 List of Laws reviewed

In this section, we have listed the holistic list of laws/rules/directives/standards that we have studied at the national and international level for the purpose of conducting the baseline assessment. The table given below depicts the list.

Table 3: List of Laws

National	International
<ul style="list-style-type: none"> ➤ Environment Protection Act, 1986 ➤ Environment Protection Rules (including Schedules I, II and VI) ➤ Water (Prevention and Control of Pollution) Act, 1974 ➤ Water (Prevention and Control of Pollution) Rules, 1975 ➤ Water Cess Act, 1977 ➤ Water Cess Rules, 1978 ➤ National Green Tribunal Act, 2010 ➤ Judgments and orders of NGT ➤ Public Liability Insurance Act, 1991 and notifications thereunder ➤ BIADA Act, 1974 ➤ BIADA Rules, 1975 ➤ Environmental Impact Assessment Notification, 2006 (as amended from time to time) ➤ Notifications issued by the Bihar State Pollution Control Board ➤ Notifications issued by the Central Groundwater Authority ➤ Bihar Industrial Investment Promotion Act, 2016 ➤ Bihar Industrial Investment Promotion Rules, 2016 	<ul style="list-style-type: none"> ➤ Clean Water Act of USA ➤ Notifications and standards issued by the Environment Protection Agency of USA ➤ EU Directives on discharge of water ➤ Water Sustainability Act, 2014 of Canada (specifically the province of British Columbia) ➤ Royal Decree 1620/2007- law on reuse of waste water in Spain ➤ Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Germany ➤ Effluent Guidelines by the Environment Protection Agency of USA

7 Detailed Assessment of As-is Regulatory Framework- Bihar and Uttarakhand

Based on the methodology adopted as depicted in section 5 above, we have formulated a matrix which aided in providing clear identification of areas that have not been addressed by the existing framework and help understand the priority areas to be addressed for strengthening of legal framework.

The findings of the detailed baseline assessment is as follows:

a) SUPPLY OF RAW WATER TO INDUSTRY

I. NATIONAL LEVEL

Sub components/Dimensions Studied: a) Source of raw water; b) Quantity of raw water; c) Quality of raw water

Legal and Regulatory Framework: a) Standards; b) Approval Mechanism; c) Self Reporting Mechanism; d) Monitoring Mechanism.

i) **Source of Raw Water**

In terms of **baseline standards**, when it comes to source of raw water, the Central Groundwater Authority (CGWA) acts as the nodal agency regulating usage of and supply of ground water to industries. There is no single nodal agency for the usage of surface water and state government departments in respective states govern the supply and extraction of surface water.

In terms of **approval mechanism**, when it comes to source of raw water for industries, the source of water has to be identified and revealed by each industry at the Environmental Impact Assessment (EIA) conducted by the Ministry of Environment and Forests (MoEF). Further, during the process of granting the Consent to Establish (CTE) and Consent to Operate (CTO), the State Pollution Control Board (SPCB) also requires the industrial unit to reveal the source of water proposed to be used in the industrial process without which the CTE and CTO is not granted.

When it comes to discussing source of raw water for industries and any **self-reporting mechanism** being in place, as mentioned above, in the initial stages when the EIA is conducted by MoEF and grant of CTE and CTO by the respective SPCBs is performed, the industries are required to self-report. However, thereafter, there is no continuous self-reporting obligation on the industries to reveal the source of raw water being utilized.

In terms of **monitoring mechanism** being in place for checking the source of raw water being used by the industries, SPCB and MoEF does *Suo motu* monitor whether the industrial unit is using the same source of water which it declared at the time of EIA and at the time of grant of CTE and CTO.

ii) **Quantity of Raw Water to be used**

In terms of laying down of **baseline standards** for quantity of raw water which may be used by an industry, the CGWA regulates the amount of groundwater which may be extracted and lays down quantity of groundwater which may be extracted from water sensitive areas. For surface water, there is no single nodal authority which regulates the quantity of water which may be used by industries and the state government of each respective state has different framework and standards.

In terms of **specific approvals and the procedure** to be followed, approval/NOC has to be taken in certain cases from CGWA (especially when ground water is sought to be extracted from water sensitive areas) before using such groundwater. For surface water, the state irrigation or water resources department's permission has to be taken before utilization. Further, it may be noted that the EIA process conducted and CTE and CTO also mandates revealing quantity of water to be used by an industry.

In terms of existence of **self-reporting mechanism**, currently there is no obligation on the industries to self-report periodically the amount of raw water which is being used by the industrial unit and whether they are complying with the quantity specified during the EIA and CTE/CTO process.

When it comes to **monitoring mechanism** quantity of raw water being used, the SPCB does *Suo motu* monitor the amount of raw water being used by the industry. Further, in case of groundwater usage, CGWA does install water meters to the industrial units to ascertain how much groundwater is being utilized by the industry from time to time.

iii) **Quality of Raw Water to be used**

Currently, there is no law or regulation which governs the quality of the raw water being supplied/being utilized by the industry when it comes to laying down of **minimum standards** to be followed. Since, there are no minimum standards, there is no question of existence of a **self-reporting mechanism** or even a **monitoring mechanism** when it comes to monitoring the quality of raw water being used by the industrial unit. There are also no **specific approvals** which have to be obtained when it comes to quality of raw water to be supplied to an industrial unit.

Industrial Process	Dimensions	Standards	Approval/Procedure	Self Reporting Structure	Monitoring
Raw Water Supply Input to Industry in India	Quality	There are no standards for quality of raw water to be used by the industrial unit	No specific approval process vis-à-vis quality of raw water	Since there are no standards, there is no reporting mechanism.	Since there are no standards, there is no monitoring of quality.
	Quantity	Quantity of raw water is regulated by the Central Groundwater Authority for groundwater as per the Guidelines/Criteria for evaluation of proposals/requests for ground water abstraction issued by CGWA. State wise regulation for surface water usage.	Approval/NOC has to be taken in certain causes from CGWA and the relevant state industrial authority before using groundwater. State department approval for surface water. EIA process and CTE/CTO also mandates revealing qty of water to be used.	No self reporting structure.	Monitoring of quantity of water being used is done by the SPCBs and by way of installation of meters by CGWA. NGT has directed that CPCB formulate compensation formula for illegal extraction of groundwater.
	Source	CGWA is the nodal authority which notifies sensitive areas from where groundwater extraction is restricted.	Source of water has to be revealed in the EIA checklist and in the CTE/CTO process of SPCB	Source of water has to be revealed in the EIA checklist and in the CTE/CTO process of SPCB. However, no self reporting thereafter	SPCB and MoEF monitors whether the source mentioned in the EIA and CTE/CTO is being adhered to.
CASE STUDY - Canada (Province of British Columbia)					
Raw Water Supply Input to Industry	Water Sustainability Act, 2014	Yes, standards are laid down regarding the quantity of water which may be used by the industrial unit	Yes, there is a stringent approval process in place, in the statute, including taking up an user license for a period of 24 months	No self reporting mechanism.	There is a monitoring mechanism whereby the Controller, under the Act, does check on utilisation of raw water.

Figure 3: Matrix showing the as-is legal and regulatory framework at national level for raw water supply to industries

II. **STATE LEVEL: BIHAR**

Post consultation with the officials of Bihar Industrial Area Development Authority (BIADA) and the State Pollution Control Board (SPCB) of Bihar, the following points emerge when it comes to the as-is legal and regulatory framework:

- **Standards:** In Bihar the primary source of raw water for any industrial unit is groundwater and when it comes to groundwater, CGWA sets the standards as to quantity of groundwater which may be extracted by the industries depending on the type of industry and whether the area is water sensitive. However, there are no baseline standards when it comes to regulating the quality of groundwater by CGWA or BIADA or the state government.
- **Approval Mechanism:** In Bihar, a NOC/permit has to be taken from CGWA before an industry can use groundwater and the same has been notified to all industries in Bihar by the state government. The raw water supply is provided by Department of Public Health and Engineering, Bihar. A separate approval has to be taken from the aforesaid department as well so that the industry gets the actual supply of groundwater.

- **Self-Reporting Mechanism:** Currently, there is no self-reporting mechanism in place in Bihar which obligates the industrial unit to self-report the quantity of raw water being extracted on a periodic basis.
- **Monitoring Mechanism:** In terms of monitoring, the Bihar SPCB in coordination with BIADA and CGWA does install water meters in the industrial units to check how much groundwater is being extracted. The readings from these water meters are taken periodically so as to ensure that there is no wastage or over utilization of groundwater.

Regulations Industrial Process Flow	Dimensions/Topics to be studied	Standards	Approval/Procedure	Self Reporting	Monitoring
Raw Water Supply Input to Industry	Quality	Bihar uses groundwater as source of raw water.	NOC/permit has to be taken from CGWA before an industry can use groundwater.	No separate self reporting mechanism.	CGWA prescribes installation of water meters for auditing the usage of groundwater. BIADA, SPCB and CGWA monitors the meter readings periodically.
	Quantity	CGWA sets the standards as to quantity of groundwater which may be drawn. But no specific standards for quality of groundwater.	The raw water supply is provided by Department of Public Health and Engineering, Bihar. Approval to be taken from department as well.		
	Source				

Figure 4: Matrix showing the as-is legal and regulatory framework in Bihar for raw water supply to industries

III. STATE LEVEL: UTTARAKHAND

This section delineates the findings from the stakeholder consultation with the officials of State Industrial Development Authority (SIDA), State Industrial Development Corporation of Uttarakhand (SIDCUL) and Uttarakhand Environment Protection & Pollution Control Board

- **Standards:** The primary source of raw water for most of the industrial units and industries is groundwater. The CGWA sets the standards as to quantity of groundwater which may be extracted by the industries depending on the type of industry and whether the area is water sensitive. However, there is no monitoring of the actual quantity of water supplied to the industries or the quality of water by the Pollution Control Board or SIDCUL.
- **Approval Mechanism:** In Uttarakhand, a NOC/permit has to be taken from CGWA before an industry can use groundwater and the same has been notified to all industries in Uttarakhand.
- **Self-Reporting Mechanism:** Currently, there is no self-reporting mechanism in place which obligates the industrial unit to self-report the quantity of raw water being extracted on a periodic basis.
- **Monitoring Mechanism:** In terms of monitoring, there is no concrete mechanism for the Uttarakhand Environment Protection & Pollution Control Board to monitor the utilization of groundwater.

IV. Case Study of Canada

The Canadian province of British Columbia has enacted a statute in 2014 called the Water Sustainability Act which has changed the legal regime under which water may be utilized. Earlier there were no caps on the quantity of groundwater which can be utilized by any entity or industry or individual. However, the new law prescribes, as per Section 10, taking up use approvals prior to diversion or usage of water from a stream or aquifer i.e. both surface water and ground water. As part of approval process, the quantity of water which may be used shall be fixed and the purpose of usage of water shall also be pre-determined. The approval shall be provided for a period of 24 months at a time and shall be subject to renewal after that. The applicants have to pay a prescribed fee and fill a particular form to the Government before actually utilizing water. Any violation of the use-approval shall lead to fines and penalties.

The statute also provides a robust monitoring mechanism wherein government authorities have the power to inspect and enter upon the industrial unit and check whether such industrial unit is complying with the license conditions.

b) UTILISATION OF WATER BY VARIOUS TYPES OF INDUSTRY

I. NATIONAL LEVEL ASSESSMENT

Sub components/Dimensions Studied: a) Amount of water consumption by industrial unit; b) Technology to be used during water usage; c) Process to be followed by the industrial unit during water use; and d) Safety norms in place at industrial unit

Legal and Regulatory Framework: a) Standards; b) Approval Mechanism; c) Self Reporting Mechanism; d) Monitoring Mechanism

i) Water Consumption by the Industrial Unit

In terms of **baseline standards**, CGWA does limit the amount of groundwater consumption by industries in water sensitive areas. State departments limit the amount of surface water usage. Also, Water Rules framed under the Water Act prescribe the amount of water to be used for unit of production for certain industries.

When it comes to water consumption by industrial units, there are certain specific **approvals** which have to be considered. For the actual supply of water and subsequent utilization, the approval of the state public works department or the state irrigation department has to be taken by the industrial unit.

Currently, there is no **self-reporting mechanism** in place obligating the industrial units to Suo motu report the amount of water being consumed to any authority.

In terms of **monitoring of water consumption**, the SPCBs monitors the amount of water being consumed by the industrial unit on a periodic basis. Further, along with the SPCB, the CGWA monitors the amount of groundwater being utilized by an industrial unit and whether it is consuming groundwater in excess of the limits prescribed by CGWA.

ii) Technology to be used by industrial units

Currently, in terms of **minimum standards**, there is no fixed technology standard prescribed under any law or regulation when it comes to utilization of water in the actual industrial process. There are also no **specific approvals** which have to be obtained by the industry for using a type of water-use technology in the industrial process.

Since, there are no minimum standards, there is also no **self-reporting mechanism** in place and there is also no **monitoring** by any regulatory authority checking which technology the industrial unit is using.

iii) Process to be followed by the industrial units

Currently, there are no baseline standards issued by any regulatory authority stipulating the specific industrial process that must be used by each industrial unit when it comes to utilization of water. There are also no specific approvals which have to be taken for using any single industrial process. Also, since there are no baseline standards, there is no question of there being in place any self-reporting mechanism or any monitoring mechanism to ascertain the industrial process being followed by an industrial unit.

iv) Safety norms during utilization of water by industries

In terms of safety within the industrial unit and the overall occupational safety of the personnel, the **baseline safety standards** are laid down under applicable labor laws such as Factories Act, 1948 and other sector specific laws such as Mines Act, 1952, Dock Workers (Safety, Health and Welfare) Act, 1986; Plantation Labor Act, 1951; Explosives Act, 1884; Indian Boilers Act, 1923.

In terms of **approval and NOCs**, the applicable labor laws require the relevant labor department authorities or the industrial department of the state to provide the requisite approvals before an industrial unit starts operating.

In terms of **monitoring**, there are regular checks by the relevant state, municipal and other authorities specified under applicable labor laws to check compliance of the industrial unit with the relevant safety standards.

Industrial Process Flow	Dimensions	Standards	Approval/Procedure	Self Structure	Reporting	Monitoring
Utilisation of Water by various types of industries in India	Technology	There is no fixation of technology which an industrial unit has to use.	No specific approval process for using a type f technology in the industrial process.	Since there are no standards, there is no self reporting mechanism for the technology used.		No monitoring of the technology being used
	Process	No specific standards as to what industrial process ought to be used	There is no requirement of prior approval required for deciding upon any industrial process.	No self reporting structure with respect to the industrial process that is being used		There is no monitoring mechanism for the process to be followed by industrial unit.
	Water Consumption	CGWA does limit the amount of groundwater consumption by industries in water sensitive areas. State departments limit the amount of surface water usage. Also, Water Rules prescribe the amount of water to be used for unit of production for certain industries.	For the purpose of water consumption by any industry, the state industrial department or public works department provides approval.	No self reporting of the water consumption		SPCB monitors the amount of water consumed along with the CGWA for groundwater.
CASE STUDY - US EPA						
Utilisation of Water by various types of industries	US EPA Effluent Guidelines	EPA identifies the best available technology that is economically achievable for a particular industry and sets regulatory requirements based on the performance of that technology. The regulations do require facilities to achieve the regulatory standards which were developed based on a particular model technology.	There is no requirement of prior approval required for deciding upon any industrial process.	No self reporting structure with respect to the industrial process that is being used		The US EPA maintains regular checks on the type of processes or technologies used.

Figure 5: Matrix showing the as-is legal and regulatory framework at national level for utilization of water by various types of industries

II. STATE LEVEL ASSESSMENT: BIHAR

Post consultation with the officials of Bihar Industrial Area Development Authority (BIADA) and the State Pollution Control Board (SPCB) of Bihar, the following points emerge when it comes to the as-is legal and regulatory framework:

- **Standards:** Industry specific norms have been provided with respect to quantum of consumption of water under Water Rules laid down under the Water Act. However, no baseline technological standards or industrial process standards have been laid down in the state of Bihar.
- **Approval Mechanism:** As part of the EIA approval process conducted by the MoEF as well as the CTE/CTO approval process conducted by the SPCB approval has to be taken from MoEF and SPCB for quantum of consumption of water. However, Bihar specifically does not have any separate approval for technology to be used in the industry or the industrial process to be followed. For safety issues, the approval of the applicable municipal, state and labor authorities is needed under the various central legislations mentioned above.
- **Self-Reporting Mechanism:** Currently, there is no self-reporting mechanism in place in Bihar which obligates the industrial unit to self-report the manner in which the water is being utilized in the industrial process or the technology being used by such industrial unit.
- **Monitoring Mechanism:** In terms of monitoring, the MoEF and the Bihar SPCB as part of the EIA/EC post monitoring mechanism and the CTE/CTO process, respectively, does check the amount of water that is being consumed by an industrial unit. However, there is nothing laid down in terms of monitoring of the industrial process and the technology to be followed by an industrial unit.

Regulations Industrial Process Flow	Dimensions/Topics to be studied	Standards	Approval and Procedure	Operations	Monitoring
Utilisation of Water by various types of industries	Technology	Industry specific norms have been provided with respect to quantum of consumption of water under Water Rules. However, no technological standards or process standards have been laid down in Bihar.	As part of EIA/EC, approval and the CTE/CTO approval of SPCB has to be taken for quantum of consumption of water. No separate approval for technology and process. For safety, the approval of the municipal, state and labour authorities is needed.	No separate self reporting over the quantum of water being used or the technology and process being used.	As part of the EIA/EC post monitoring mechanism and the CTE/CTO process of SPCB the consumption of water is checked . However, no monitoring of process & technology
	Safety				
	Process				
	Water Consumption				

Figure 6: Matrix showing the as-is legal and regulatory framework in Bihar for utilization of water by various types of industries

III. STATE LEVEL ASSESSMENT: UTTARAKHAND

- **Standards:** Industry specific norms have been provided with respect to quantum of consumption of water under Water Rules laid down under the Water Act. However, no baseline technological standards or industrial process standards have been laid down at the state level
- **Approval Mechanism:** As part of the EIA approval process conducted by the MoEF as well as the CTE/CTO approval process conducted by the SPCB approval has to be taken from MoEF and SPCB for quantum of consumption of water. However, Uttarakhand specifically does not have any separate approval for technology to be used in the industry or the industrial process to be followed.
- **Self-Reporting Mechanism:** Currently, there is no self-reporting mechanism in place in Uttarakhand which obligates the industrial unit to self-report the manner in which the water is being utilized in the industrial process or the technology being used by such industrial unit.
- **Monitoring Mechanism:** There is no concrete monitoring mechanism in place to monitor the quantity, quality of water used by different type of industries.

c) GENERATION OF WASTEWATER POST INDUSTRIAL PROCESS

I. NATIONAL LEVEL ASSESSMENT

Sub components/Dimensions Studied: a) Quantity of wastewater generated; b) Quality of wastewater generated; and c) Technology to be used during water usage.

Legal and Regulatory Framework: a) Standards; b) Approval Mechanism; c) Self Reporting Mechanism; d) Monitoring Mechanism

i) Quantity of Wastewater generated post completion of industrial process

In terms of **baseline standards**, under the Environment Protection Rules, 1987 framed under the Environmental Protection Act, 1986, there are discharge standards which have been specified in terms of quantity of wastewater which may be generated. The aforesaid rules specify the quantity of wastewater which ought to be discharged after treatment by an ETP or CETP. However, there are no specific baseline standards for quantity of wastewater immediately post completion of the industrial process.

In terms of the **approval mechanism** in place, prior to operationalization of the industry, the EIA process and the CTE/CTO process ensures that an approval has to be taken from MoEF and SPCB respectively in which the tentative quantity of wastewater to be generated has to be disclosed.

There is however, no **self-reporting mechanism** in place which obligates industries to *Suo motu* report the quantity of wastewater which is being generated immediately after the completion of the industrial process.

In respect of **monitoring mechanism**, there is a monitoring mechanism to check the final discharge standards by the SPCB on a periodic basis but there is no separate monitoring of the generated wastewater quality immediately after completion of industrial process.

ii) Quality of Wastewater generated post completion of industrial process

In terms of **minimum baseline standards**, there are discharge standards as per the Environment Protection Rules framed under the Environment Protection Act which have to be adhered to in respect of quality of water to be discharged into land surface areas or into water bodies. In case the water has to be sent to CETP, then inlet standards have to be adhered to. However, no specific baseline standards for quality of wastewater immediately post the completion of the industrial process have been prescribed.

In respect of **approvals and permissions**, prior to operationalization of the industry, the EIA process and the CTE/CTO process ensures that an approval has to be taken from MoEF and SPCB respectively in which the quality of wastewater to be generated has to be disclosed to both the aforementioned agencies.

As of date, there are no **self-reporting requirements** under any law obligating industries to periodically report to any authority the quality of waste water being generated immediately after completion of the industrial process.

In terms of **monitoring mechanism**, while there is a monitoring mechanism to check the compliance with the discharge standards framed under the Environment Protection Rules post treatment by ETP/CETP, there is no separate monitoring of the generated wastewater quality immediately after completion of industrial process.

iii) Technology to be used for generation of wastewater post-industrial process

As on date there are no specific baseline **standards** mandating the type of technology to be used for the purpose of minimizing the generation of wastewater or improving the quality of wastewater being generated post completion of industrial process. Since there are no specific standards in place, there is no self reporting mechanism or monitoring of the technology which is being used.

Industrial Process Flow	Dimensions	Standards	Approval/Procedure	Self Reporting Mechanism	Monitoring
Generation of Wastewater post industrial process in India	Quality	There are discharge standards as per the EP Rules which have to be adhered to in respect of quality of water. In case the water has to be sent to CETP, then inlet standards have to be adhered to. However, no specific standards for quality of wastewater immediately post industrial process.	Prior to operation of industry, the EIA process and the CTE/CTO process ensures that an approval has to be taken from MoEF and SPCB respectively in which the quality of wastewater to be generated is to be disclosed.	No self reporting mechanism.	There is a monitoring mechanism to check the final discharge standards but no separate monitoring of the generated wastewater quality immediately after completion of industrial process.
	Quantity	There are discharge standards as per the EP Rules which have to be adhered to in respect of quantity of water discharged. However, no specific standards for quantity of wastewater immediately post industrial process.	Prior to operation of industry, the EIA process and the CTE/CTO process ensures that an approval has to be taken from MoEF and SPCB respectively in which the quality of wastewater to be generated is to be disclosed.	No self reporting mechanism.	There is a monitoring mechanism to check the final discharge standards but no separate monitoring of the generated wastewater quality immediately after completion of industrial process.
	Technology	No specific technological standards.	No specific approval process for the technology to be used.	No self reporting mechanism.	In respect of monitoring of technology being used, no such process.

Figure 7: Matrix showing the as-is legal and regulatory framework at the national level for generation of wastewater after completion of industrial process

II. STATE LEVEL ASSESSMENT: BIHAR

Post consultation with the officials of Bihar Industrial Area Development Authority (BIADA) and the State Pollution Control Board (SPCB) of Bihar, the following points emerge when it comes to the as-is legal and regulatory framework for generation of wastewater post completion of industrial process:

- **Standards:** There are discharge standards laid down under the Environment Protection Rules for quantity & quality of discharge. However, no specific standards for quality and quantity of wastewater immediately post completion of industrial process in the state of Bihar.
- **Approval Mechanism:** Prior to operationalization of the industry, the EIA process and the CTE/CTO process by MoEF and the Bihar SPCB ensures that an approval from the aforesaid organizations has to be taken. In this process, the quality and quantity of wastewater to be generated is disclosed.
- **Self-Reporting Mechanism:** Currently, there is no self-reporting mechanism in place in Bihar which obligates the industrial unit to self-report the manner and the quantity and quality of wastewater that is being generated post completion of the industrial process.
- **Monitoring Mechanism:** In terms of monitoring, the Bihar SPCB does check the quantity and quality of water that is being discharged by an industrial unit to ensure compliance with discharge standards under Environment Protection Rules. However, there is nothing laid down in terms of monitoring of the quantity and quality of water that is being generated by the Bihar SPCB immediately after the completion of the industrial process.

Regulations Industrial Process Flow	Dimensions/Topics to be studied	Standards	Approval and Procedure	Operations	Monitoring
Generation of Wastewater post industrial process	Quantity	There are discharge standards laid down under the EP Rules for quantity & quality of discharge. However, no specific standards for quality and quantity of wastewater immediately post industrial process.	Prior to operation of industry, the EIA process and the CTE/CTO process ensures that an approval has to be taken from MoEF and SPCB respectively in which the quality of wastewater to be generated is to be disclosed.	NA	Bihar SPCB has the power to monitor compliance with discharge standards.
	Quality				
	Technology				

Figure 8: Matrix showing the as-is legal and regulatory framework in Bihar for generation of wastewater after completion of industrial process

III. STATE LEVEL ASSESSMENT: UTTARAKHAND

- **Standards:** There are discharge standards laid down under the Environment Protection Rules for quantity & quality of discharge. However, no specific standards for quality and quantity of wastewater immediately post completion of industrial process in the state of Uttarakhand.
- **Approval Mechanism:** Prior to operationalization of the industry, the EIA process and the CTE/CTO process by MoEF and the SPCB ensures that an approval from the aforesaid organizations has to be taken. In this process, the quality and quantity of wastewater to be generated is disclosed.

- **Self-Reporting Mechanism:** Currently, there is no self-reporting mechanism in place in Uttarakhand which obligates the industrial unit to self-report the manner and the quantity and quality of wastewater that is being generated post completion of the industrial process.
- **Monitoring Mechanism:** There are no specific rules/laws laid down in terms of monitoring of the quantity and quality of water that is being generated by the industries immediately after the completion of the industrial process.

d) EFFLUENT TREATMENT AT ETP/CETP

I. NATIONAL LEVEL ASSESSMENT

Sub components/Dimensions Studied: a) Quality of water that is being inlet into the CETP/ETP and quality of water at outlet point; b) Technology to be used by the CETP/ETP; and c) Personnel and skills for operating the CETP/ETP

Legal and Regulatory Framework: a) Standards; b) Approval Mechanism; c) Operating Mechanism; and d) Monitoring Mechanism

i) Quality of water at inlet and outlet points

In terms of **minimum standards**, the inlet standards for CETP mentioned under Environment Protection Rules drafted and framed under the Environment Protection Act. No specific inlet standards for individual ETPs. Outlet standards for both CETP and ETP as per wastewater discharge standards under Environment Protection Rules.

In respect of **approvals** required for the establishment of a CETP, the CETP is treated as just another industrial unit and therefore prior to operating the CETP, the CTE and CTO has to be taken from the SPCB. Also, for an industrial unit to be issued with a CTE and CTO, it has to have some form ETP and hence at the CTE and CTO application stage, the ETP's approval is provided by SPCB.

There are no **operational guidelines or norms, or procedures** laid down in respect of quality of water at inlet and outlet points when it comes to both CETPs and ETPs.

In terms of **monitoring** of operation of CETPs and ETPs specifically with respect to the CETPs and their adherence with inlet standards and their adherence with the discharge standards under Environment Protection Rules at the outlet point, the same is monitored by SPCB.

ii) Technology to be used by the CETP/ETP

As on date, there are no uniform **baseline standards** laid down for the type of technology that the CETPs or the ETPs are prescribed to follow. Since, there are no standards in the first place, there is no question of any specific **approval mechanism**. Further, there are no uniform **operational norms** in place for governing the day to day operations of the CETPs and the ETPs especially in terms of which technology they must use. As mentioned before, since there are no standards, there is no **monitoring mechanism** in place either for these CETPs and ETPs.

iii) Personnel and Skills for Operating the CETP/ETP

There are no minimum standards prescribing the qualifications and skills required for operating the CETPs and ETPs and hence without any such standards there is no specific approval mechanism in place before hiring any personnel to operate the CETPs or the ETPs for that matter. Furthermore, since there are no standards, there is no case of monitoring the skills and qualifications of the personnel who have been engaged to operate the CETPs and ETPs.

Industrial Process Flow	Dimensions	Standards	Approval/Procedure	Operation	Monitoring
Effluent Treatment (CETP/ETP) in India	Quality	Inlet standards for CETP mentioned under EP Rules. No specific inlet standards for individual ETPs. Outlet standards of both CETP and ETP as per discharge standards under EP Rules.	CETP treated as any other industrial unit and CTE/CTO has to be taken from SPCB before CETP operation. As per Supreme Court order, no industry can get CTE/CTO from SPCB without an operational ETP	No operational norms for the CETPs and for the ETPs.	CETPs are monitored by the SPCB to check whether the inlet and discharge standards are being adhered to.
	Technology	No technology standards are prescribed for CETP or ETP.	NA	No operational norms for the CETPs and for the ETPs.	Since there are no standards, there is no monitoring of the technology being used by CETP/ETP.
	Personnel/Skills	There are no baseline standards under law for personnel to be deployed for CETP/ETP.	No specific approval to be taken prior to deploying personnel at CETP/ETP.	NA	Since there are no baseline standards, there is no monitoring of personnel being used at CETP/ETP.
CASE STUDY- United States of America					
Effluent Treatment (CETP/ETP)	(Environment Protection Agency Standards and Clean Water Act)	EPA and the various state agencies of USA specify the standards to be followed by effluent treatment plants	Yes, approval has to be taken from EPA prior to operation of an effluent treatment plant.	The operation of the effluent treatment plants is regulated and discharge standards are fixed on basis of available technology.	EPA and the state agencies monitor periodically to ensure compliance with standards.

Figure 9: Matrix showing the as-is legal and regulatory framework at the national level for effluent treatment by CETPs and ETPs.

II. STATE LEVEL ASSESSMENT: BIHAR

Post consultation with the officials of Bihar Industrial Area Development Authority (BIADA) and the State Pollution Control Board (SPCB) of Bihar, the following points emerge when it comes to the as-is legal and regulatory framework for effluent treatment at CETPs and ETPs:

- Standards:** As per Environment Protection Rules, the inlet standards for CETP have been prescribed and laid down and the outlet standards from these CETP are the same as discharge standards under Environment Protection Rules. Bihar specifically does not have any other standards and follow the standards laid down under the Environment Protection Rules. For ETPs, there are no specific inlet standards in the state of Bihar, but the outlet standards are the same as the discharge standards under the Environment Protection Rules.
- Approval Mechanism:** CETP treated as any other industrial unit and prior to their operation and establishment, the CTE and CTO have to be taken from SPCB. In case of ETP, if an industrial unit does not have an ETP in place at the time of seeking the CTE and CTO, the CTE/CTO shall not be granted by SPCB.
- Operation Norms:** Currently, there are no operation norms for CETPs. However, as part of our consultation with BIADA it has been informed to us that BIADA and other relevant stakeholders are in the process of framing operational norms for CETPs.
- Monitoring Mechanism:** In terms of monitoring, it was mentioned during consultation with the Bihar SPCB officials, that SPCB does monitor whether the inlet standards at the CETPs under the Environment Protection Rules and the discharge standards at the outlet point are being adhered to.

Regulations Industrial Process Flow	Dimensions/Topics to be studied	Standards	Approval and Procedure	Operations	Monitoring
Effluent Treatment (CETP/ETP)	Quality	As per EP Rules, the inlet standards for CETP are prescribed and the outlet standards of CETP are the same as discharge standards under EP Rules. For ETP, there are no inlet standards.	CETP treated as any other industry and CTE/CTO have to be taken from SPCB prior to operation for CETP. In case of ETP, if an industrial unit does not have one CTE/CTO not granted by SPCB.	No operation norms for CETPs as of date. However BIADA in process of framing norms.	SPCB of Bihar does monitor the performance of CETPs/ETP on a periodic basis.
	Technology				
	Personnel/Skills				

Figure 10: Matrix showing the as-is legal and regulatory framework in Bihar for effluent treatment by CETPs and ETPs.

III. STATE LEVEL ASSESSMENT: UTTARAKHAND

- Standards:** As per Environment Protection Rules, the inlet standards for CETP have been prescribed and laid down and the outlet standards from these CETP are the same as discharge standards under Environment Protection Rules. There are no specific standards and the state follows the standards laid down under the Environment Protection Rules. For ETPs, there are no specific inlet standards, but the outlet standards are the same as the discharge standards under the Environment Protection Rules.
- Approval Mechanism:** CETP treated as any other industrial unit and prior to their operation and establishment, the CTE and CTO have to be taken from SPCB. In case of ETP, if an industrial unit does not have an ETP in place at the time of seeking the CTE and CTO, the CTE/CTO shall not be granted by SPCB.
- Operation Norms:** Currently, there are no operation norms for CETPs.
- Monitoring Mechanism:** In terms of monitoring, there is no concrete mechanism to monitor the inlet water to the CETPs as well as the discharge water.

IV. CASE STUDY OF USA

Primary legislation dealing with water pollution in the United States of America is the Clean Water Act (CWA) - a federal legislation. The law under Section 304 (d) requires Environmental Protection Agency (EPA) to formulate secondary treatment standards to be followed by publicly owned water treatment works (POTWs) i.e. effluent treatment plants.

The EPA has formulated and published secondary treatment standards based on an evaluation of performance data for POTWs practicing a combination of physical and biological treatment to remove biodegradable organics and suspended solids. The regulation also includes an alternate set of standards that apply to certain facilities employing waste stabilization ponds or trickling filters as the principal process.

However, USA being a federal country, empowers state environmental agencies to lay down standards more stringent than the standards laid down by the EPA, especially with respect to certain water bodies where the POTW seeks to discharge water into post treatment.

The CWA also requires each POTW to take out the NPDES permit before outlet of wastewater. NPDES permit also specifies technology-based effluent limitations (TBELs) which are the minimum level of treatment of pollutants for point source discharges based on available treatment technologies

e) DISCHARGE OF WASTEWATER AND RE-USE OF WASTEWATER

I. NATIONAL LEVEL ASSESSMENT

Sub components/Dimensions Studied: a) Quality of wastewater that is being discharged; b) Quantity of wastewater that is being discharged; and c) Types of re-use of wastewater

Legal and Regulatory Framework: a) Standards; b) Approval Mechanism; c) Self Reporting Mechanism; and d) Monitoring Mechanism

i) **Quality of Wastewater discharged**

In terms of **standards**, the quality of wastewater that is being discharged on land surfaces or water bodies post treatment at ETPs or at CETPs shall be as per discharge standards laid down under the Environment Protection Rules. It may be noted that for certain specific industry sectors, specific discharge standards have been laid down while for all other industrial unit's general discharge standards have been laid down under the Environment Protection Rules. However, there are no baseline standards laid down anywhere at the national level specifying the quality of wastewater for the purpose of re-use.

In respect of **approvals** needed, prior to operation and establishment of the industrial unit, the quality of wastewater to be discharged and the place of discharge i.e. land surface, water body, etc., has to be intimated to SPCB as per CTE/CTO approval process and also to MoEF during the EIA process. However, for re-use of waste water there is no specific approval process specified.

There is no **self-reporting mechanism** in place specifying that the industrial unit has to periodically inform any regulatory authority the quality of wastewater that is being discharged.

In terms of **monitoring** the quality of wastewater discharged, the SPCBs have been empowered to monitor the quality of wastewater discharged and the compliance of the industrial unit with such discharge standards and the SPCBs perform such monitoring function on a periodic basis. The period differs from state to state.

However, for re-use of wastewater since there are no specific standards, there is also no monitoring of how wastewater is being reused.

ii) **Quantity of Wastewater discharged**

In terms of **standards**, the quantity of wastewater that is to be discharged on land surface or water bodies shall be as per the discharge standards laid down under the Environment Protection Rules which have been framed under the Environment Protection Act. It may be noted that for certain specific industry sectors, specific discharge standards have been laid down while for all other industrial unit's general discharge standards have been laid down under the Environment Protection Rules. However, there are no baseline standards laid down anywhere at the national level for the quantity of wastewater which may be re-used.

In respect of **approvals** needed, prior to operation and establishment of the industrial unit, the quantity of wastewater to be discharged and the place of discharge i.e. land surface, water body, etc., has to be intimated to SPCB as per CTE/CTO approval process and also to MoEF during the EIA process. However, for re-use of waste water there is no specific approval process specified.

There is no **self-reporting mechanism** in place specifying that the industrial unit has to periodically inform any regulatory authority the quantity of wastewater that is being discharged.

In terms of **monitoring** the quantity of wastewater discharged, the SPCBs have been empowered to monitor the quantity of wastewater discharged and the compliance of the industrial unit with such discharge standards and the SPCBs perform such monitoring function on a periodic basis. The period differs from state to state. However, as mentioned before, there is no monitoring with respect to the re-use of wastewater.

iii) **Types of Re-use of Wastewater**

As of date, there are no specific standards with respect to types of re-use of wastewater. Since there are no baseline standards laid down for re-use there is no self-reporting mechanism or monitoring mechanism in place.

Industrial Process Flow	Dimensions	Standards	Approval/Procedure	Reporting Structure	Monitoring
Discharge of Wastewater/Reuse of Wastewater in India	Quantity	Quantity of discharge of wastewater is as per the standards laid down under the EP Rules. No standards for quantity of wastewater for re-use.	Prior to discharge, the quantity of water to be discharged has to be intimated to SPCB as per CTE/CTO and also to MoEF as per EIA. No approval process specified for re-use of wastewater.	There is no self-reporting by the industry for discharge of quantity of wastewater.	SPCB monitors the amount of wastewater being discharged by way of periodic monitoring and sampling.
	Quality	Quality of discharge of wastewater is as per the standards laid down under the EP Rules. No standards for quality of wastewater for re-use.	Prior to discharge, the quantity of water to be discharged has to be intimated to SPCB as per CTE/CTO and also to MoEF as per EIA. No approval process specified for re-use of wastewater	There is no self-reporting by the industry for discharge of quality of wastewater.	SPCB monitors the quality of wastewater and compliance of discharge standards by way of periodic monitoring and sampling.
	Type of re-use	Water Act mentions "Reuse"/ "Recycling" of water, however there are no specific standards with respect to types of re-use or re-use of waste water. Further, the thermal power plants are mandated to use treated wastewater from any STP from ULBs within 50km.	No specific approval process for re-use of waste water.	Since there are no baseline standards, there is no reporting mechanism,	Since there are no standards, there is no monitoring of re-use.
CASE STUDY- Spain					
Discharge of Wastewater/Reuse of Wastewater	(Royal Decree 1620/2007)	Yes, there are standards prescribed in the statute for each type of re-use.	Yes, prior to re-use an approval and license has to be taken from appropriate authority	Yes, there is a self reporting mechanism in place	Yes, the statute prescribes for monitoring by the appropriate authority.

Figure 11- Matrix showing the as-is legal and regulatory framework at the national level for discharge of wastewater and re-use of wastewater

II. STATE LEVEL ASSESSMENT: BIHAR

Post consultation with the officials of Bihar Industrial Area Development Authority (BIADA) and the State Pollution Control Board (SPCB) of Bihar, the following points emerge when it comes to the as-is legal and regulatory framework for discharge of wastewater and re-use of wastewater:

- **Standards:** As per Environment Protection Rules, the discharge standards have been laid for all industrial units. Bihar SPCB follows and enforces the discharge standards laid down under the Environment Protection Rules. However, like most of the country, Bihar does not have any specific standards for re-use of wastewater.
- **Approval Mechanism:** As per the Water Act, permission of the SPCB has to be taken before discharging wastewater into land or water body. Further, the CTE and CTO process ensures that the industrial unit specifies and discloses the quality, quantity and place of discharge of wastewater. However, like the rest of the country there is no specific approval mechanism for reuse of wastewater.
- **Self-Reporting Mechanism:** Currently, there is no self-reporting mechanism which have been put in place in Bihar which obligates the industrial unit to Suo motu report the quantity and quality of wastewater being discharged on a periodic basis.

- Monitoring Mechanism:** In terms of monitoring, it was mentioned during consultation with the Bihar SPCB officials, that SPCB does monitor on annual or six-monthly basis by way of sampling of the wastewater being discharged by an industrial unit to check whether said industrial unit is complying with the discharge standards laid down under the Environment Protection Rules.

Regulations Industrial Process Flow	Dimensions/Topics to be studied	Standards	Approval and Procedure	Self Reporting	Monitoring
Discharge Wastewater/Reuse Wastewater	Quantity	Quantity Standards for discharge have been provided under EP Rules. However, no common set of standards for various types of re-use of waste water.	Water Act does state that industries have to take the consent of SPCBs before discharging water. No such approval process as of now for re-use.	There is no self reporting mechanism in place.	SPCB of Bihar on annual or six monthly basis samples the water being discharged by industrial unit to check compliance. There are also EIA post monitoring mechanisms in place. However, there is no monitoring of reuse of wastewater
	Quality				
	Types of Re-use				

Figure 12: Matrix showing the as-is legal and regulatory framework in Bihar for discharge of wastewater and re-use of wastewater

III. STATE LEVEL ASSESSMENT: UTTARAKHAND

- Standards:** As per Environment Protection Rules, the discharge standards have been laid for all industrial units. The SPCB follows and enforces the discharge standards laid down under the Environment Protection Rules. However, there are no specific standards for re-use of wastewater.
- Approval Mechanism:** As per the Water Act, permission of the SPCB has to be taken before discharging wastewater into land or water body. Further, the CTE and CTO process ensures that the industrial unit specifies and discloses the quality, quantity and place of discharge of wastewater. However, there is no specific approval mechanism for reuse of wastewater.
- Self-Reporting Mechanism:** Currently, there is no self-reporting mechanism which have been put in place in Uttarakhand which obligates the industrial unit to self-report the quantity and quality of wastewater being discharged on a periodic basis.
- Monitoring Mechanism:** In terms of monitoring, there is no concrete mechanism to monitor the discharge of treated water or re-use of the same by the industries.

I. **CASE STUDY OF SPAIN**

In Spain, there is a standalone law dealing with the re-use of waste water. Spanish law (Royal Decree 1620/2007) defines the term reclaimed water. Reclaimed water is wastewater that has been submitted to a rigorous treatment process in a water reclamation facility (WRF) and can thus be directly employed for more restricted uses (irrigation, industrial uses, environmental uses, etc.), without being diluted by other water flows.

Annex I.A of the Spanish Law lays down the manner and ways in which the reclaimed water may be reused. For each of these reuses, law prescribes water quality parameters which the reclaimed water has to fulfil. The uses prescribed for reclaimed water includes:

- Urban Uses (irrigation of parks and gardens, street cleansing, washing of vehicles, industrial hydrants)
- Agricultural Uses (crop irrigation systems, aquaculture, irrigation of pasture land for milk, irrigation of ornamental flowers/nurseries/greenhouses)
- Industrial Uses (process and cleaning water except for food industry, cooling tower and evaporative condensers)
- Recreational Uses (golf course irrigation and ornamental lakes)
- Environmental Uses (local aquifer recharge, irrigation of woodlands and mini-forests, maintenance of wetlands)

Spanish Law also prescribes that prior to reuse of reclaimed water, the water has to be tested and sampled at the outlet point of the water reclamation facility (WRF). The parameters for testing have been prescribed in Annex I.B of the Royal Decree 1620/2007.

The Spanish Law- Royal Decree 1620/2007- states that prior to re-use of reclaimed water, the user of such reclaimed water has to take an administrative concession under the Water Act of Spain

8 Potential Areas of Intervention

Based on the detailed analysis, the gaps and deficiencies in the existing system have been identified and studied in detail. This has also helped in obtaining clear understanding on the core reasoning for the failure of the procedures, processes, Acts, rules, directives, notification, regulations etc. The key potential areas of intervention and suggestive recommendations across each node of the value chain are as follows:

1. Raw Water Supply Input to Industry
 - ✓ A law or a regulation may be laid down by CGWA or other bodies responsible for regulating use of surface water mandating the baseline standards and thereafter monitoring for quality of raw water to be supplied to industry
 - ✓ A law or a regulation mandating the self-reporting of quantity and quality of raw water used to SPCBs. Also, a consolidated law/statute stating requirement of a license or permit to use ground and surface water
2. Utilisation of water in Industrial Processes
 - ✓ A regulation/notification may be framed at the central level under EP Rules stating the technology that may be used for various types of industries to ensure less effluents at the time of discharge of waste water.
3. Generation of wastewater post Industrial Processes
 - ✓ At the state level, a self-reporting tool ought to be formulated by SPCB to ensure that wastewater quality can be monitored immediately after completion of industrial process
 - ✓ At the level of the SPCBs, at the state level, a monitoring tool, perhaps by using ICT solutions to monitor the amount and quality of wastewater immediately after industrial process.
4. Effluent Treatment CETP/ETP
 - ✓ Formulation of set or rules and regulations laying down the minimum personnel requirement for operation of CETPs by the state industrial development authorities
 - ✓ In case of the ETPs, at the state level enactment of a set of self-reporting rules and laying down of inlet standards by the SPCB specifically for the ETPs.
5. Discharge of treated water/re-use
 - ✓ Enactment of a statute specifying the standards for re-use of waste water for various types of uses (agriculture, industry, recreational) as well as laying down of an approval process for entities which are interested in re-use
 - ✓ Statute mentioned above would also lay down the monitoring mechanism for re-use of waste water, perhaps by way of ICT tools.

Further, the above-mentioned areas of intervention shall also require the following to ensure effective compliance and monitoring

1. Compliance/Pollution Monitoring:
 - ✓ Strengthening of penal provisions under environmental laws for non-compliances
 - ✓ Legal framework for Environmental Compensation
2. ICT Based Tools:
 - ✓ ICT based dashboard for repository of Environmental law with improved user interaction
 - ✓ Environmental Self-Assessment Tool (to check compliance with Environmental legislation)

9 Detailed Recommendations/Suggestions

This section delineates some of the key recommendations in detail:

9.1 National Environmental Law Portal

Objective:

- Ensuring that there is a common database/repository for all applicable environmental laws in India

Scope:

- To develop a common platform explaining the applicability of each law which is otherwise difficult for stakeholders to understand and comply.
- Updating the amendments to environmental rules/regulation/standards take place frequently and have an adequate mechanism for capturing the changes to rules/regulations/standards on real time basis

Benefits:

- Database of case laws (ranging from NGT to SC) dealing with each of the rules, regulations, standards laid down from time to time
- Classification of environmental laws on the basis of type of pollution
- A ready reckoner explaining applicability of each law and the purpose of such law

Beneficiaries:

- Industrial Units
- CPCB, SPCB

9.2 Environment Self-Assessment Tool

Objective:

- To have a self-assessment mechanism that allows for monitoring of performance and efficient compliance to the environmental laws.

Scope:

- To create a tool in order to have consolidated data on an online platform providing access for authorities, corporations and industries to track the performance on a timely basis.

Benefits:

- Create transparency and involve the responsible stakeholders in decision-making processes and environmental assessments
- Common protocol that the industries must follow to identify risks and take necessary actions in a timely manner.

Beneficiaries:

- Industrial Units
- CPCB, SPCB

9.3 Standards for Re-use of treated Industrial wastewater

Objective:

- Ensuring that the waste water generated post completion of industrial process is either re-used by the industries themselves (ZLD) or for other recreational and agricultural purposes.
- Ensuring minimal wastage of natural resource such as water

Scope:

- Enactment of a standalone statute or issuance of a direction under EP Act by the Central Government which shall lay down the standard which the wastewater has to adhere to and the amount of treatment that shall be required vis-à-vis each of the uses of water- industrial, agricultural, recreational, etc.
- Laying down the approval process which will have to be adhered to prior to an entity re-using wastewater as well as monitoring mechanism to ascertain whether the wastewater is being properly re-used.

Benefits:

- Will ensure transparency such that all stakeholders are aware of the standards of treatment that shall be required for such waste water to be re-used for each purpose.
- Will also lay down a comprehensive regulatory framework at the central level which shall govern the re-use of waste water in the country

Beneficiaries:

- Local Communities
- Industrial Units

9.4 Legal tool for levying Environmental Compensation

Objective:

- Ensuring that there is a deterrence for industrial units for flouting industrial water discharge standards, SPCB orders, CTE/CTO conditions, for operating without an ETP and for illegal extraction of groundwater.

Scope:

- Currently, there are draft environmental compensation formula issued by CPCB post NGT directions. Using Section 5 of the Environmental Protection Act, MoEF may issue an order empowering CPCB to issue final and binding environmental compensation formula which may be adopted by respective SPCBs. In the long run, separate rules under the EP Act may be formulated specifically for EC.
- Environmental compensation may be levied by SPCB and CGWA or any other authority prescribed by the CPCB.

Benefits:

- Will act as a deterrent to industrial units and will prevent them from flouting directions of SPCB, not complying with SPCB norms, etc.
- A formalized mechanism of environmental compensation will have a legally binding effect and will empower regulatory authorities to impose environmental compensation on errant units

Beneficiaries:

- Local Communities
- Preservation of natural resources

10 Gap Analysis Report Approval

Approver's Name: _____

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Organization: _____

Approver's Signature: _____

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