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Stakeholder Consultation Workshop on

"Gap and Needs Analysis on Industrial Wastewater Management"

under SEIP-II

Detailed programme report

Date: 22nd November, 2019
Venue: Tangerine Hall, Lemon Tree Hotel, Aerocity, New Delhi

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1. Introduction

The Sustainable and Environment-friendly Industrial Production (SEIP-II) is a project undertaken by the Ministry of Environment, Forest and Climate Change (MoEFCC) together with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. The project is a part of the Indo-German Technical Cooperation. The SEIP project aims at enabling public and private stakeholders in India to come together for efficient, environment-friendly, and climate-friendly industrial development.

The first phase of SEIP was focused on undertaking demonstration projects and documenting learnings in the form of knowledge products. The first phase of SEIP was implemented from 2015 to 2019. It focused on issues pertaining to wastewater conveyance, treatment, recycle/reuse, waste management, monitoring, process modification in individual industries, etc. For undertaking the demonstration activities, five industrial estates were chosen across three states (Uttarakhand, Delhi and Gujarat). Some of the outputs of this phase included publication of sustainability standards, development of digital platforms for industrial estates as well as training and skill development.

The second phase of SEIP (from March 2019 to February 2022) aims at creating an enabling environment for scaling up the efforts of the first phase. SEIP now focusses on four key outputs viz. strengthening of the legal framework, strengthening organizational procedures and processes, strengthening of incentive mechanism and strengthening of knowledge products. At the national level, the key stakeholder for this phase are Ministry of Environment, Forests and Climate Change (MOEFCC) along with the Central Pollution Control Board (CPCB). At the state level, this phase of the project would have activities in the states of Uttarakhand, West Bengal and Bihar.

As a part of the project, *Gaps and Needs Analysis Studies* (Baseline studies) had been initiated by GIZ to assess the current situation for each of the above-mentioned the output. This was carried out at National level and in Uttarakhand (at State level) by consultants corresponding to each of the four outputs namely:

Output 1- Strengthening of legal framework – **Ernst & Young**
Output 2- Strengthening of Organisational structures and processes - **Deloitte**
Output 3- Incentive mechanisms to reduce industrial pollution - **CRISIL**
Output 4- Knowledge products - **National Productivity Council**
Output 5- Resource efficiency (RE) and sustainable consumption & production (SCP) - **National Productivity Council**

While the consultants corresponding to each of the four outputs had completed an initial assessment of gaps, there was a need to verify this with stakeholders at the ground level. Consequently, a Stakeholder Consultation Workshop on "*Gaps and Needs Analysis on Industrial Wastewater Management*" was organized on 22nd November 2019, New Delhi by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH together with Ministry of Environment, Forests & Climate Change (MoEFCC) and Central Pollution Control Board (CPCB).

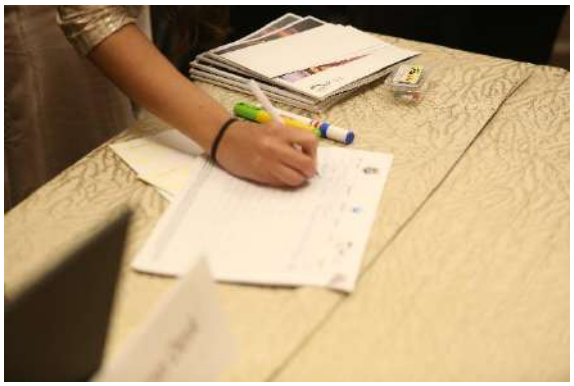
The intention behind the organized workshop was to share and verify the initial gaps identified under each of the four outputs and obtain feedback on the findings of the identified gaps and needs pertaining to legal framework, institutional framework, incentive mechanisms and knowledge products (guidelines, methods, resource efficiency approaches etc.). The finalised needs will help the SEIP II project to prioritise them and start working on solutions in consultation with MoEFCC, CPCB and other partner organisations in the States of Uttarakhand, Bihar and West Bengal.

2. Programme Overview

The programme schedule of the Stakeholder Workshop is given at Annexure 1.
The presentations used in the workshop are available in Annexure 2.

3. Workshop Proceedings

The participants at the workshop included the GIZ team, consultant teams corresponding to each of the four outputs under SEIP 2 and various stakeholders including industry representatives, government officials, sector experts, etc. The workshop involved an introductory presentation on SEIP II and the workshop agenda by the GIZ team followed by presentations on each of the outputs by the concerned consultants. The presentations were interspersed by comments, suggestions and questions raised by the participants.



4. Outline of presentations

Each of the presentation presented a baseline assessment and identification of key gaps. The series of presentation made were as follows:

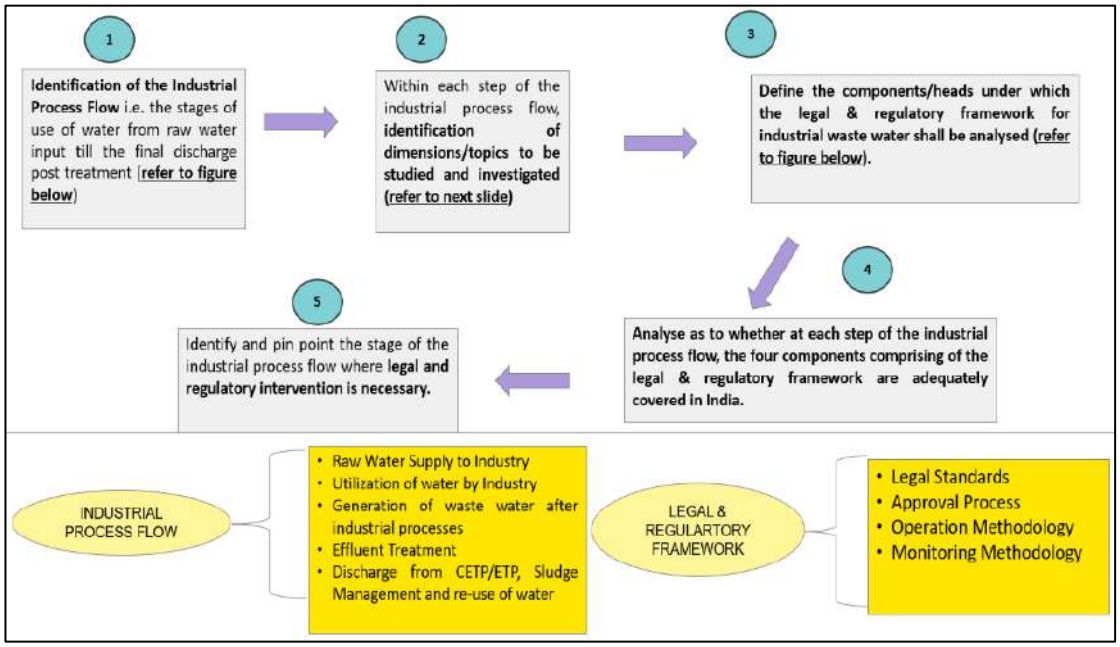
- Presentation on SEIP II and workshop agenda by GIZ
- Presentation on gap analysis of legal and regulatory frameworks related to sustainable industrial wastewater management by EY
- Presentation on gap analysis of the organizational structure, processes and procedures in relation to industrial wastewater management by Deloitte

- Presentation on gap analysis of incentive mechanisms for sustainable industrial wastewater management by CRIS
- Presentation on gap analysis of knowledge products for sustainable industrial wastewater management by NPC

5. Approaches followed:

5.1 Output 1: Strengthening of legal framework

EY, mandated by GIZ for Output-1 "Consultancy Services for analysis of the legal bases & rules and regulation at National and State, Output-1" presented the approach that was adopted in conducting this study which involved the review of legal and regulatory framework across each node of the value chain from raw water supply to industry to discharge of treated water/re-use.



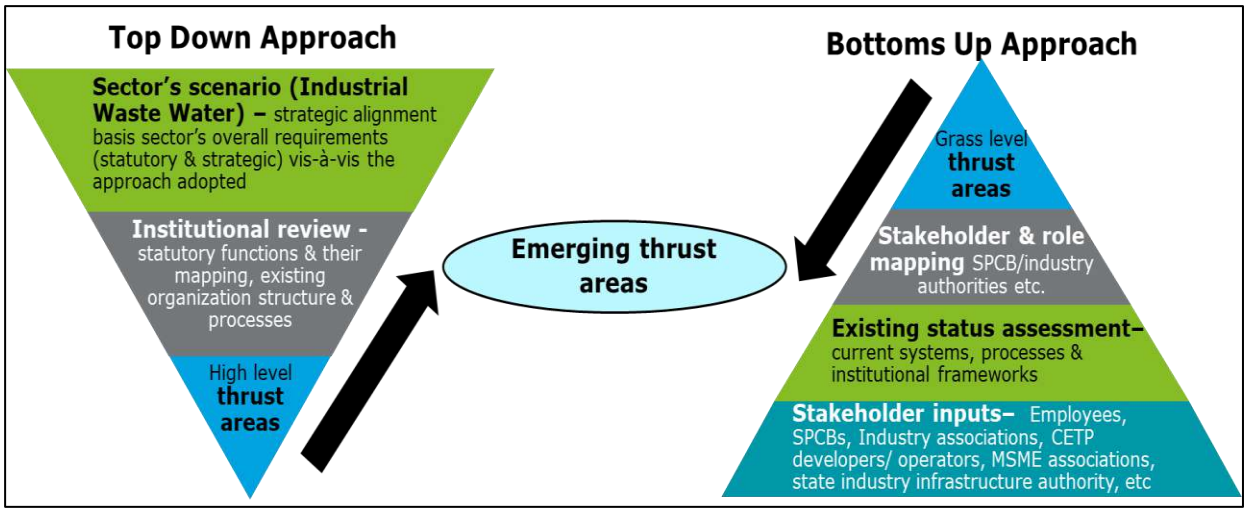
5.2 Output 2: Strengthening of Organisational structures and processes

Deloitte, mandated by GIZ for Output-2 "Consultancy Services for analysis of the organizational structures, procedures and processes of public agencies at National & State (Uttarakhand) level to effectively combat industrial wastewater pollution, Output-2" presented their approach focussing on:

(a) identifying key thrust areas, and

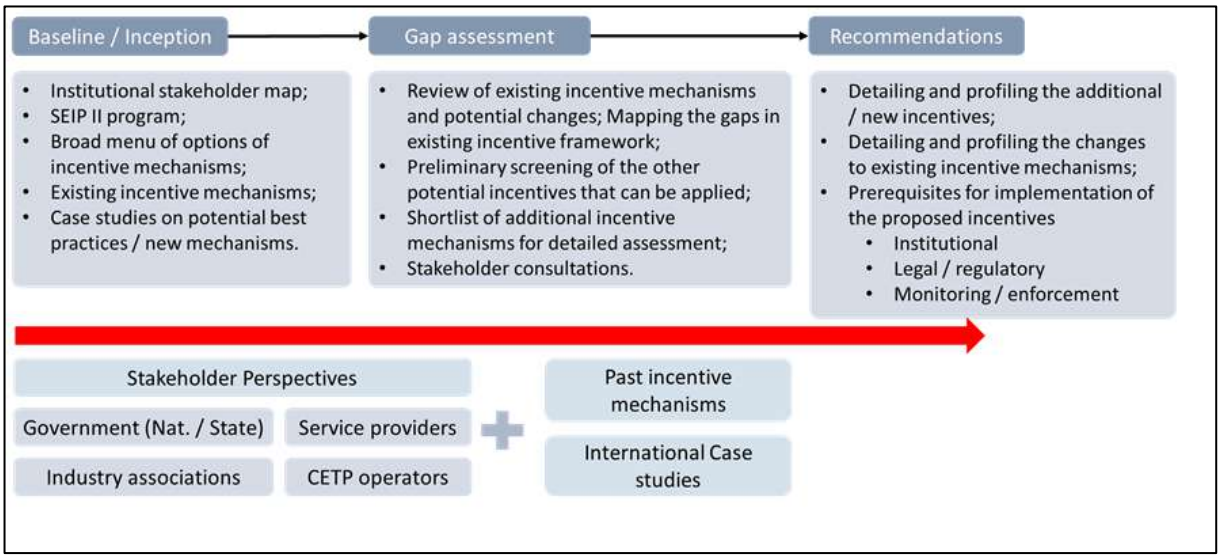
(b) identifying suitable solutions for these thrust areas.

The below diagram depicts the two-pronged approach adopted, to identify the key thrust areas, in each organization.



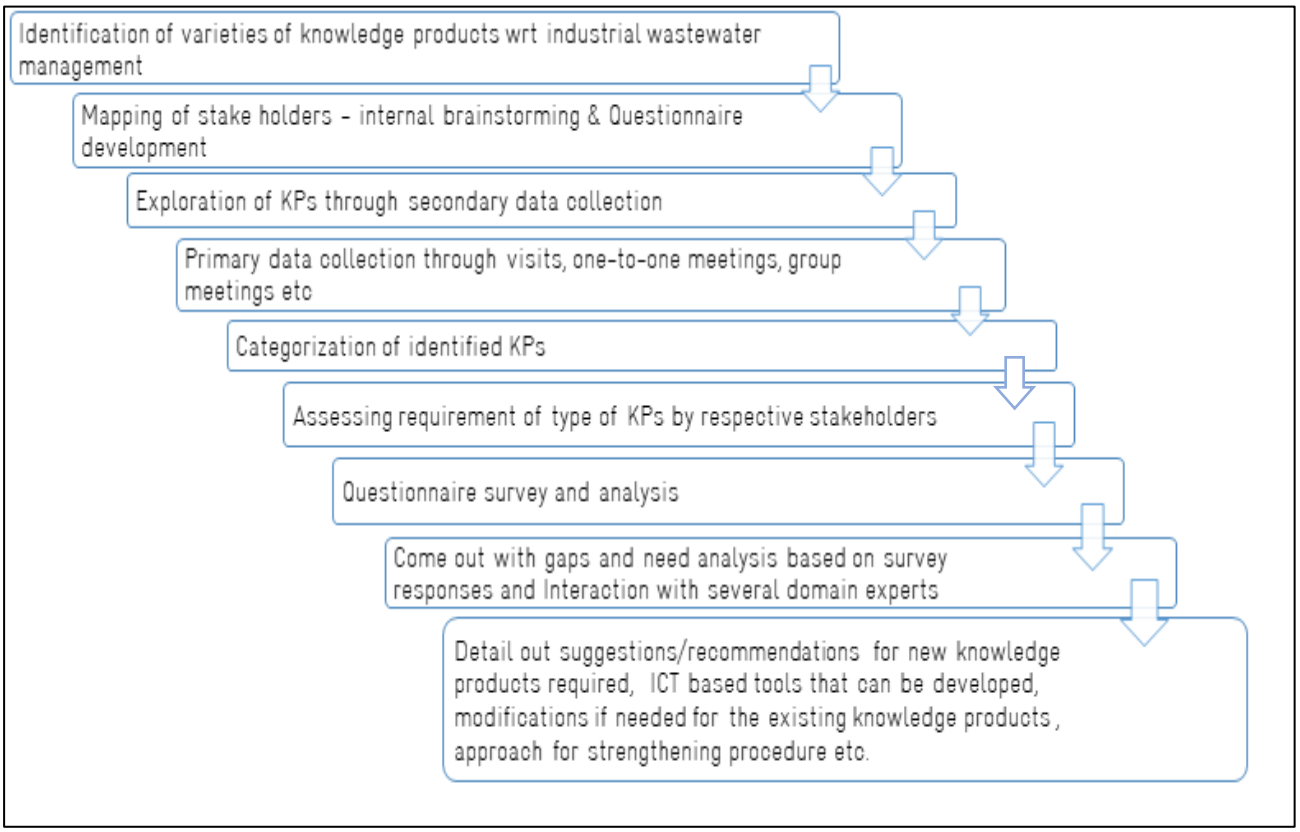
5.3 Output 3: Incentive mechanisms to reduce industrial pollution

CRIS team, mandated by GIZ for Output-3 "Consultancy Services for analysis of existing incentive mechanisms for industrial wastewater management, Output-3" made a presntation on the existing incentives, key gaps and proposed recommendations. The following aspects were presented and discussed upon:



5.4 Output 4 & Output 5: Knowledge Products & Resource efficiency (RE) and sustainable consumption & production (SCP)

NPC team, mandated by GIZ for Output-4 "Consultancy Services for analysis of existing knowledge products available for industrial wastewater management at National and State level (Uttarakhand)- Output - 4", presented the approach adopted by them, as depicted below:



6. Key Gaps

6.1 Output 1: Strengthening of legal framework

The following gaps were elaborated for Output 1:

(a) Standards must be notified by the Central Government under the Environment Protection Rules specifying the standards which wastewater must meet for various uses. Different standards to be prescribed for different end uses.

(b) Mandatory self-reporting by the industrial units with respect to the gaps specified including but not limited to quantity and quality of raw water used, water utilisation by type, the type of personnel deployed by the CETPs, etc.

(c) Mandatory and time bound monitoring by the SPCBs of the industrial units with respect to the gaps specified including but not limited to checking quality of

raw water being used, whether CETP/ETP are deploying qualified personnel, whether re-user of wastewater is adhering to the re-use standards, etc.

(d) Mandatory environmental compensation for illegal extraction of groundwater and violation of discharge standards has been devised by CPCB under the directions of NGT and Supreme Court

(e) Reference documents may be issued by the Central Government recommending the recommended best available methods pre-treatment of raw water, best available technology which may be adopted when it comes to achieving ZLD or minimize water pollution from discharge of effluents and best technology which may be adopted by CETP/ETP.

6.2 Output 2: Strengthening of Organisational structures and processes

For Output 2, the following key points were highlighted:

(a) NIC code linking with pollution index is the priority to have proper Inventorisation of industries and linking of pollution index

(b) Third Party agencies for monitoring and compliance reporting to have effective coverage on ground and for this to develop overall policy and framework for engaging competent agencies

(c) The Central and State Boards work with various partners but mostly in an informal arrangements, the need is to define these partnerships with more formal structures.

(d) To undertake capacity building of pollution control board officials, there is a requirement to develop short and preferably e-learning modules

(e) There is a need for developing an overall framework for CETP development including the business model, techno-commercial guidelines, institutional strengthening with clear roles and responsibilities of various public and private agencies/stakeholders involved in development and operations and maintenance of such assets

(f) The discussions on organization structure were in the context of realignment of the teams from current sectoral focus to the functional and geographical focus

(g) To have a structured mechanism for revision of industry standards with a rolling plan

6.3 Output 3: Incentive mechanisms to reduce industrial pollution

The following ideas were discussed in respect to Output 4:

(a) It was agreed that benefits in form of ease of doing business, recognition and reduced tax rates are preferred by industries over direct financial incentives such as capital grants.

(b) With respect to effluent charges, the following comments were raised:
- Getting stakeholder consensus was highlighted as a concern.
- The need for an additional revenue source for state pollution control boards (which would be levying the charge) was questioned.
- In terms of design of the levy, two areas which were highlighted were
  - whether the effluent charge would be linked to effluent load, concentration or volume,
  - the permissible uses of funds generated from such a levy

(b) With respect to the environmental compensation, currently being levied in accordance with the NGT order, it was highlighted that it does not take into account the extent of pollution (in terms of pollution load, volume or concentration).

(c) It was advised that tax benefits such as differential GST rates, income tax relaxations, etc. also be considered as potential incentives

(d) The need for establishing business case as an incentive, rather than government subsidies, was also discussed. The use of tradable effluent permits and PPP models for setting up common effluent treatment plants were discussed an examples. In relation to the use of tradable effluent permits, it was agreed that this could only be applied where large homogenous industrial clusters exist within a well-defined geographic area.

6.4 Output 4: Knowledge Products

The following aspects were elaborated for Output 4:

(a) Strengthening of:
- Existing web based portal ENVIS for compiled database of all existing knowledge products
- Existing water quality portal – India WRIS by Ministry of Jal Shakti. Incorporating water quality data from industries and provision for data analysis / interpretation / integration

(b) Development of:
- Guidelines and/or Mobile Application for Field inspection checklist for regulatory bodies
- Guidelines for online monitoring mechanism (focused on instrumentation
- Manual and/or Mobile Application for Operation, maintenance, trouble shooting and monitoring of wastewater treatment plants / sludge management
- Manual for an empirical approach / calculation to calculate the extent of damage caused by pollution
- Guidelines for Treated water / process reject water reuse applications bases on its quality
- Online course for wastewater professionals

6.5 Output 5: Resource efficiency (RE) and sustainable consumption & production (SCP)

The following aspects were elaborated for Output 5:

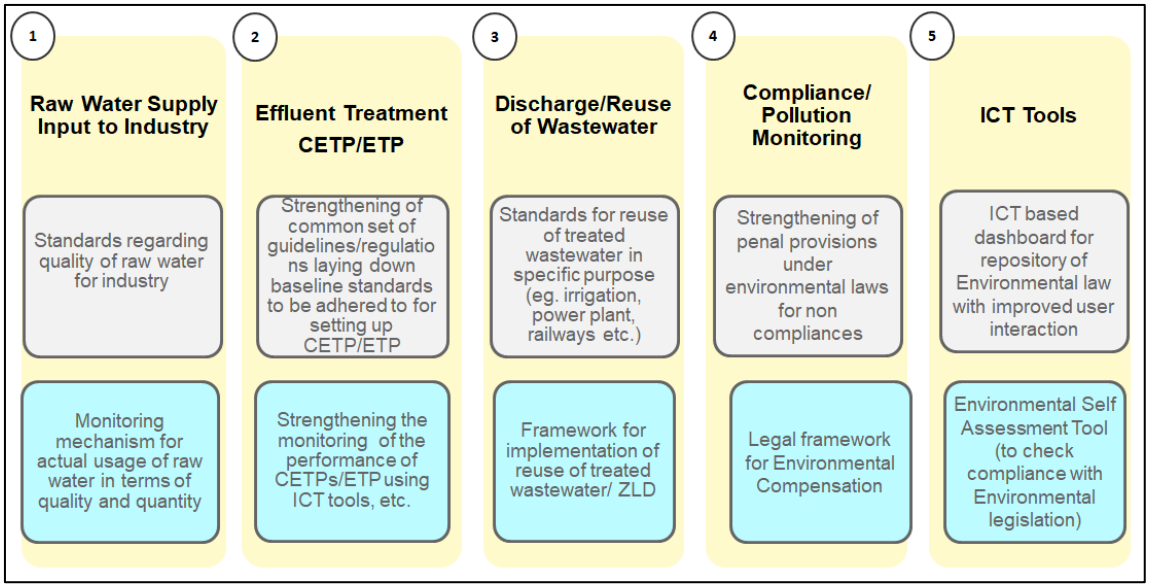
(a) Upgraded / revised COINDS for 54 sectors and for new sectors
(b) Electronic toolboxes (combination of existing research papers, project initiatives, success stories etc.) for a wide range of sectors
(c) Ecolabeling framework and harmonized database for India and other countries
(d) Eco product database (country wise, product wise, sector wise)
(e) Green finance for SCP and its framework, schemes, incentives, standard RFPs etc.
(f) Policy compendium on SCP (National & international)

(g) Sectoral case studies and comparative insights on benchmarks for resource efficiency
(h) Circular economy framework and related projects and schemes and MFCA (material flow cost accounting) initiatives and Green lean programme
(i) SCP related awards (criteria, past assessments and insights)
(j) SCP related research calls, frameworks and design components

7. Potential Areas of Intervention:

During the workshop, the participants discussed extensively, and the following areas are proposed as potential areas of intervention, subject to approval of the partner.

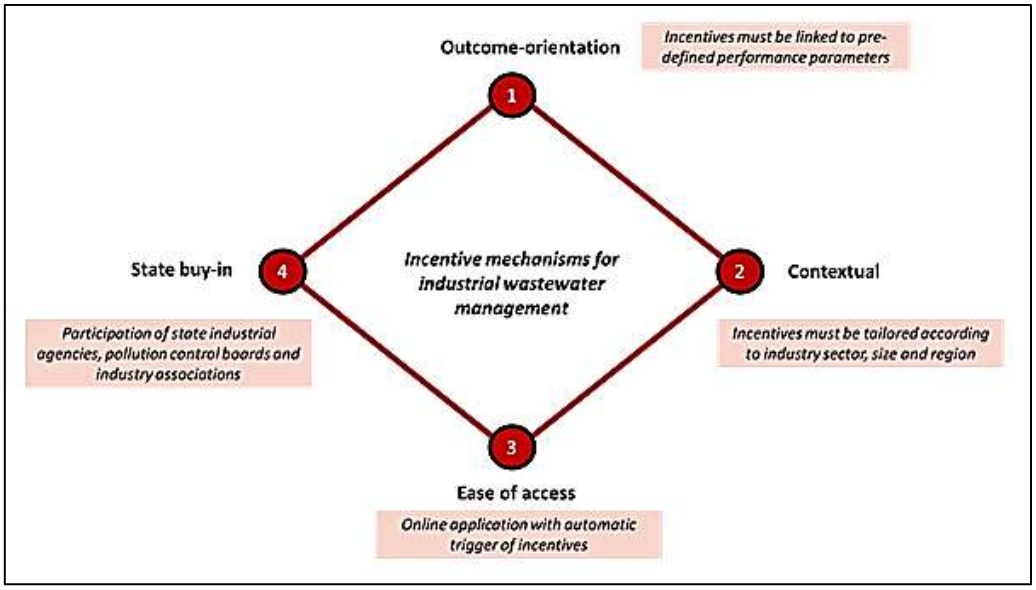
7.1 Output 1: Strengthening of legal framework by EY



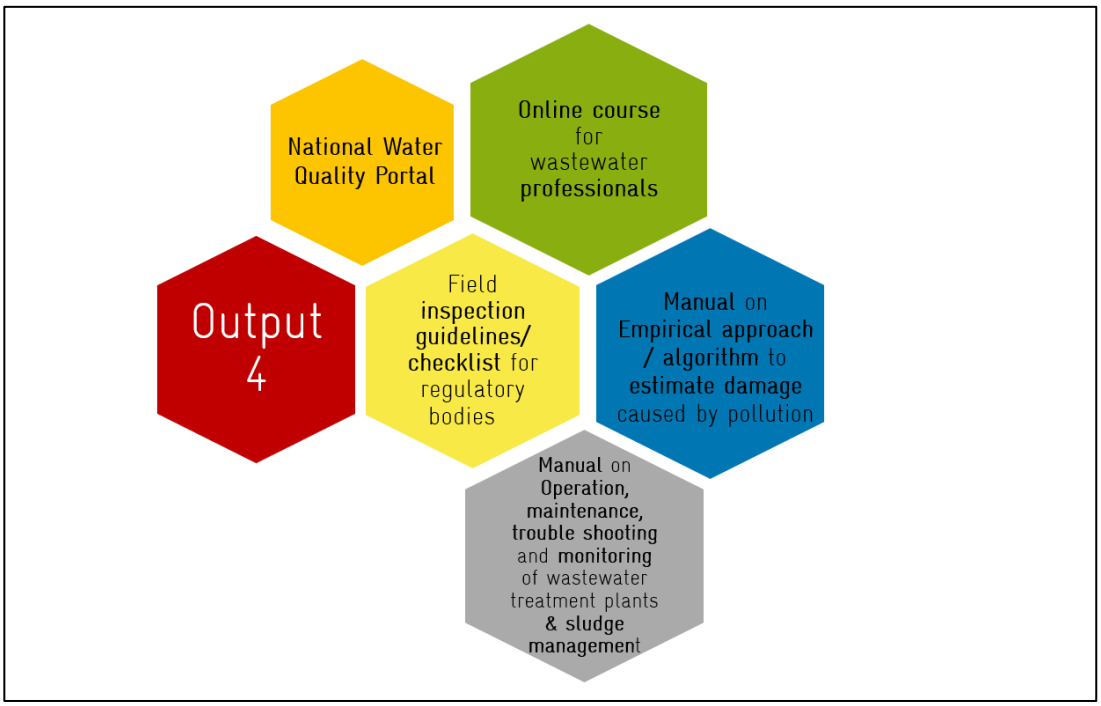
7.2 Output 2: Strengthening of Organisational structures and processes by Deloitte

Type	Suggestions	Outcome	Impact	Examples
Tools / System interventions	1 **Integrated Industry Portal**, NIC code	Linked NIC code, ASI data - inventory of all industries in one portal	**All IPC divisions**, saves time	**USEPA** using NAICS code
Process interventions	2 Strategic outsourcing to TPAs - **Pollution Audit Policy**	Guidebook for deploying & empaneling TPAs, payment strategy, etc.	**All IPC divisions**, saves time & better efficiency	**GPCB**, **USEPA** with LIMS
	3 Framework for **reuse & recycling** of industrial wastewater	Quality standards, legal framework & guidelines – pricing, trading models	**All SPCBs**, enables adoption	**Israel & Singapore's** national policies
	4 Guidelines for developing & managing **Env. infrastructure**	CETP development & sludge disposal – technology, business model, competency, etc.	**IPC VII**, proactive measure for future, efficient practices of **states**	**USEPA & Australia** for managing operators
Structural interventions	5 **Realigning IPC division** with functional focus	(1) Standard formulation (Sectoral alignment), (2) Monitoring (area) (3) Tech. & Financial Assistance	**Staff of all IPC**, better staffing & management of resources	**USEPA's** org structure

7.3 Output 3: Incentive mechanisms to reduce industrial pollution by CRISIL



7.4 Output 4: Knowledge Products by NPC



7.5 Output 5: Resource efficiency (RE) and sustainable consumption & production (SCP) by NPC

Sectoral case studies and comparative insights on benchmarks for resource efficiency

8. Synthesis and key takeaways

- There is a broad agreement to the gaps identified with respect to existing scenario in the field of sustainable industrial wastewater management.
- There is also interest in hosting a recognition-based incentive to reward industries which are going beyond regulatory compliance in their pollution control efforts.
- There is consensus on the need to adopt third party audits as a means to strengthen the monitoring framework with respect to industrial waste water pollution.
- Need to encourage industries to stay ahead of regulatory curve
    - Industries should not limit environment protection efforts to regulatory compliance requirements
    - Industries should adopt best available technology and practices for environment protection
- There is a need for developing an overall framework for reuse and recycling of treated industrial wastewater including the standards for category wise usage, business models, techno-commercial guidelines, roles and responsibilities of various stakeholders etc.
- To develop a knowledge platform and e-portal for industrial wastewater sector for member industries to have easy access to recent technologies and good process practices etc.
- Advanced portal for water quality data analysis
- A networking portal for all stakeholders may be developed for knowledge and experience sharing amongst all wrt to pollution prevention / mitigation, trouble shooting of wastewater treatment plants etc.
- Create web based platform for data integration and correlation of progress / initiatives made by various ministries / bodies
- Create mobile applications for all utility based knowledge products, eg O&M/ SOPs/ online monitoring/ designing/ calculations/ audit procedures

Annexure 1: Programme Schedule

Organised by giz

Stakeholder Consultation Workshop on "Gap and Needs Analysis on Industrial Wastewater Management"

[Sustainable and Environment-friendly Industrial Production" (SEIP) – II project]

Date: 22nd November 2019
Venue: Tangerine Hall, Lemon Tree Hotel, Aerocity

Programme Schedule

Time	Agenda Point
09:30 –10:00 hrs	Registration Tea/Coffee
10:00 – 10:30 hrs	**Welcome and Short Introduction** by Mr. Raghu Babu Nukala, Project Director, GIZ-SEIP-II Project **Self-Introduction of Participants**
10:30 - 11:10 hrs	10:30 - 10:50 hrs: **Strengthening of Legal Framework – Output 1** **Presentation by Ernst & Young**
	10:50 – 11:10 hrs: **Questions and Answers / Discussion**
11:10 – 11:50 hrs	11:10 – 11:30 hrs: **Strengthening of Organisational Procedures & Processes – Output 2** **Presentation by Deloitte**
	11:30 – 11:50 hrs: **Questions and Answers / Discussion**
11:50 – 12:10 hrs	**Tea / Coffee Break**
12:10 – 12:50 hrs	12:10 – 12:30 hrs: **Strengthening of Incentive Mechanisms – Output 3** **Presentation by CRISIL**
	12:30 – 12:50 hrs: Questions and Answers / Discussion
12:50 – 14:00 hrs	**Lunch**
14:00 – 14:40 hrs	14:00 – 14:20 hrs: **Strengthening of Knowledge Products – Output 4 &** **Resource efficiency (RE) and sustainable consumption &production (SCP) - Output 5** **Presentation by NPC**
	14:20 – 14:40 hrs: Questions and Answers / Discussions
14:40 – 15:30 hrs	**Summarisation of the Needs**
15:30 – 16:15 hrs	**Concluding Session** • Presentation of Summary of Workshop Results by GIZ • Address by Dr. Prashant Gargava, Member Secretary, CPCB (tbc) • Address by Mr. Sundeep Singh, Scientist F, MoEFCC (tbc) • Concluding Remarks by Mr Raghu Babu Nukala, Project Director, GIZ-SEIP-II Project
16:15 – 17:00 hrs	**Tea/Coffee, Networking**

Annexure 2: Presentations made by consultants

OUTPUT 1

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

Stakeholder Consultation Workshop

Sustainable and Environment-friendly Industrial Production (SEIP) – II | 22.11.2019

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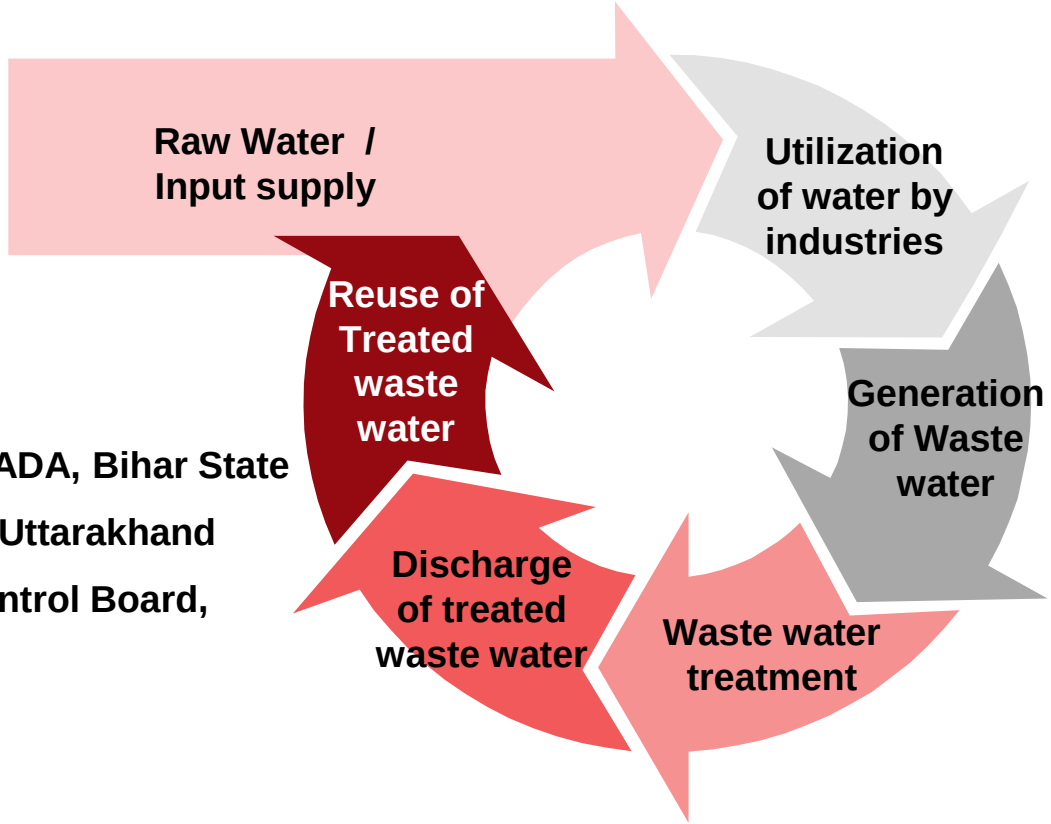
Contents

1. Methodology & Approach for Gaps & Needs Assessment
2. Feedback from Stakeholder meetings
3. Key gaps and Needs identified
4. List of Suggestions and Recommendations
5. Elaboration of priority recommendations supported by International case examples
6. Discussions

Methodology & Approach for Gaps & Needs Assessment

MAPPING OF STAKEHOLDERS

- Mapping of the Industrial waste water value chain
- Secondary research to identify various stakeholders across the value chain and their roles and responsibilities
- Consultation with GIZ, MOEF, CPCB, BIADA, Bihar State
- Pollution Control Board, SIDA, SIDCUL, Uttarakhand
- Environment Protection & Pollution Control Board, Industries, etc



Methodology used for Gaps & Needs Assessment.....1/2

1. Define the industrial water value chain i.e. from raw water supply to industries till the final discharge post treatment/re-use

2. Identification of dimensions/topics to be studied and investigated across each node of the value chain

3. Defining the components or heads under which the legal & regulatory framework for industrial waste water shall be analysed

4. Analyse whether at each node of the value chain, the four components comprising of the legal & regulatory framework are adequately covered in India

5. Identify gaps in legal and regulatory framework

Methodology used for Gaps & Needs Assessment.....2/2

Legal framework components

Industrial water value chain

Process Flow	Dimensions	Standards	Approval/Procedure	Reporting Structure	Monitoring
Raw Water Supply to Industry	Quality	Regulatory Instrument	Regulatory Instrument	Enforcement	Regulatory Instrument
	Quantity				
	Source				
Utilization of water by Industry	Technology				
	Process				
	Water Consumption				
Generation of waste water after industrial processes	Quality				
	Quantity				
	Technology				
Effluent Treatment	Quality				
	Technology		NA		
	Personnel/Skills			NA	
Discharge from CETP/ETP and re-use of water	Quantity				
	Quality				
	Type of re-use				

Absence of regulatory framework

Partial existence of regulatory framework

Regulatory framework exists.

Stakeholder Consultation

Workshop

Sr. No.	Workshop	Date
1	Stakeholder Workshop, Uttarakhand	22nd October 2019
2	Stakeholder Workshop to present the Gap Analysis/Need Analysis	1st November 2019

List of Stakeholders

Sr.No.	Contact Person	Organisation
1	Mr. Avinash Tripathi	Central Pollution Control Board
2	Mr. Subramanium	GIZ
3	Mr. D. P Mathuria	National Mission for Clean Ganga
4	Mr. Ajitabh	National Mission for Clean Ganga
5	Mr. Santosh Kumar Sinha	Bihar Industrial Development Authority
6	Mr. S.P. Roy	State Pollution Control Board, Bihar
7	Mr. Sumanpreet Singh	Confederation of Indian Industry
8	Mr. Harendra Garg	SIDCUL Manufacturers Association
9	Mr. S.P. Subudhi	State Pollution Control Board, Uttarakhand
10	Mr. S. S. Pal	State Pollution Control Board, Uttarakhand
11	Ms. Kirti Goyal	IIT Roorkee

Key Takeaways from Stakeholder Consultations

- Since there are no specific standards, monitoring process or approval for the re-use of waste water, it was suggested that in the future, re-use of waste water by the industry itself should be prioritized and zero liquid discharge should be attempted in a systematic manner

- In terms of discharge of waste water, there is a requirement of monitoring of each industrial unit to ensure compliance with discharge standards stipulated under the Environment Protection Rules, however there need to be a more stringent mechanism for the same.

- One of the major gap lies in the compliance of these by industry units and monitoring by the authorities and the same shall be enforced by purview of law.

- Apart from option of filing criminal cases or ordering closure, etc against a non complying industrial unit, other types of enforcement mechanism needs to be looked into and strengthened.

- Common repository and self- assessment tools are crucial in binding the industries to comply with the laws and rules as well as for the authorities for efficient monitoring and enforcement of the laws and rules.

Key Gaps Identified and Potential Interventions

Key Gaps: 1. Standards

Sub-Topic	Gap Identified	Potential Intervention	Rationale for Intervention
Raw Water Input	• No standards for quality and quantity of raw water to be used by the industrial units	Standards to be framed by the Central Government under the Environmental Protection Rules mandating industries comply with the raw water standards to be used for industrial processes.	Poor quality of Raw water increases demand for fresh clean water & thereby increases volume of discharge of waste water
Effluent Treatment by CETP/ETP	• No standard operating procedures which are in place so as to ensure that the discharge standards under EP Rules are fulfilled • No minimum standards prescribed for the personnel / skills for ETP & CETP operation	• Standard operating procedures for the CETPs, depending on the technology being used, ought to be notified by the Central Government under the Environment Protection Rules • Minimum qualifications and skill sets of the personnel operating the CETPs have to be notified under the Environment Protection Rules. Further, states should be allowed to make these standards more stringent, as may be required.	Optimal operation of ETP/CETP will enable better compliance to discharge standards
Re-use of Wastewater	• No standards defined for quality parameters for re-use of waste water by different industry types and uses (eg. Process and cleaning water, cooling towers, etc.)	Standards have to be notified by the Central Government under the Environment Protection Rules specifying the standards which wastewater must meet for various uses. Different standards to be prescribed for different end uses.	Use based standards for re-use of waste water will streamline the process of re-use and reduce discharge of waste water / demand for fresh water

Elaboration of Priority Interventions: 1. Standards

Recommendation	• **Standards have to be notified by the Central Government under the Environment Protection Rules specifying the standards which wastewater must meet for various uses. Different standards to be prescribed for different end uses.**
Instrument of Intervention	• **Rule making power of Central Government under Sections 6 and 25 of the Environment Protection Act, 1986**
Nodal Authority	• **Ministry of Environment and Forests (MoEF)**
Provision of Law	• **A new Schedule has to be inserted to the Environment Protection Rules specifying the standards that the wastewater has to adhere to for different end uses. Different standards for different end use i.e. industrial re-use, agricultural re-use, recreational re-use, etc.**

Key Gaps: 2. Self-Reporting

Sub-Topic	Gap Identified	Potential Intervention	Rationale for Intervention
Raw Water Input	No reporting mechanism mandating industrial unit to report the quality and quantity of raw water that they are drawing from any source, post obtaining of CTO.	Industrial units to mandatorily self report quality and quantity of raw water being drawn from any source one a monthly or quarterly basis to a government authority post obtaining a CTE and CTO. Self reporting to SPCB and in the medium term, via an online tool.	This will promote judicious use of water by the industry and hence excess wastewater generation will be deterred.
Utilisation of Water	No self reporting mechanism in place where the industrial unit has to report the type of technology / clean technology being utilized to achieve minimal water pollution	Industrial units to be obligated to report to the SPCB or any other prescribed authority, in a time bound manner, the type of technology being utilized in the industrial process, to achieve minimal water pollution.	Less water intense processes tend to generate less wastewater. This leads to the industry in consuming less of raw material i.e. water and treatment costs. Technology which conserves usage of water ought to be utilised by the industries.
Effluent Treatment by CETP/ETP	There is no provision for self reporting by the CETP operators stating the personnel that they have deployed for operating the CETP on a periodic basis.	CETP operators to periodically report to the SPCB the personnel which are being engaged by the CETP and whether such personnel are in compliance with the qualification and skill standards prescribed.	Efficient O&M will lead to reduction of costs of treatment of w/w
Incentivising Re-Use of Wastewater	There is no reporting mechanism for re-use of wastewater and therefore re-use can't be incentivized	A self reporting mechanism has to be notified whereby the re-use of wastewater can be quantified and incentivised	Incentivising re-use of waste water will reduce discharge and demand for fresh water

Elaboration of Priority Interventions: 2. Self- Reporting

Recommendation	• **Mandatory self reporting by the industrial units with respect to the gaps specified including but not limited to quantity and quality of raw water used, water utilisation by type, the type of personnel deployed by the CETPs, etc.**
Instrument of Intervention	• **Rule making power of Central Government under Sections 6 and 25 of the Environment Protection Act, 1986**
Nodal Authority	• **Ministry of Environment and Forests (MoEF)**
Provision of Law	• **By virtue of Sections 6 and 25 of the EP Act, the Central Govt may introduce a new Schedule to the Environment Protection Rules specifying the self reporting protocols that have to be adhered to by the industrial units including the frequency and the timeline within which such reporting has to be done**

Key Gaps: 3. Monitoring

Sub-Topic	Gap Identified	Potential Intervention	Rationale for Intervention
Raw Water Input	No monitoring mechanism mandating government instrumentality to monitor the quality of raw water being used on a periodic basis, post obtaining of CTE and CTO.	Mandatory and time bound monitoring by SPCB to check and ascertain the quality of raw water being used by the industrial unit	Good quality raw water will lead to reduction in pollution load on the w/w generated at the end of the process
Utilisation of Water	No provision allowing for periodic monitoring/audit by any government authority to ascertain whether the best available technology (BAT) prescribed for minimizing water pollution is being utilized by the industrial unit, in a periodic and time bound manner.	Periodic monitoring and audit by the SPCB or any other designated government instrumentality to ascertain whether the BAT prescribed for the industries is being adhered to.	Use of BAT will reduce w/w generation
Generation of water immediately post industrial process	No monitoring mechanism to check and ascertain whether the quality of industrial wastewater generated immediately after completion of the industrial processes, in a periodic and time bound manner.	Mandatory, periodic monitoring by the SPCB in a time bound manner to verify and check whether the quality of wastewater generated immediately after the completion of the industrial process and prior to effluent treatment	Stream segregation will reduce the load on the ETP units
Effluent Treatment by CETP/ETP	There is no monitoring mechanism in place wherein a government instrumentality shall be obligated to monitor and audit whether the CETP in question is fulfilling the minimum standards of personnel deployment as prescribed	Monitoring mechanism may be prescribed whereby the SPCB in coordination with officials from the state industrial development authority shall audit and monitor whether the CETPs are fulfilling the minimum qualification and skill standards prescribed for personnel at the CETP.	Good O&M will reduce operating cost of the CETP and efficient operations of the CETP will lead to reduction in pollutant load at the end of the treatment.
Re-Use of Wastewater	There is no monitoring mechanism in place whereby a government instrumentality would have to monitor and audit whether a re-user of wastewater is complying with the re-use standards prescribed while re-using wastewater	A binding monitoring mechanism may be prescribed whereby the SPCB shall in a time bound manner verify and audit whether the re-user of wastewater is complying with the re-use standards laid down. However, as the first step re-use standards would have to be laid down.	With precise reuse being mentioned in the CTE the unit will be bound to follow the terms and conditions and establish the relevant ETP process to meet with the recycling standards
Discharge of Wastewater	In terms of discharge, there is no mandatory provision stipulating periodic monitoring by a government instrumentality of the discharge being made by each industrial unit	While SPCB does have the monitor the discharge of wastewater by industrial units and ensure that discharge standards are being met, a periodic and time bound monitoring structure ought to be prescribed.	This will help SPCB staff understand the need and periodicity of monitoring reducing the load on the staff

Elaboration of Priority Interventions: 3. Monitoring

Recommendation	• **Mandatory and time bound monitoring by the SPCBs of the industrial units with respect to the gaps specified including but not limited to checking quality of raw water being used, whether CETP/ETP are deploying qualified personnel, whether re-user of wastewater is adhering to the re-use standards, etc.**
Instrument of Intervention	• **Rule making and amending power under Section 6 and 25 of the Environment Protection Act. In the medium and long term, online ICT tools may be considered for undertaking this monitoring.**
Nodal Authority	• **Ministry of Environment and Forests (MoEF)**
Provision of Law	• **By virtue of Section 6 and 25 of the EP Act, a new Schedule has to be inserted in the Environment Protection Rules which shall specify the various monitoring obligations. Schedule shall contain the indicative timelines for monitoring and the various heads under which monitoring shall take place. However, respective SPCB shall be have the discretion to prescribe more stringent timelines for monitoring.**

Key Gaps: 4. Enforcement

Sub-Topic	Gap Identified	Potential Intervention	Rationale for Intervention
Raw Water	There is an absence of a binding formula for Environmental Compensation for illegal extraction of groundwater and surface water.	While a formula for environmental compensation has been devised by CPCB under the directions of NGT, the same may be made mandatory through an official notification.	Irregular extraction of the water makes it a free commodity and hence the wastewater generation will be increased. Further, it also does not help SPCB understand the overall industrial balance in an estate / region
Discharge of Wastewater	There is an absence of a binding formula for levy of Environmental Compensation on the errant industrial unit for violating of the discharge standards laid down under the EP Rules	While a formula for environmental compensation has been devised by CPCB under the directions of NGT, the same may be made mandatory through an official notification.	In line with Polluter pays principle and will strengthen enforcement mechanisms
Discharge of Wastewater	Absence of empowering and enabling provisions enabling government authorities to take measures such as taking a bank guarantee from the industrial unit and encashment of the bank guarantee in case of failure to remedy any default.	Closure order to be issued under the Water Act for violation which can be revoked with a condition that a BG is to be submitted. Second violation will lead to forfeiting of the BG and revocation of the CTO	In line with Polluter pays principle and financial instrument will act as deterrent for the industry

Elaboration of Priority Interventions: 4. Enforcement

Recommendation	• **While a formula for environmental compensation for illegal extraction of groundwater and violation of discharge standards has been devised by CPCB under the directions of NGT, the same may be made mandatory through legal intervention.**
Instrument of Intervention	• **Power of delegation of the Central Government by way of notification in Official Gazette under Section 23 of the EP Act.**
Nodal Authority	• **Ministry of Environment and Forests (MoEF)**
Provision of Law	• **Using Section 23 of the EP Act, the Central Government may issue a notification empowering the CPCB to formulate relevant environmental compensation formula for illegal extraction of groundwater and violation of discharge norms and in turn empowering SPCB to levy such environmental compensation for errant cases.**

Key Gaps: 5. Reference Documents

Sub-Topic	Gap Identified	Potential Intervention	Rationale for Intervention
Raw Water	Currently there are no reference documents or guidelines issued by any government instrumentality prescribing the recommended methods for the purpose of pre-treatment of raw water	Reference documents/guidelines may be issued by the appropriate authority prescribing the recommended method for pre-treatment of raw water.	Raw Water quality control has direct implications on quantity of waste water being generated viz. if the TDS is raw water is high the TDS and quantity of wastewater generated at the end of the process tends to be high in TDS as well as volume.
Utilisation of Water	Currently there are no reference documents or guidelines issued by any government instrumentality providing an indicative best available technology which may be adopted when it comes to achieving ZLD or minimize water pollution from discharge of effluents	Reference documents/guidelines may be issued by the appropriate authority prescribing and recommending the best available technology that may be used for achieving ZLD/minimize water pollution from discharge of effluents.	Techniques like Waste Minimization can lead to less of water use and thus reduce the quantum of wastewater produced.
Effluent Treatment by CETP/ETP	Currently there are no reference documents or guidelines issued any govt. instrumentality prescribing the best available technology for ETP/ CETPs	Reference documents/guidelines may be issued by the appropriate authority prescribing and recommending the best available technology that may be used by the ETP/CETPs to minimize effluent discharge and water pollution.	Techniques like Waste Minimization can lead to less of water use and thus reduce the quantum of wastewater produced.
Self Assessment Tool	There is no tool which assess the need / applicability of CTE / CTO process		Enables industrial units undertake self assessment and increase compliance

Elaboration of Priority Interventions – 5. Reference Document

Recommendation	• **Reference documents may be issued by the Central Government recommending the recommended best available methods pre-treatment of raw water, best available technology which may be adopted when it comes to achieving ZLD or minimize water pollution from discharge of effluents and best technology which may be adopted by CETP/ETP.**
Instrument of Intervention	• **As per Section 3 (2) xiii of the Environment Protection Act the Central Government is empowered to issue manuals, codes and guides for abatement of environmental pollution**
Nodal Authority	• **Ministry of Environment and Forests (MoEF)**
Provision of Law	• **As per Section 3 (2) xiii of the Environment Protection Act the Central Government is empowered to issue manuals, codes and guides for control and abatement of environmental pollution. As per Section 23 of the Environment Protection, Central Govt may delegate any of its functions under the statute to any authority and hence CPCB may be delegated the power to formulate the reference documents and guidelines.**

Relevant International Case Studies

Benchmarks/ Country	Legal Instrument Used	Measures taken by benchmark country	Indicative Measures which may be taken in India
Canada (Province of British Columbia)	Enactment of statute- Water Sustainability Act, 2014	• Statute lays down the procedure for utilization of groundwater and surface water and the approvals to be taken • Provides for a monitoring mechanism for usage of the raw water.	▪ Consolidated regulation may be laid down by Govt of India specifying a process by which the permit for usage of water may be granted. ▪ A method for monitoring of usage of water may be laid down.
United States of America (Environment Protection Agency)	EPA Standards (empowered by Clean Water Act) - in the form of regulations	• Lays down inlet standards which are to be followed by publicly owned water treatment works (POTWs). • Also provides outlet standards for these POTWs.	▪ While inlet standards exist at central and state level, a monitoring mechanism to ensure adherence to such standards may be laid down by way of amendment to the EP Rules.
Spain (Royal Decree 1620/2007)	Enactment of statute- Royal Decree 1620/2007	• Lays down detailed 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.	▪ A separate statute OR rules may be laid down at the central level stipulating water quality standards depending on the type of re-use as well as the procedure for allowing re-use of water.
EU-LEX and WIPO (legal database tool) NETREGS (self assessment tool)	NA	• Legal database tools analysed lists down the laws as of date and captures the amendments on real time basis. • Self Assessment tool analysed provides for an interactive method by which industry operators can check the compliances which have to be adhered to.	• The Govt of India may consider floating a tender for procuring/using such ICT tools from relevant service providers.

THANK YOU

Output 2

OUTPUT 2 - Analysis of organizational structures, procedures and processes of public agencies at National & State level to effectively combat industrial wastewater pollution

Stakeholder Consultation Workshop

Sustainable and Environment-friendly Industrial Production (SEIP) – II | 22.11.2019

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by

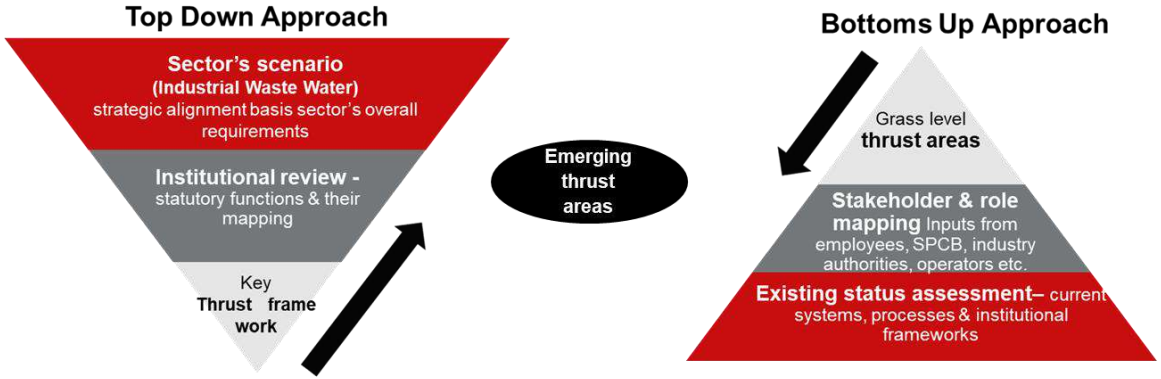
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Deloitte.

Structure of this session

- Methodology & Approach for Gaps & Needs Assessment
- Feedback from Stakeholder meetings
- Key gaps and Needs identified
- List of Suggestions and Recommendations
- Elaboration of priority recommendations supported by International case examples
- Discussions

Approach and methodology for our study



- **Secondary research** on programs & policies, review of annual reports, existing SOPs, Minutes of key meetings etc.
- **Primary stakeholder interaction** identifying & interacting with stakeholders – both public entities as well as related associations, and private players
- **Global case studies** to understand international best practices & their applicability in Indian context

Primary interaction with various stakeholders

	National	State	Industry Associations	Research Institutions	Private Sector
Stakeholders	• MOEFCC • CPCB • National Informatics Centre (NIC)	• DSIIDC • UEPPCB • SIIDCUL • SIDA	• FICCI • ASSOCHAM • CII	• CSE • IIT Roorkee • Development Alternatives • TERI	• CETP Operators • Industry Association • Select Industries
Nature of Consultation	• Functions • Structure • Processes • Programs • Policies	• Roles • Functions • Structure • Process	• Industry Guidelines • Pollution Monitoring • Knowledge Portals	• Industry Standards • Third Party Engagement in Pollution Monitoring	• CETP development/ operations issues • Pollution Equipment/ instrumentation

Meetings with CPCB on the Output 2 of SEIP II

Dates of Meetings:

1. 11.04.2019
2. 03.06.2019
3. 23.07.2019
4. 01.08.2019
5. 19.08.2019
6. 30.10.2019
7. 01.11.2019
8. 08.11.2019

GIZ Workshop with consultants

Date: 25.09.2019

3 Meetings with MoEFCC on the Output 2 of SEIP II

Date: 31.10.2019

Meetings with Ex. Advisor, MoEFCC on the Output 2

12 meetings between April-November 2019

Consultation Workshop on the Output 2 - Gaps

Date: 01.11.2019

6

Meeting with Ex. Deputy Commissioner, Industries, DSIIDC on the Output 2

Date: 05.11.2019






7 Meeting with Patparganj IA Management on the Output 2

Date: 05.11.2019

8 Meeting with DSIIDC on the Output 2

Date: 15.11.2019

9

Meeting with National Informatics Centre (NIC) on the Output 2

Date: 19.11.2019






10

Meeting with FICCI on the Output 2

Date: 15.11.2019

11

Meeting with CSE on the Output 2

Date: 19.11.2019

12 Meeting with Development Alternatives (DA) on the Output 2

Date: 20.11.2019

13

Meeting with SGR & EU Water Partnership Team on the Output 2

Date: 13.08.2019
Date: 19.10.2019

Feedback from stakeholder meetings

	Organization	Key Inputs
1	DSIIDC	• **Industry Inventorisation** • **Collaborations with TPAs** for monitoring/ compliance
2	FICCI	• **Tools/ Portals** on technology exchange with sustainable operations
3	NIC	• **Identify strategic partnerships** for national online portals/ systems for sustainable aspects
4	Centre for Science and Environment (CSE)	• **Partnerships** with international EPA to exchange knowledge
5	IIT Roorkee	• **Collaborations** with technical institutes on period review of standards • **Standardized** checklists and techniques for monitoring
6	Development Alternatives	• **Collaborations** for effective monitoring
7	CETP Operator	• **Market development** for pollution instruments • **Framework for CETP** development & operations
8	Workshop, DDN	• **Framework for Third Party Involvement** in monitoring/compliance • **Guidebook on reuse/recycle** to prepare state level action plan
9	ASSOCHAM	• **Tools/ Portals** for industry interactions and knowledge exchange

Key Gaps and Needs Identified

Our Scope based on ToR

Map **the statutory functions and roles** in the industrial wastewater context

Assess adequacy *of the following to* ***fulfill its functions & role objectives***

- **Procedures & Processes**
- **Organizational Structure**
- **Partnerships (Public/ Private)**

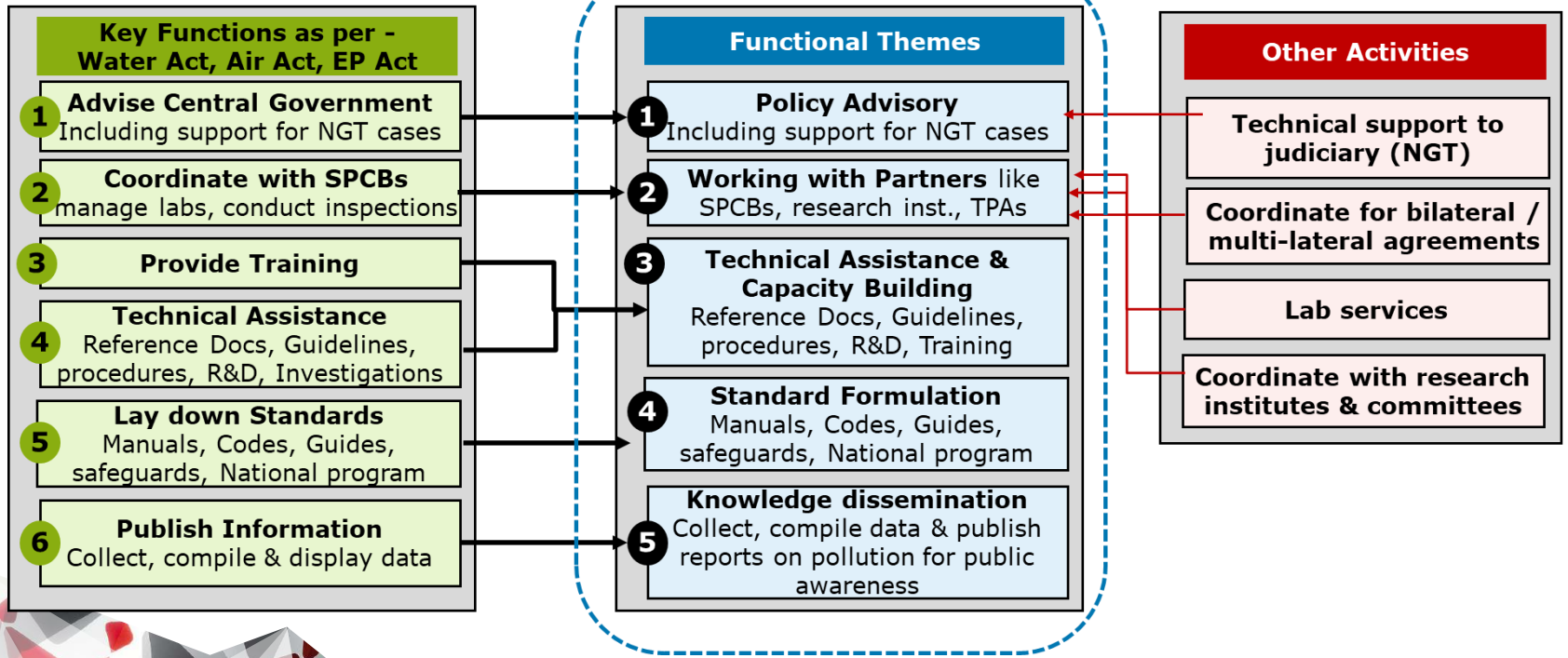
1) **Functional and role gaps** → based on statutory functions & inter-related roles of different agencies

2) **Organization structure & staff alignment** → based on staff alignment for performing industrial wastewater works

3) **Process & partnership gaps** → based on performance along industrial wastewater value chain, for achieving overall CPCB's objective

Key Gaps and Needs Identified – (1) Functional and role gaps

CPCB high level functional themes based on Act mandates – to understand the statutory roles



Key Gaps and Needs Identified – (1) Functional and role focus

Inter-related roles of CPCB with that of MoEFCC & SPCB – for key focus areas

Key Functions	MOEFCC	CPCB	SPCB
Standard Formulation	**Notify standards** after due diligence	Develops **MINAS** technically & economically feasible standards and norms.	Enforces **MINAS** & provides feedback to CPCB Develop **stringent standards**
Development of Industries (Permits)	**Environmental clearance** reqd.	Tech. assistance to MoEFCC	**Consent** to Establish (CTE) and Consent to Operate after **inspection**
Monitoring & Enforcement	**Online Consent Monitoring** & mgmt. System (OCMMS)	**Guidelines** for helping SPCBs **Monitor with OCEMS** - HPIs/ GPIs(Ganga)/CETP	**Periodic inspection** of industries
Legal Action – NGT order		**CPCB party for inspections & Action Plan**	**SPCB joint party in inspections** & Action Plan Preparation

Additional works

Limited focus

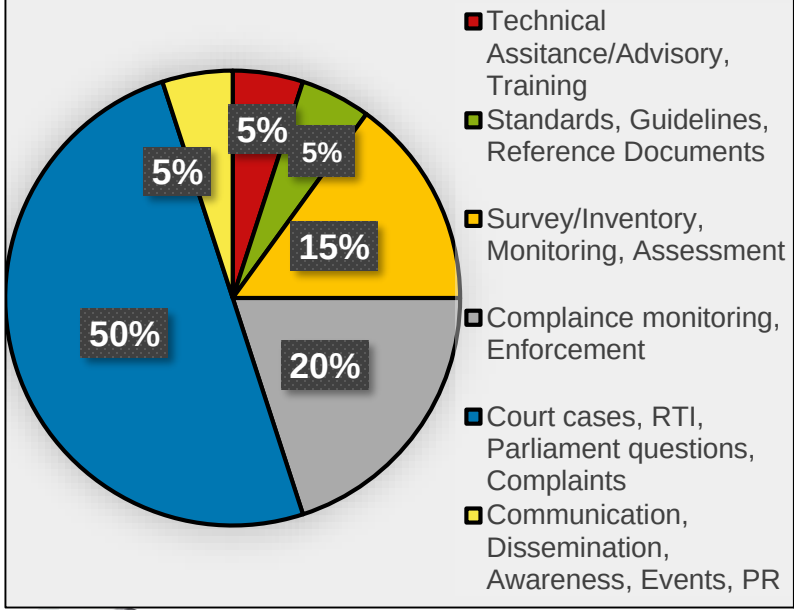
Key Concerns

- **Increasing NGT orders** to CPCB, & thus the work load
- **SPCBs** with its limited staff is focused on consent to establish/operate and complaint management – with **limited focus on** standard formulation and limited monitoring coverage
- **MoEFCC** gets several notifications from industry on specific concerns, to which CPCB **supports by providing technical inputs**

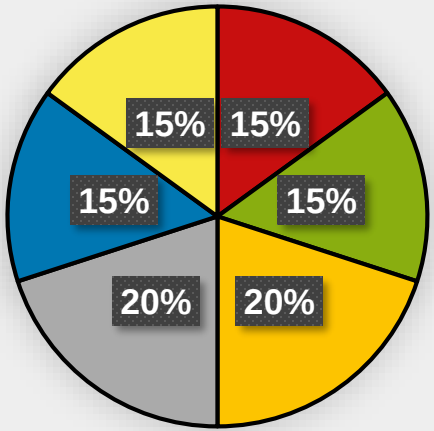
Key Gaps and Needs Identified – (1) Functional and role focus

Present focus of CPCB for performing these various functions and roles

Existing Focus



Envisaged Focus



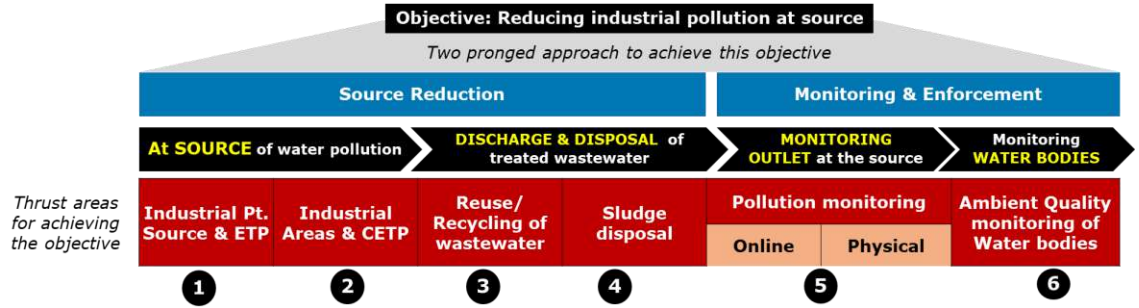
Key Concerns

- ❑ **Increasing NGT orders** to CPCB, & thus the work load
- ❑ More **focus on monitoring & enforcement activities** which are rather the core functions of SPCB
- ❑ **Limited focus on core functions** such as Technical Assistance, standard formulation & knowledge management

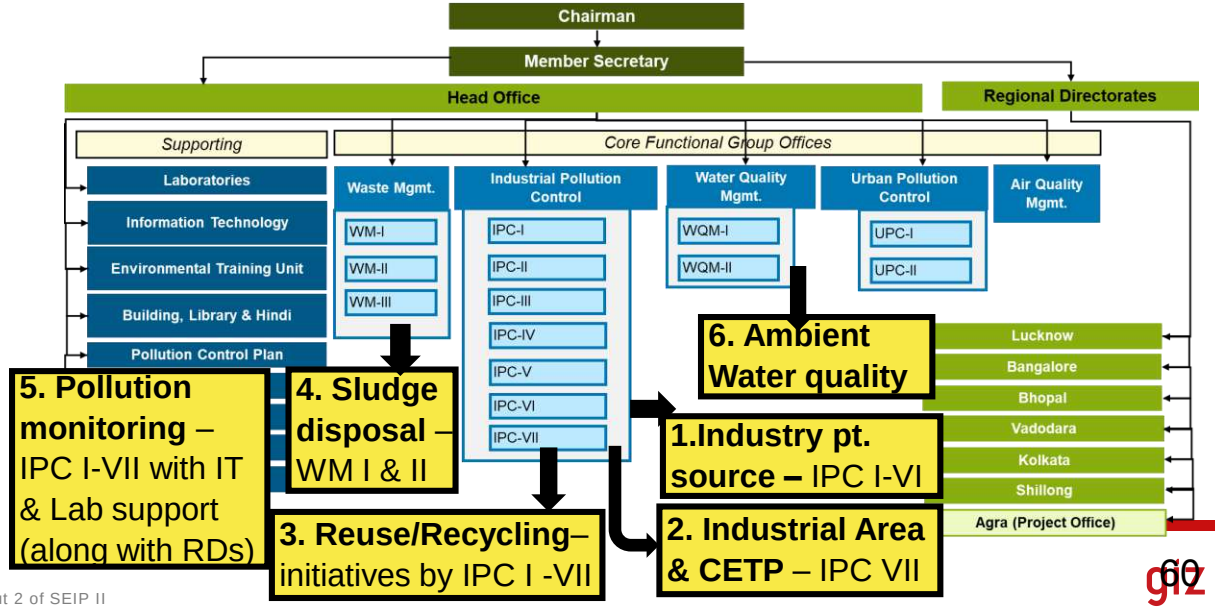
This is the indication of the estimated distribution of time spent by technical scientists at CPCB. This is however not based on a detail work study but more representation based on anecdotal discussions with select CPCB officials

Key Gaps and Needs Identified – (2) Organisation Structure

(A) Mapping the value chain of industrial wastewater – to understand the various works to be done by CPCB in this context

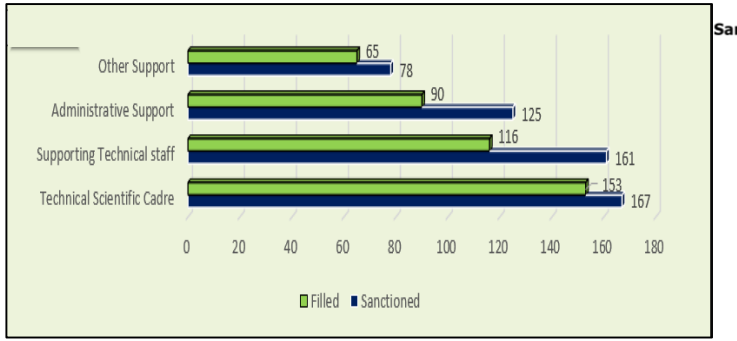
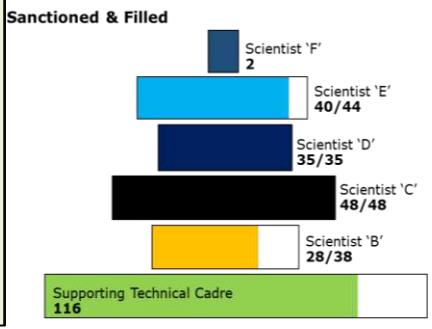
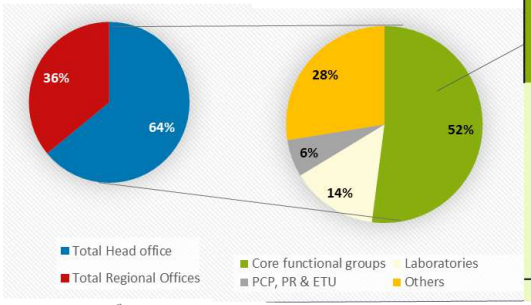


(B) Understanding the various divisions performing the roles identified in value chain



Key Gaps and Needs Identified – (2) Org. Structure

(C) Staff alignment along these divisions, to perform various functions

Area	*Rationale*	*Emerging gap*
Nature of staff and their availability	 	▪ Only 36% of staff are among the scientific cadre officers ▪ Among scientists, more Sc. 'E' officers than Sc. 'B' – ***possibly affecting work allocation***
Distribution of scientific cadre officers		▪ 1/3rd of total scientists aligned on core divisions ▪ With just ~3 scientists per division, **most time spent on NGT & Ministry support**

Core Functional Groups	No. of scientists
Industrial Pollution Control (IPC)	21
Urban Pollution Control (UPC)	8
Waste Management (WM)	10
Air Quality Management (AQM)	4
Water Quality Management (WQM)	8
Total	51

Sub-divisions	No. of scientists
IPC - I	3
IPC - II	4
IPC -III	4
IPC- IV	2
IPC- V	3
IPC- VI	3
IPC- VII	3

CPCB‘s evolving role and its institutional implications

Before proceeding to process gaps, its important to understand the evolving role of CPCB and its expected institutional implications

KEY THEMES

Growing **number of industries** and associated **volume of work**

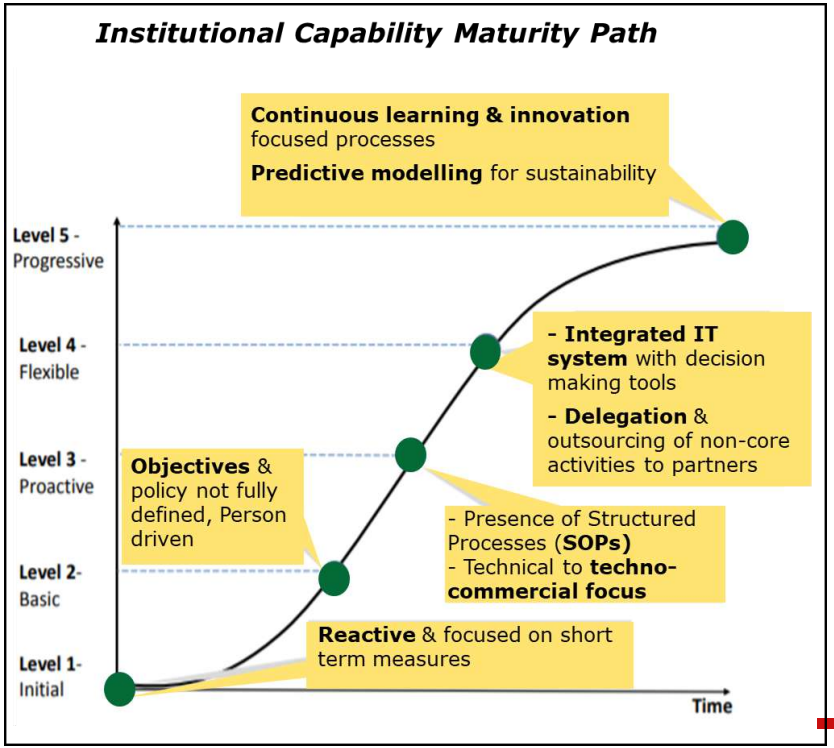
+

Limited staff

Focus on Strengthening Partnerships – Research/ academic Institutes, Labs etc.

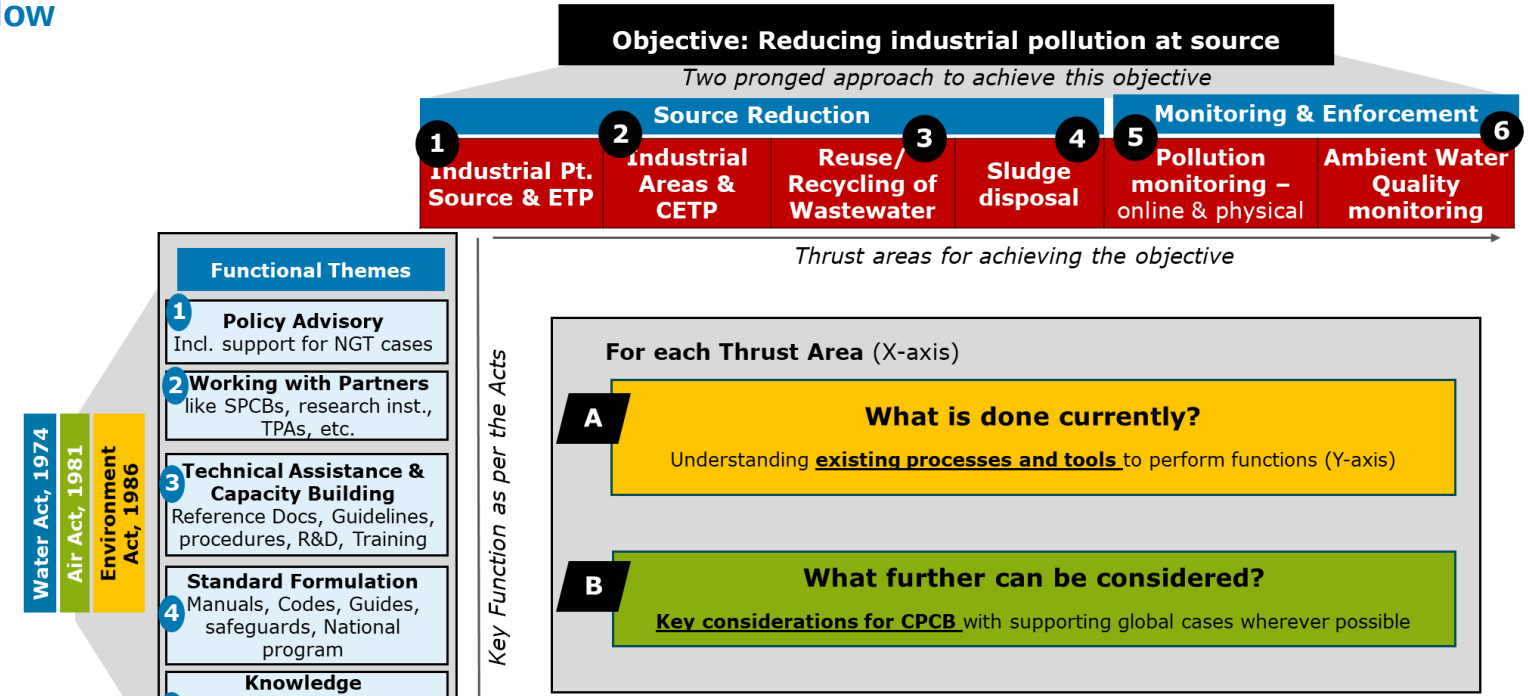
Leveraging IT Tools to support monitoring, compliance and enforcement

Strategic Outsourcing – such as Third Party Audit Agencies



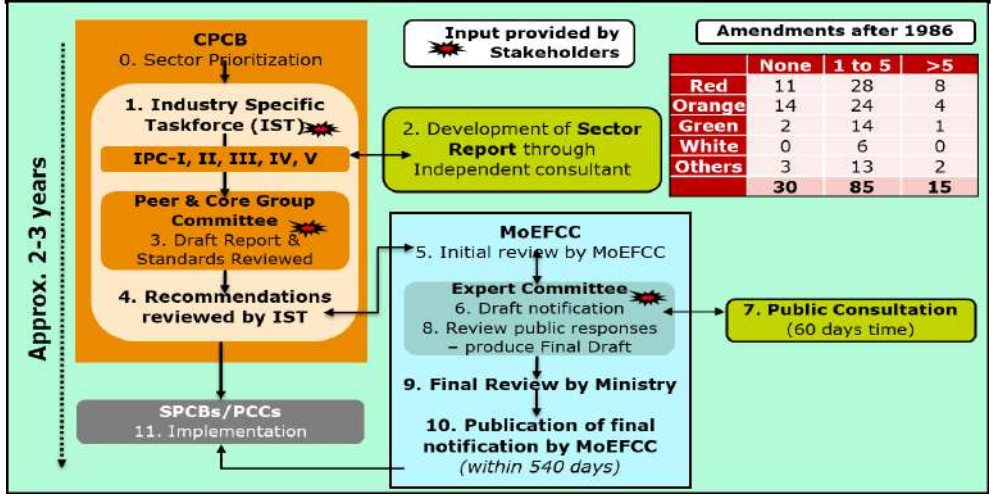
Key Gaps and Needs Identified – (3) Process gaps

Our approach for identifying process gaps, mapped the existing functions along value chain as below



1A. What is done currently?

CPCB/SPCB sets effluent standards



CPCB established industry categorization criteria

- **Lack of uniformity** among SPCBs in categorization till 2009
- **CPCB with SPCB reps** developed classification
- In 2016, CPCB re-classified with **Pollution Index**

Category	PI score	Consent Validity	Total
Red	>=60	5 yrs	60
Orange	41-59	10 yrs	83
Green	21-40	15 yrs	63
White	<=20	NA	36

Functional Themes	Current Activities/ Focus Areas
1 **Policy Advisory**	Industry categorization criteria established
2 **Working with Partners** like SPCBs, technical research institutes, TPAs	Formulation of working groups comprises of SPCB reps., industry experts
3 **Technical Assistance & Capacity Building** BREFs, Guidelines, procedures, R&D, Training	COINDS developed with help of research bodies
4 **Standard Formulation** Manuals, Codes, Guides, safeguards, Nat'l program	Industry specific effluent & emission standards; guidelines for industry categorization
5 **Knowledge dissemination** Collect/compile data & publish reports	Effluent data collection for 17 HPIs & GPIs (along River Ganga)

1B. What further can be considered?

Key Intervention Areas	1 Periodic review of technical standards	2 Uniform Code & Online tool to publish industry data	3 Guidelines to SPCBs on providing consent
Indicative Activities/ Tasks	1) ***Defined Program Plan for Developing Standards*** – every 3 years rolling plan, for subsequent years revision of standards & new standards 2) ***Prepare & Publish Sector Reports (like COINDS)–*** for next year's sector → cases, BAT, techno-commercials, etc. 3) ***Industry comments*** on draft technical standards (i) online – 30-days window, (ii) one day workshop	1) ***Obtain List of Industries*** with NIC code annually from MoSPI – Annual Survey of Industries (ASI); 2) ***Link NIC code to CPCB categorization*** and industry inventory; 3) **Link** industry consent and category data ***from SPCB to online portal;*** 4) ***Develop online monitoring and alert system*** *to track* consent and renewal status	1) ***Site-specific factors*** for computing composite pollution index score of each industry 2) ***Standard Documents for*** application of consent, checklist for issuing consent and status report of industry

High priority | Good to have

Key Gaps and Needs Identified – (3) Process gaps

Select key process gaps identified for each element in the value chain is summarized below

	Thrust area	Key activities done by CPCB	Potential improvement areas
1	**Industrial pt. source & ETP**	• MINAS developed for each industry • Industry categorization basis pollution index	• Periodic review of standards – rolling plan • Industry inventory – linking NIC code & MoSPI data
2	**Industrial areas & CETP**	• Assessing PIAs through CEPI score • Tech. inputs to MoEFCC on CETP's EC process • Qly. monitoring of CETP operations (OCEMS)	• Assess CEPI for all PIAs & not just 100, periodically • Guidelines for developing & managing CETPs, to mitigate high future failure risks
3	**Reuse/ recycling of industrial ww**	• Industry specific charters along river Ganga • Reactive measures after NGT order	• Quality stds. for various use of treated industrial WW • Legal & process framework for enabling reuse
4	**Sludge disposal**	• "Registration" valid for 5 years for operators • Develops tech. guidelines, SOPs & HAZWAMS	• Implementation guidelines for sludge management with pricing, trading and business models
5	**Pollution monitoring at industries**	• Real-time monitoring for 17 HPIs/GPI/CETPs • SMS alerts for undertaking physical inspection • Physical inspection, post NGT, supported by ROs	• Pollution Audit policy for involving TPAs • Tool for integrated industry monitoring – allowing self-assessment reports, and data processing
6	**Ambient Water quality monitoring**	• 4000+ stations (physical)– rivers, lakes & GW • 36 RTM stations along Ganga • Identify polluted stretches & develop action plan	• Water portal for all water quality data & auto assessment of polluted stretches • Guidelines for SPCBs to install monitoring stations

List of Suggestions and Recommendations

Objective: CPCB's **structure, processes & tools** strengthened for better industrial water management

Type		Suggestions	Outcome	Impact	Examples
Tools / System interventions	1	**Integrated Industry Portal**, NIC code	Linked NIC code, ASI data - inventory of all industries in one portal	**All IPC divisions**, saves time	**USEPA** using NAICS code
Process Interventions	2	Strategic outsourcing to TPAs - **Pollution Audit Policy**	Guidebook for deploying & empaneling TPAs, payment strategy, etc.	**All IPC divisions**, saves time & better efficiency	**GPCB**, **USEPA** with LIMS
	3	Framework for **reuse & recycling** of industrial wastewater	Quality standards, legal framework & guidelines – pricing, trading models	**All SPCBs**, enables adoption	**Israel & Singapore's** national policies
	4	Guidelines for developing & managing **Env. infrastructure**	CETP development & sludge disposal – technology, business model, competency, etc.	**IPC VII**, proactive measure for future, efficient practices of **states**	**USEPA & Australia** for managing operators
Structural interventions	5	**Realigning IPC division** with functional focus	(1) Standard formulation (Sectoral alignment), (2) Monitoring (area) (3) Tech. & Financial Assistance	**Staff of all IPC**, better staffing & management of resources	**USEPA's** org structure

Recommendations – Process Related

Priority recommendation 1 Integrated Industry Portal

Objective & Scope

- a **one-stop portal**, displaying consent status, category, pollution levels, & monitoring report
- Linking **NIC code** to CPCB categories, integrating annual **survey of industries** data
- **Reports using filters** - Location, Pollutant parameters, SPCBs, Industry by name, NIC code, industry category/type, and Time

Benefits

- **Saves SPCB's time** as all industries are categorized
- With geo-tagged industry data, **efficiency of monitoring & inspection** can improve
- **Avoids duplication** of efforts by MoSPI, SPCB & CPCB independently
- Better **compliance assessment** with one stop portal & meaningful reports/ maps

How to implement in CPCB context?

IPC-VI is already looking after industry categorization and on-line installations → following additional works

(1) **Categorizing industries** in NIC code basis PI

Repetitive work

(2) **Developing & establishing** the Integrated Industry portal

One-time activity

(3) **managing operations** of portal with the help of IT division (*presently looking after data from the OCEMS portal)*

Continuous activity

However, IPC-VI has only **3 scientist staff**

Adopting a 3-tier structure in line with EU's BAT approach

IPC VI (M&C)

Appoint a TWG

Appoint Developers

Priority recommendation 1 Integrated Industry Portal

Role of stakeholders	Developers	TWG	Authority
	• Develop portal architecture – key users, data pts & outputs • Digitizing data & linking basis TWG feedback • Develop the integrarated portal as per agreed scope & architecture • Prepare user manual	• Appoints "Developers" • Review & finalize the portal & its architecture • Prepares & chairs TWG meetings • Enable coordination • Provide data as required	• Categorization of Industries basis NIC codes • Appoints TWG & ensures compliance to timelines • Orientation & training of TWG/ Developers • Knoweldge sharing sessions • Publish finalized portal
Timeline	**One-time** → Develop the portal & handover operations in **a year**	**One-yr only** → Bi-weekly TWG meetings to monitor progress	**For 1 yr** → Monthly TWG meetings to track progress **Bi-annual review** of industry categories
Staff / skills	• Data entry operators – 2-3 nos. for digitizing data • Industry & Environment experts – 2 nos. to translate business needs into IT requirements • Application Developers – 3-5 exp. software professionals	• CPCB – from both IPC divisions, & IT (3 nos.) • SPCB – select SPCB memebrs – 5-7 nos. • Industry experts – 6-10 nos	• 2-3 member group headed by the divisional head of IPC-VI – supported by external research bodies such as IIT for categorization of industries
How?	External consultants through a competitive bid	15 member group vide CPCB issued order	Headed by IPC-VI, supported by IT division

Priority recommendation 2 Pollution Audit Policy Guidebook

Objective & Scope

- **Guidelines & framework** for involving TPAs to monitor compliance of industries to standards
- Enabling **legal framework** for deployment & empanelment of TPAs
- Process & system for **random assignment of TPAs** & payment from a common fund
- **Competency framework** – for TPAs basis activity & industry type/ size, etc.

Benefits

- **Saves time & improves physical monitoring efficiency** by automated prioritization basis TPA reports
- Better **compliance assessment** as TPAs can generate reliable quarterly reports

How to implement in CPCB context?

IPC collectively is already looking after online & physical monitoring→ following additional works envisaged

(1) **Developing** & establishing Audit Policy guidebook

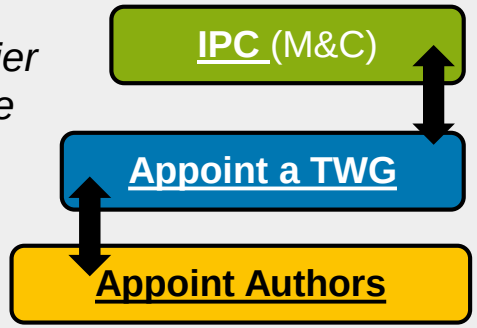
One-time activity

(2) **managing operations** through TPA reports with help of legal & planning divisions as well

Continuous activity

However, IPC has only **22 scientist staff**

Adopting a 3-tier structure in line with EU's BAT approach



Priority recommendation 2 Pollution Audit Policy Guidebook

	Authors	TWG	Authority
Role of stakeholders	• Develop the key aspects to be covered in the guidebook • Develop competency framework linked with various categories of the industries for monitoring • Develop mechanism for creation of state level fund and payments etc.	• Appoints “Authors“ • Review & finalize the guidebook contents • Prepares & chairs the TWG meetings • Enable coordination with other stakeholders • Provide data as required • Review the guidebook	• Appoints TWGs & ensures development as per agreed timelines • Orientation & training the TWG/ Developers • Internal knoweldge sharing sessions • Publish the finalized guidebool online • Interact with industries
Timeline	**One-time** → Develop the guidebook as per agreed format within **8 months**	**One-yr only** → Bi-weekly TWG meetings to monitor progress	**For 1 yr** → Monthly TWG meetings to track progress **Quarterly review** of TPA reports
Staff / skills	• Technical experts –2 members for drafting SOPs of the TPAs, • Commercial experts– 4 members, for assessing business models, pricing & competency framework • Legal expert – 1 nos. – for legal framework	• CPCB – from IPC divisions(3 nos.) • SPCB – select SPCB members – 5-7 nos. • Industry experts – 3-4 nos. • Research bodies – 3-4 members	• 2-3 member group headed by the divisional head of one of IPC I-V – supported by legal expert & planning head
How?	External consultants through a competitive bid	15 member group vide CPCB issued order	Headed by IPC, support by legal & planning

Priority recommendation 3 Policy guide on reuse & recycling of treated industrial wastewater

Objective & Scope

- A **step-by-step policy guide covering all aspects of reuse and recycling of treated wastewater** that can be developed with multi-users and accessed by multiple beneficiaries for taking actions on improved water quality management.
- **Technical Factors evaluation** – local site specific factors, technological treatment options, quality, etc.
- **Commercial Factors evaluation** – trading options and water pricing in the region
- **Techno-commercial prioritization framework** for choosing – reuse/ recycling / ZLD options.

Benefits

- **Saves time & avoids duplication** of efforts by different SPCBs
- Better compliance to reuse mandates, with calculated feasibility and also sufficient checks for monitoring
- Reduced water demand and costs

How to implement in CPCB context?

IPC-VI looking after the general guidelines for other sectors, seems to be more suitable for undertaking these works→ following additional works envisaged

(1) **Developing & establishing** the Reuse & recycling guidebook→

One-time activity

(2) **Updating quality standards** with help of **IPC I-V division** as well→

Repetitive activity

However, IPC-VI has only 3 scientist cadre staff

Adopting a 3-tier structure in line with EU's BAT approach

Steering Committee by IPC-VI division / T&F Assistance

Appoint a TWG

Appointing a consultant for developing the Policy guide

Priority recommendation 3 Policy guide on reuse & recycling of treated industrial wastewater

Role of stakeholders	Authors	TWG	Authority
	• Develop the key aspects to be covered in the guidebook as per agreed scope & structure • Priority framework with technical options to be considered, • Assess financial considerations such as tarrif, trading, etc..	• Appoints “Authors“ • Review & finalize the guidebook contents • Prepares & chairs the TWG meetings • Enable coordination with other stakeholders • Provide data as required • Review the guidebook	• Appoints TWGs & ensures development as per agreed timelines • Orientation & training the TWG/ Authors • Internal knoweldge sharing sessions • Publish the finalized guidebool online • Interact with industries
Timeline	**One-time** → Develop the guidebook as per agreed format within **one year**	**One-yr only** → Bi-weekly TWG meetings to monitor progress	**For 1 yr** → Monthly TWG meetings to track progress **Annual review** of re-use standards
Staff / skills	• Technical experts –4 nos. for asssesing quality standard of different reuse options, • Commercial experts– 3 nos., for assessing models, pricing and trading strategies • Institutional expert – 1 nos. – for assessing institutional	• CPCB – from IPC divisions(3 nos.) • SPCB – select SPCB members – 5-7 nos. • Industry experts – 6-10 nos. • Research experts – 5-6 members from CPPRI, etc.	• 2-3 member group headed by the divisional head of one of IPC VI – supported by a representative from IIT
How?	External consultants through a competitive bid	15 member group vide CPCB issued order	Headed by IPC, support by research body

Priority recommendation 4 Guidebook for development and management of Environmental Infrastructure

Objective & Scope

- **One place for all operator related guidelines** that can be used for effective development and operations of any infrastructure service
- **Potential Technological options** for CETP & its costs, updated using CETP BREFs every 2-3 years
- **Possible Business Models** for CETP development, operation and maintenance
- **Commercial and Institutional options** for each business model, with clear role of stakeholders
- **Techno-commercial feasibility** guidelines
- **Operator Competency Framework** with clear SOPs for selecting CETP operator – min. qualification criteria factoring complexity, technology, business model, etc.
- **Model contract agreement** with its key clauses for different business models

Benefits

- **Better control over development and operations of CETP**, thereby avoiding the future failure of operators.
- **Guide for all state industry development bodies**, to aid in their transaction of environmental infrastructure works.

How to implement in CPCB context?

IPC - VII which is looking after CETP related works→ following additional works envisaged

(1) Developing & establishing the Guidebook→

One-time activity

However, IPC-VII has only 3 scientist cadre staff

Adopting a 3-tier structure in line with EU's BAT approach

IPC-VII division / T&F Assistance

Appoint a TWG

Appointing a consultant for developing the Guidebook

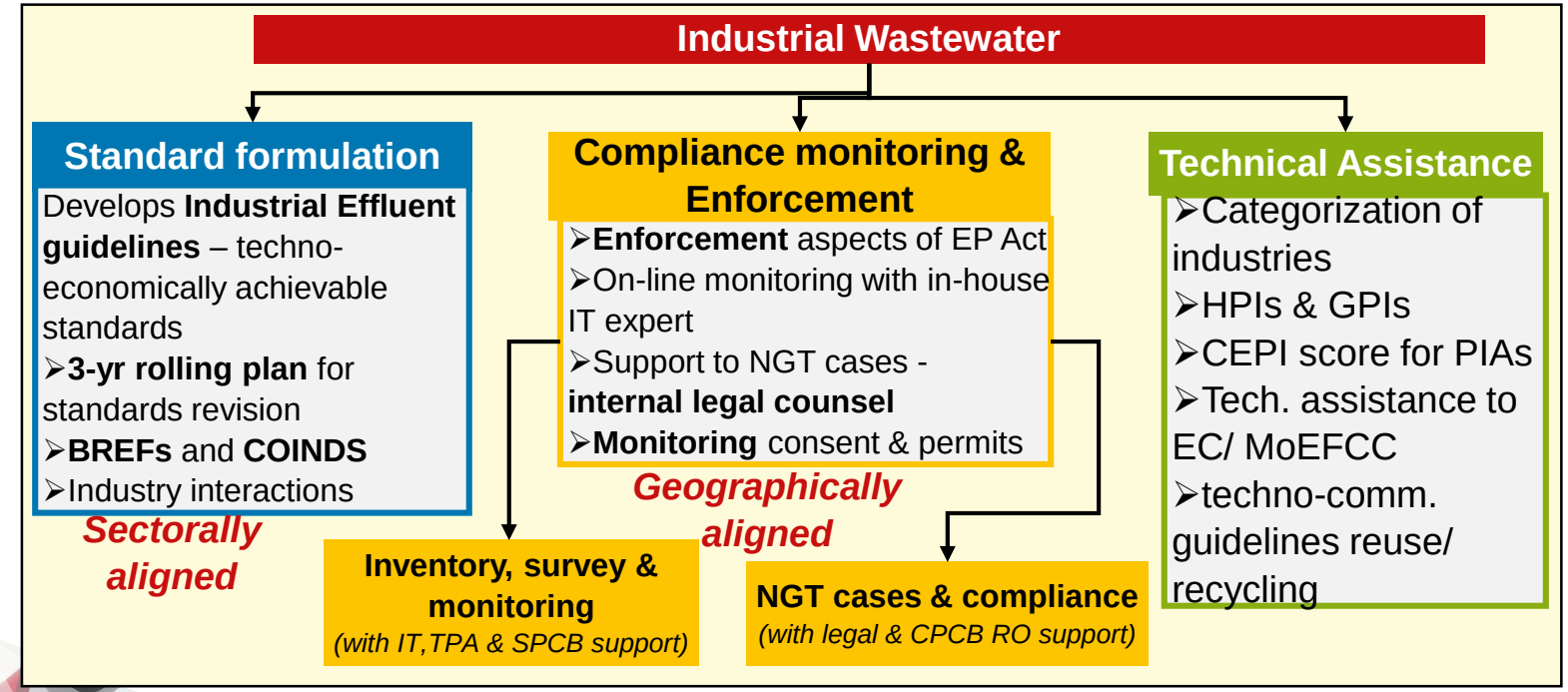
Priority recommendation 4 Guidebook for development and management of Environmental Infrastructure

	Authors	TWG	Authority
Role of stakeholders	• Develop the key aspects to be covered in the guidebook as per agreed scope & structure • Priority framework with technical options to be considered, • Assess financial considerations sucha as tariif, trading, etc.	• Appoints “Authors“ • Review & finalize the guidebook contents • Prepares & chairs the TWG meetings • Enable coordination with other stakeholders • Provide data as required	• Appoints TWGs & ensures development as per agreed timelines • Orientation & training the TWG/ Authors • Internal knoweldge sharing sessions • Publish the finalized guideboolk • Interact with industries
Timeline	**One-time** → Develop the guidebook as per agreed format within one year	**One-yr only** → Bi-weekly TWG meetings to monitor progress	**For 1 yr** → Monthly TWG meetings to track progress
Staff / skills	• Technical experts –3 nos. for assessing technological options, and costs associated and expected operator skills for different systems • Commercial & transaction experts– 5 nos., for assessing business models, pricing, and developing bid document	• CPCB – from IPC divisions (3 nos.) • SPCB – select SPCB members – 3-4 nos. • CETP operators – 3- 4 nos. • Research experts – 2-3 members from IIT etc. • IDC/ IDA reps – 3-4 nos.	• 2-3 member group headed by the divisional head of IPC VII – supported by a representative from IIT
How?	External consultants through a competitive bid	15 member group vide CPCB issued order	Headed by IPC, support by research body

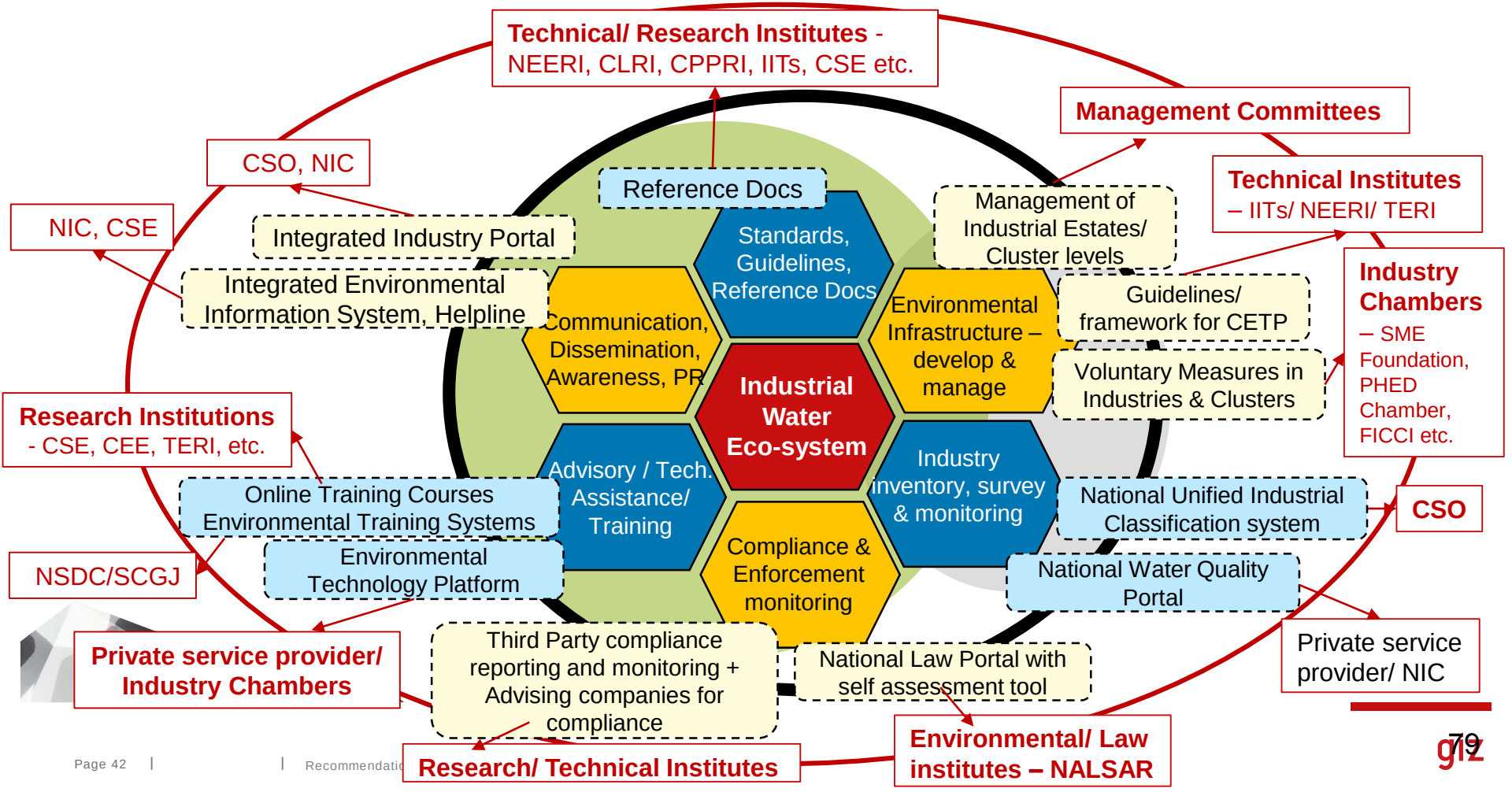
Recommendations – Structure Related

Suggestions for improving the Org. Structure of CPCB

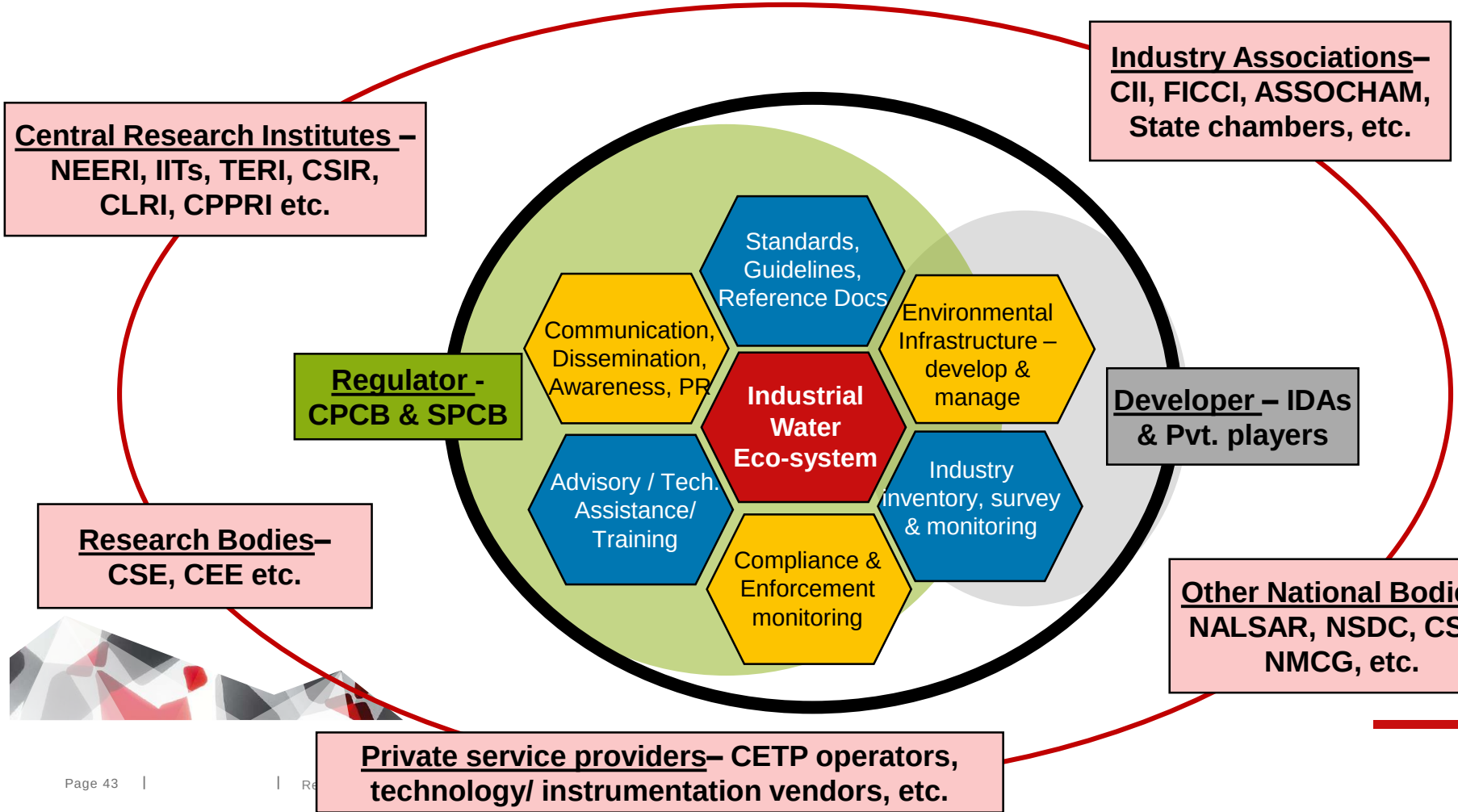
How can the **staffing within Industrial Pollution Control** be realigned to a **functional oriented structure with clear ownership**



Establishing Industrial Wastewater eco-system of various agencies



Establishing Industrial Wastewater eco-system of various agencies



Thank You

Stakeholder Consultation Workshop

Sustainable and Environment-friendly Industrial Production (SEIP) – II | 22.11.2019

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Deloitte.

Output 3

Baseline analysis of existing incentive mechanisms for industrial wastewater management to effectively combat environmental pollution

Stakeholder Consultation Workshop

Sustainable and Environment-friendly Industrial Production (SEIP) – II | 22.11.2019

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Infrastructure Advisory

CRISIL
An S&P Global Company

Discussion outline

1. Approach and Methodology for assessing gaps in incentive framework
2. Feedback from Stakeholders
3. Key gaps and Needs identified
4. List of Suggestions and Recommendations
5. Elaboration of priority recommendations supported by International case examples
6. Discussions

1. Approach and methodology for assessing gaps in the existing incentive framework

Methodology & Approach for Gaps & Needs Assessment

Baseline / Inception

- Institutional stakeholder map;
- SEIP II program;
- Broad menu of options of incentive mechanisms;
- Existing incentive mechanisms;
- Case studies on potential best practices / new mechanisms.

Gap assessment

- Review of existing incentive mechanisms and potential changes; Mapping the gaps in existing incentive framework;
- Preliminary screening of the other potential incentives that can be applied;
- Shortlist of additional incentive mechanisms for detailed assessment;
- Stakeholder consultations.

Recommendations

- Detailing and profiling the additional / new incentives;
- Detailing and profiling the changes to existing incentive mechanisms;
- Prerequisites for implementation of the proposed incentives
  - Institutional
  - Legal / regulatory
  - Monitoring / enforcement

Stakeholder Perspectives

- Government (Nat. / State)
- Service providers
- Industry associations
- CETP operators

+

- Past incentive mechanisms
- International Case studies

Key stakeholders

	Government	Government / Parastatals / Autonomous	Private sector
National	• MOEFCC • Ministry of MSME • Ministry of Textile • Ministry of Steel • DPIIT	• Central Pollution Control Board (CPCB) • National Green Tribunal • National Mission for Clean Ganga • National River Conservation Directorate • Bureau of Industrial Standards	• Various Industry associations • Developers / technology advisors – Ion Exchange India, VA Tech Wabag, Ramky etc. • Civil society (CSE India, MSME foundation)
State	• Department of Industries • Department of Environment and Forests	• Uttarakhand Environment Protection & Pollution Control Board (UEPPCB) • State Industrial and Infrastructure Development Corporation (Uttarakhand) Limited (SIIDCUL) • State Industrial Development Authority (SIDA) • Directorate of Industries • State Ganga Committee • State Project Monitoring Group	• SIIDCUL Manufacturers Association of Uttarakhand (SMAU) • SIIDCUL Entrepreneurs Welfare Association (SEWA) • SIIDCUL Industrial Association (SIA) • Association of Pharma Manufacturers (APM) • Local Chapter of PHD Chamber • Local Chapter of ASSOCHAM
Local	-	• Regional Offices, UEPPCB • Regional Offices, SIIDCUL • District Ganga Committee • District Industries Center	• SK UEM Water Projects (CETP Operator) • Industrial estate-specific associations

Existing incentive mechanisms – Capital subsidy schemes

No.	Existing scheme	Incentive	Aspect of industrial wastewater incentivized	Beneficiary of the incentive
1	CETP Scheme	Capital subsidy of up to 75%	• Construction of CETP/ ZLD	MSE industries
2	IPDS	Capital subsidy of up to 75%	• Construction of CETP/ ZLD	Textile industries
3	MSE-CDP	Capital subsidy of 70%-80%	• Construction of ETP	MSME industries
		Capital subsidy of 60%-70%	• Construction of allied infrastructure	State government agency
4	Modified IIUS	Capital subsidy of 75%	• Construction of CETP/ ZLD	State government agency
		Capital subsidy of 50%	• Construction of allied infrastructure	State government agency
5	CLCSS	Capital subsidy of 15%	• Construction of CETP	MSME industries
6	ILDP	Capital subsidy of 70%	• Construction of CETP/ ZLD and allied infrastructure	Leather industries
7	MIIP (Uk)	Capital subsidy of 30%	• Construction of ETP	Large industries
8	HIIEP (Uk)	Capital subsidy of 30%	• Construction of ETP	Large industries
9	Clean Technology	Capital subsidy of 75%	• Adoption of clean technology	SMEs

Existing incentive mechanisms – Recognition schemes

No.	Existing scheme	Incentive	Aspect of industrial wastewater incentivized	Beneficiary of the incentive
9	ZED certification	Recognition in the form of graded ratings 80%, 60% and 50% for micro, small and medium enterprises respectively for rating and hand-holding assistance 25% concession in loan processing charges at SBI and Yes Bank for gold or higher rating 0.25% reduction in interest on loans from SBI for diamond and platinum rated MSMEs	• Implementing systems for waste reduction, pollution control and maintenance of pollution control equipment • Achieving outcomes in terms of resource efficiency and pollution control	MSME industries
10	Eco-mark	License for use of Eco mark logo on products	• Compliance with effluent standards	Consumer product manufacturing industries
11	Responsible Care	License for use of Responsible Care logo	• Comprehensive management of wastewater collection, treatment and disposal	Chemical industries
12	National & RG awards	Recognition and cash prize of Rs. 1 lakh (0.1 mn)	• Innovation in pollution control	Industries from the 17 polluting categories
		Recognition and cash prize of Rs. 2 lakh (0.2 mn)	• Innovation in clean technology	
13	Steel awards	Recognition and grant of Rs. 1 crore (10 mn) for labour welfare	• Adoption of ISO 14001 and any other innovation in industrial wastewater management	Steel industry
14	Green Rating Project	Graded rating of industry	• Environmental sustainability – meeting global benchmarks	Large scale industries

Gap #1: Increase the focus on industrial wastewater management

Type	Existing incentive scheme	Degree of focus on industrial wastewater management		
		Mandatory	Major component	Primary objective
Subsidy	CETP Scheme (discontinued)	✓	✓	✓
	IPDS (for textile clusters)	✓	✓	✓
	MSE-CDP	-	-	-
	Modified IIUS	-	-	-
	CLCSS	-	-	-
	ILDP (for leather clusters)	✓	✓	✓
	MIIP (Uk)	-	-	-
	HIIEPP (Uk)	-	-	-
	Clean Technology scheme	-	-	-
Marketing promotion	ZED certification	✓	-	-
	Eco mark	✓	-	-
	Responsible Care (for chemical industries)	✓	✓	-
	National & Rajiv Gandhi Awards	-	-	-
	Steel awards	-	-	-
	Green Rating Project	✓	✓	-

Gap #2: Coverage of activity chain can be expanded

Type	Existing incentive scheme	Activities in value chain incentivized									
		Resource efficiency		Pre-treatment*		Conveyance		Effluent treatment**		Disposal of sludge#	
Subsidy	CETP Scheme	-	-	-		-		✓	-	-	-
	IPDS	-	-	-	-	-	-	✓	✓	-	-
	MSE-CDP	-	-	-	-	✓	-	✓	-	-	-
	Modified IIUS	-	-	-	-	✓	-	-	-	-	-
	CLCSS	✓	-	-	-	-	-	✓	-	-	-
	ILDP	-	-	-	-	-	-	✓	-	✓	-
	MIIP (Uk)	-	-	-	-	-	-	✓	-	-	-
	HIIEP (Uk)	-	-	-	-	-	-	✓	-	-	-
Marketing promotion	ZED certification	-	✓	-	-	-	-		✓	-	-
	Eco mark	-	-	-	-	-	-		✓	-	-
	Responsible Care	-	-	-	-	-	-		✓	-	✓
	National & RG Awards	-	✓	-	-	-	-		✓	-	-
	Steel awards	-	-	-	-	-	-		✓	-	-
	Green Rating Project		✓	-	-	-	-		✓	-	✓

* In case of CETP
** Includes discharge, ZLD, recycling, recovery, etc.
# Includes resource recovery, secure landfill, etc.

Infrastructure development
Operation and maintenance

Gap #3: Coverage of industrial sectors can be expanded – Capital subsidies

S. No	Industry Sector	WPI	CETP Scheme	IPDS	MSE-CDP	MIIUS	CLCSS	ILDP
1	Textiles	40						
2	Chlor Alkali	40						
3	Thermal Power Plants	40						
4	Ferrous and Non-ferrous metals	40						
5	Fertilizer	40						
6	Petrochemicals Manufacturing	40						
7	Pharmaceuticals	40						
8	Pulp & Paper	40						
9	Distillery	40						
10	Chemicals	30						
11	Tanneries	30						
12	Food Processing	30						
13	Sugar	30						
14	Paints	30						
15	Pesticides	30						

- Even in sectors which are covered, overall effectiveness of these incentives needs improvement
- WPI: Water Pollution Index of CPCB, estimated out of 40.

Gap #3: Coverage of industrial sectors can be expanded - Recognition

S. No	Industry Sector	WPI	ZED certification	Eco Mark	Responsible Care	National & RG Awards	Green Rating
1	Textiles	40					
2	Chlor Alkali	40					
3	Thermal Power Plants	40					
4	Ferrous and Non-ferrous metals	40					
5	Fertilizer	40					
6	Petrochemicals Manufacturing	40					
7	Pharmaceuticals	40					
8	Pulp & Paper	40					
9	Distillery	40					
10	Chemicals	30					
11	Tanneries	30					
12	Food Processing	30					
13	Sugar	30					
14	Paints	30					
15	Pesticides	30					

- Even in sectors which are covered, overall effectiveness of these incentives needs improvement
- ZED is limited to only MSMEs, while GRP & Responsible Care are limited to large scale industries

Gap #4: Stakeholders such as operators / service providers not included

Type	Existing incentive scheme	Beneficiary for industrial wastewater related incentives				
		Industries	Industrial clusters	CETP operator	Other solution providers	State agency
Subsidy	CETP Scheme	-	✓	-	-	-
	IPDS	-	✓	-	-	-
	MSE-CDP	-	-	-	-	✓
	Modified IIUS	-	-	-	-	✓
	CLCSS	✓	-	-	-	-
	Sub-scheme of ILDP	-	✓	-	-	-
	MIIP (Uk)	✓	-	-	-	-
	HIIEPP (Uk)	✓	-	-	-	-
	Clean Technology Scheme	✓	✓	-	-	-
Marketing promotion	ZED certification	✓	-	-	-	-
	Eco mark	✓	-	-	-	-
	Responsible Care	✓	-	-	-	-
	National & Rajiv Gandhi Awards	✓	-	-	-	-
	Steel awards	✓	-	-	-	-
	Green Rating Project	✓	-	-	-	-

Gap #5: Reputational incentives could be linked to substantial tangible

No.	Existing scheme	Incentive	Aspect of industrial wastewater incentivized	Beneficiary of the incentive
1	ZED certification	Recognition in the form of graded ratings 80%, 60% and 50% for micro, small and medium enterprises respectively for rating and hand-holding assistance 25% concession in loan processing charges at SBI and Yes Bank for gold or higher rating 0.25% reduction in interest on loans from SBI for diamond and platinum rated MSMEs	• Implementing systems for waste reduction, pollution control and maintenance of pollution control equipment • Achieving outcomes in terms of resource efficiency and pollution control	MSME industries
2	Eco-mark	License for use of Eco mark logo on products	• Compliance with effluent standards	Consumer product manufacturing industries
3	Responsible Care	License for use of Responsible Care logo	• Comprehensive management of wastewater collection, treatment and disposal	Chemical industries
4	National & RG awards	Recognition and cash prize of Rs. 1 lakh (0.1 mn) Recognition and cash prize of Rs. 2 lakh (0.2 mn)	• Innovation in pollution control • Innovation in clean technology	Industries from the 17 polluting categories
5	Steel awards	Recognition and grant of Rs. 1 crore (10 mn) for labour welfare	• Adoption of ISO 14001 and any other innovation in industrial wastewater management	Steel industry
6	Green Rating Project	Recognition in the form of a graded rating	• Compliance with norms	Large scale industries

Gap #6: Reach of incentives could be increased

No.	Existing incentive scheme	Time period	Number of beneficiaries
1	CETP Scheme	1997-2017 (20 years)	119 CETPs (estimated)
2	IPDS	2012 – present (7 years)	7 CETPs
3	MSE-CDP	1994 – present (25 years)	141 common + 240 infrastructure (3 in Uttarakhand)
4	Modified IIUS	2003 – present (16 years)	52 industrial clusters*
5	CLCSS	2000 – present (19 years)	14,155 MSE units*
6	Sub-scheme of ILDS	2002 – present (17 years)	6 CETPs
7	MIIP (Uk)	2015 – present (4 years)	0
8	HIIEPP (Uk)	2018 – present (1 year)	0
9	ZED certification	2016 – present (3 years)	266 MSMEs
10	Eco mark	1991 – present (28 years)	12 products across 10 companies until 2007
11	Responsible Care	2006 – present (13 years)	48 industries
12	National & RG Awards	1992 – present (27 years)	Information not available
13	Steel awards	1993 – present (26 years)	Information not available

Gap #7: Monitoring frameworks could be made output/ outcome-oriented

Type	Existing incentive schemes	Point of monitoring (Present)			
		Development	Operations	Output	Outcome
Subsidy	CETP Scheme	✓	-	-	-
	IPDS	✓	✓	-	-
	MSE-CDP	✓	-	-	-
	Modified IIUS	✓	-	-	-
	CLCSS	✓	✓	-	-
	Sub-scheme of ILDP	✓	-	-	-
	MIIP (Uk)	✓	-	-	-
	HIIEPP (Uk)	✓	-	-	-
Marketing Promotion	ZED certification	-	✓	-	-
	Eco mark	-	✓	-	-
	Responsible Care		✓	-	-
	National & Rajiv Gandhi Awards	-	✓	-	-
	Steel awards	-	✓	-	-
	Green Rating Project	-	✓	-	-

Overall Gaps in the existing incentive framework

1. Greater emphasis can be placed on industrial wastewater management
2. Coverage of activity chain can be expanded
3. Coverage of industrial sectors can be expanded
4. Stakeholders such as CETP operators and other service providers can be included
5. Reputational incentives can be linked to substantial tangible benefits
6. Reach of incentives can be further increased
7. Monitoring framework could be made output, outcome-oriented

Industry (private sector) perception / preferences on incentive mechanisms

- **Industry Associations**
- **Technology service providers**
- **Industries / estates**
- **CETP operators**
- **Technical experts**

1. **Avoid direct financial incentives** (Grants / subsidies are attached with long procedural requirements).
2. **If financial incentives are to be provided – they can be indirect in nature**
   - Reduction in consent fees, Tax or trade benefits, Interest subvention, etc.
3. **Incentives should lead to ease of doing business**
   - Extension in validity period of ‘consent to operate’
   - Fast-tracking of applications for consent
4. **Recognition should be at a larger scale and on transparent mechanisms**
   - Consumer orientation - Certification / grades

What is to be incentivised ?

What is being incentivised?		
No.	**Existing scheme**	**Aspect of industrial wastewater incentivized**
1	ZED certification	• Process improvements towards resource use efficiency and pollution control
2	Eco-mark	• Compliance with effluent standards
3	Responsible Care	• Comprehensive management of wastewater collection, treatment and disposal
4	National & RG awards	• Innovation in pollution control • Innovation in clean technology
5	Steel awards	• Adoption of ISO 14001 and any other innovation in industrial wastewater management
6	Green Rating Project	• Meeting global benchmarks
7	CETP Scheme	• Construction of CETPs
8	Modified IIUS	• CETP / ZLD
9	IILDP	• CETP / ZLD

What can be further mainstreamed?

- Adoption of environment management systems and processes
- Treatment of effluent beyond minimums required by regulations
- Wastewater recycling, reuse, zero liquid discharge
- Resource efficiency*
- Self reporting/ public disclosure
- Early compliance with new charters/ revised standards by concerned industries
- Early adopters of self-assessment, online effluent monitoring and third party environmental audits
- Promoting sustainability in severely & critically polluted areas, over-exploited ground water zones

* Groundwater needs to be looked at separately and in further detail

Suggestions and Recommendations – Implementation mechanisms

- There are six broad types of possible incentive mechanisms

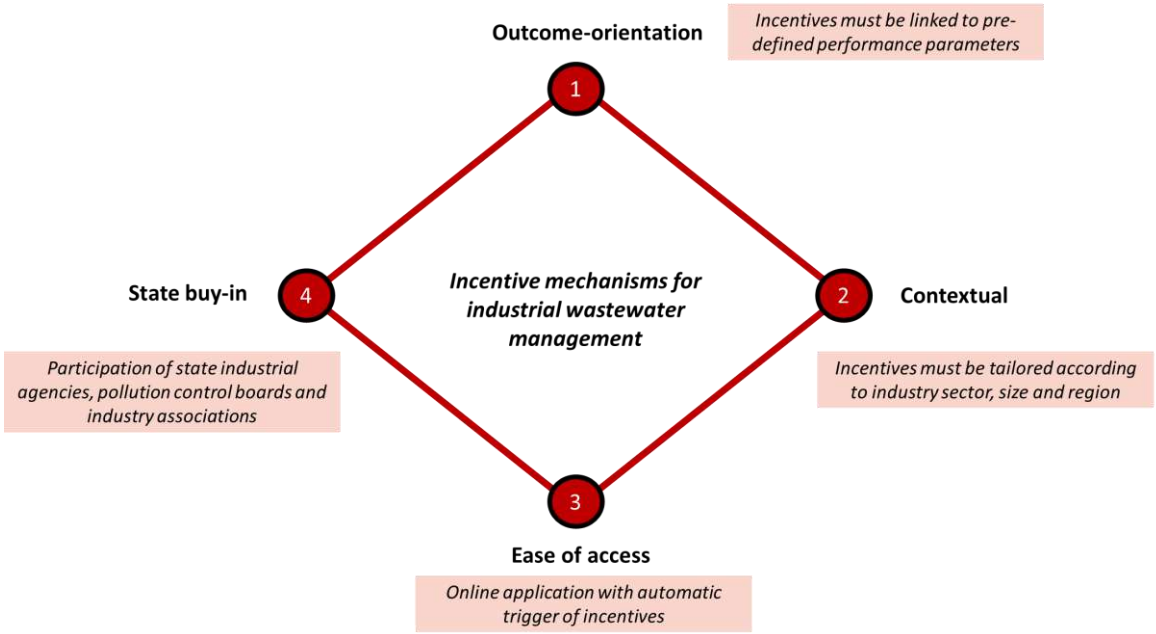
Incentive	Legislation	Impact	Monitoring	Precedence	Aggregate
Effluent charges (Qual./Quan.)	○	🟡	🔴	🟡	🔴
Subsidies	🟢	🟢	🟢	🟢	🟢
Tradable permits	○	🟡	🔴	🔴	🔴
Liabilities	○	🟡	🟢	🟡	🟡
Ease of doing business	🟢	🟢	🟢	🟢	🟢
Recognition linked benefits	🟢	🟢	🟢	🟢	🟢

- Of these tradable permits and liability mechanisms are not well suited in the context of industrial wastewater
- Considering implementation challenges, three incentives types could be explored in short term
  - Subsidies
  - Ease of doing business
  - Recognition linked benefits
- Effluent charges could be explored in the long term

Suggestions and Recommendations – Incentive framework

Aspect to be incentivized	Types of incentive	Incentive mechanism
Adoption of EMS	• Ease of doing business • Reputational incentives	• Environmental ratings
Advanced effluent treatment	• Ease of doing business • Reputational incentives • Financial incentive	• Effluent charges • PPP based subsidy schemes • Environmental ratings
Wastewater recycling, ZLD	• Ease of doing business • Reputational incentives • Financial incentive	• Effluent charges • PPP • Subsidy schemes • Environmental ratings • Tradable permits
Resource efficiency	• Ease of doing business • Reputational incentives • Financial incentive	• Effluent charges • Environmental ratings
Adoption of clean technology	• Ease of doing business • Reputational incentives • Financial incentive	• Effluent charges • Subsidy schemes • Environmental ratings
Self reporting and public disclosure	• Ease of doing business • Reputational incentives	• Environmental ratings

Suggestions and Recommendations – Priority interventions



1 Public-Private Partnerships (for CETPs) - Concept

Beneficiary	Incentive	Aspects incentivized
CETP management agency	• Capital subsidy	• Investment for setting up/ upgrade of CETP
	• Performance-linked grants	• Achieving desired effluent output • Self-monitoring of pollution • Adoption of EMS
Industrial units	• Variable effluent tariff	• Water conservation • Pre-treatment of effluent

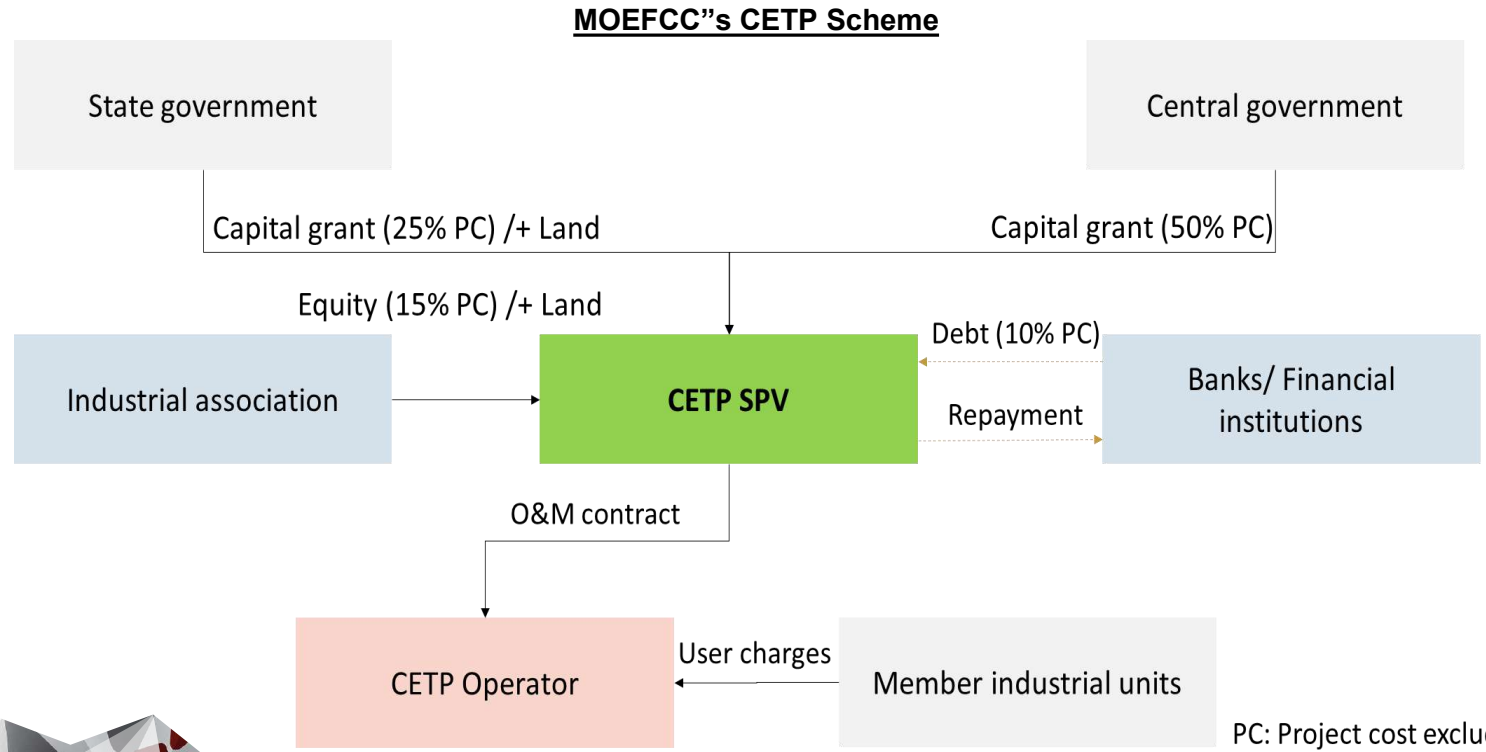
Monitoring & evaluation

- Capital subsidy as well as performance-based payment linked to assessments by third party auditors

Scheme financing

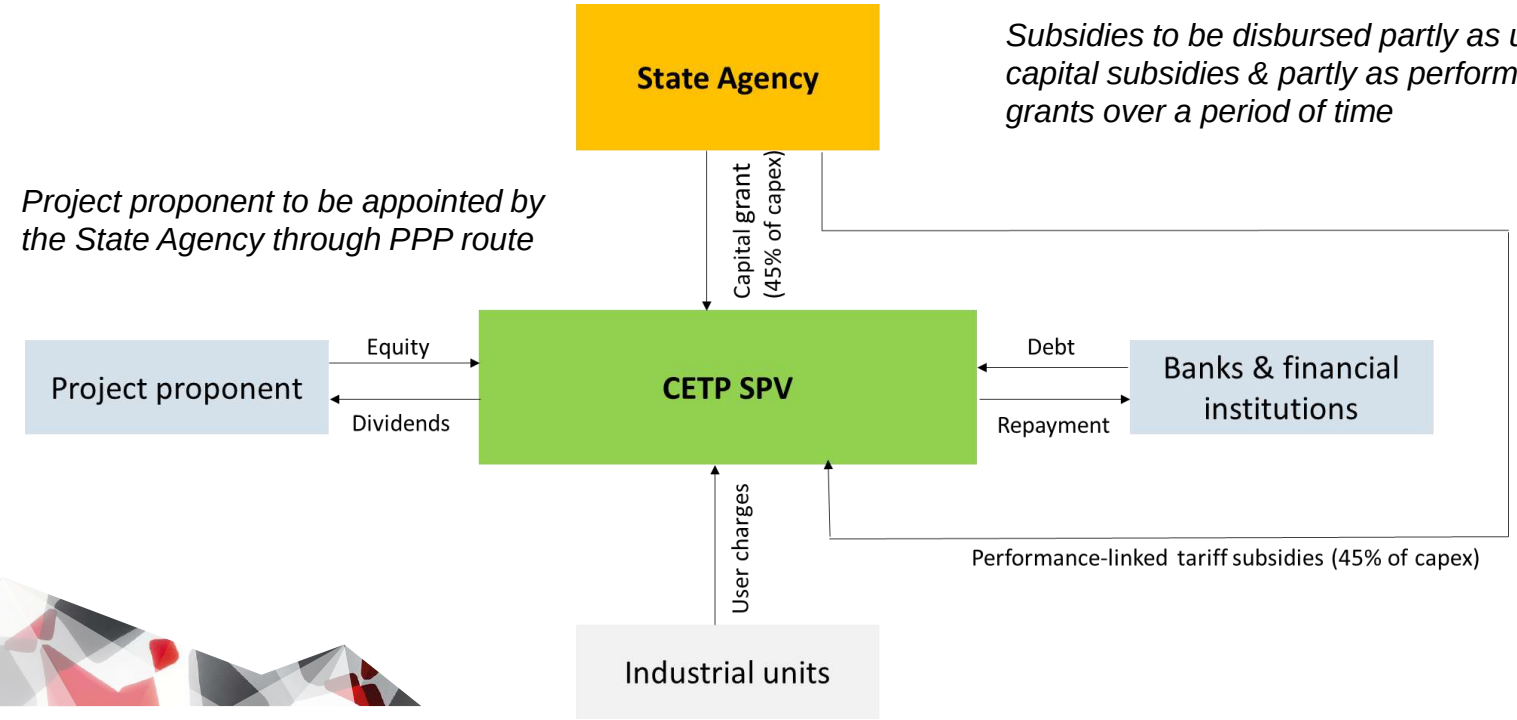
- Overall subsidy (upfront capital & performance grants) to be limited to 75% of project cost
- Subsidy to be contributed by industrial association, state government and central government

Institutional framework – Present

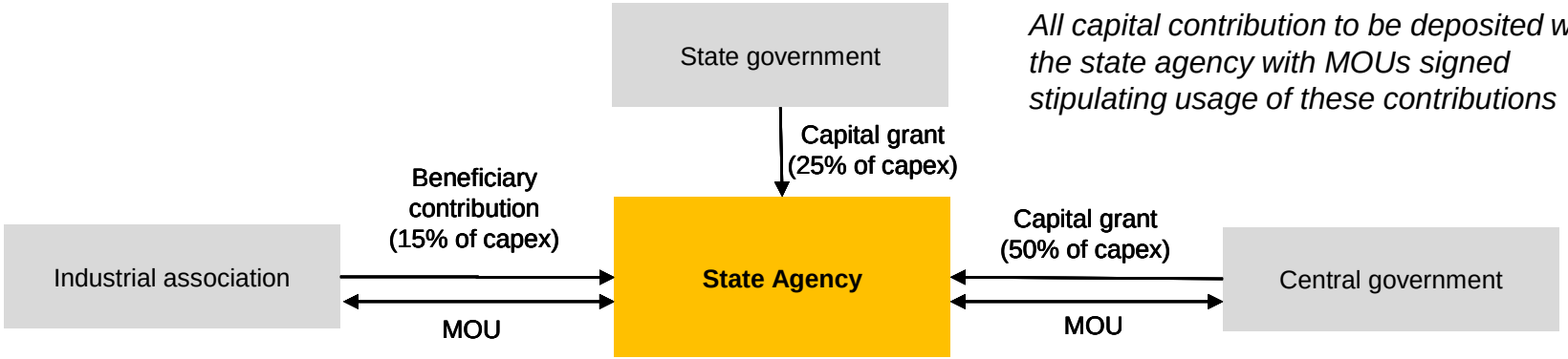


PC: Project cost excluding land

1 Public-Private Partnerships (for CETPs)– Larger role of state governments

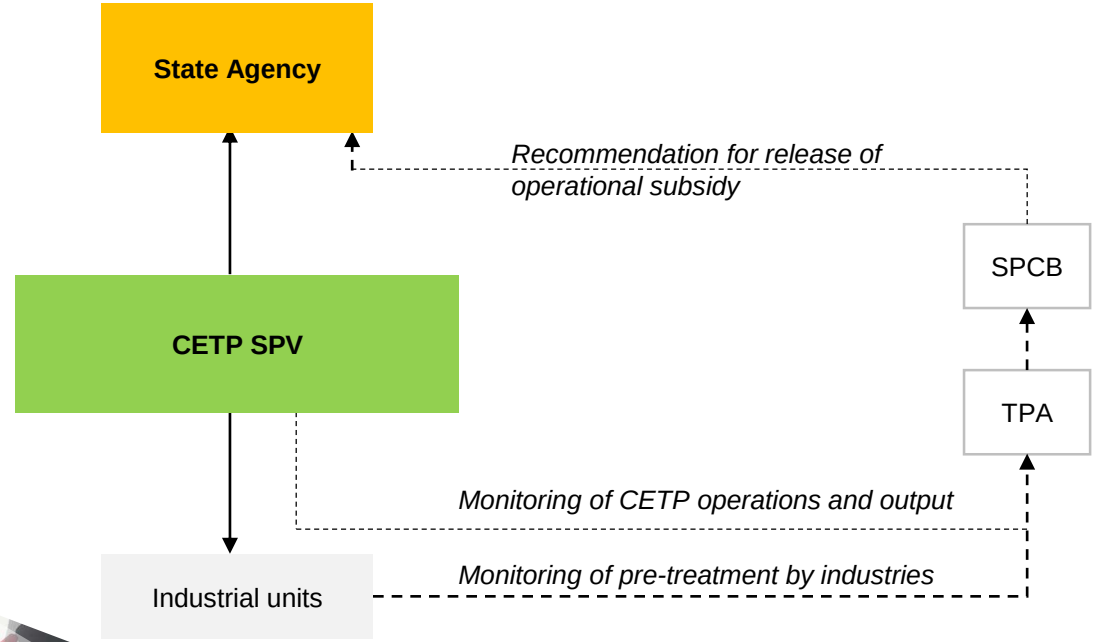


1 Public-Private Partnerships (for CETPs) – Institutional framework



All capital contribution to be deposited with the state agency with MOUs signed stipulating usage of these contributions

1 Public-Private Partnerships (for CETPs) – Institutional framework



Independent third party auditors (TPA) to periodically monitor CETP as well as the member units.

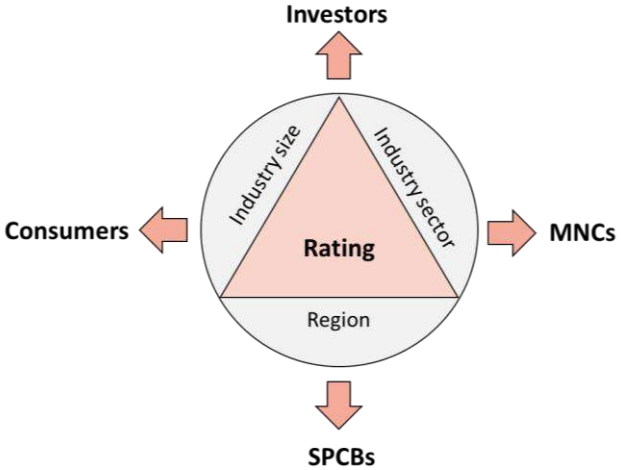
Disbursal of performance grants to be based on recommendations of the State Pollution Control Board (SPCB)

2 Environmental ratings linked to tangible benefits – Concept

- Need for a composite environmental rating covering all environmental aspects including water, air, noise, waste, etc.
- Rating or index must be acceptable to all stakeholders including MOEFCC and CPCB
- Could be based on an existing rating system or a new rating system
  - Ministry of MSME/ QCI's ZED Certification
  - CSE India's Green Rating Project
  - MOEFCC/ BIS's Eco mark
  - Integrated Industrial Park Rating System
- Wastewater linked incentives to be based on rating parameters pertaining to industrial wastewater management

Rating design influenced by beneficiary as well as users

Categorization of ratings based on size, sector & rankings by region



Design of rating considering various users such as retail consumers, MNCs, investors as well as regulators

2 Environmental ratings linked to tangible benefits - Concept

Beneficiary	Incentive	Aspects incentivized
Industrial units (all industry categories)	• Recognition • Concession in consent • Preferred procurement • Subsidized loans	• Resource efficiency & clean technology • Capital investment in pollution control equipment • Performance better than CTO terms • Self-monitoring of pollution • Responsible supply chain management • Adoption of EMS
Industrial units (MSMEs)	• Technical assistance	
Industrial cluster	• Recognition	• Collective efforts for environment protection
Industrial association	• Recognition	• Mobilizing industrial units for adoption of incentives • Fostering knowledge exchange between units
Solution providers	• Recognition	• Providing workable solutions to industries

Monitoring & evaluation

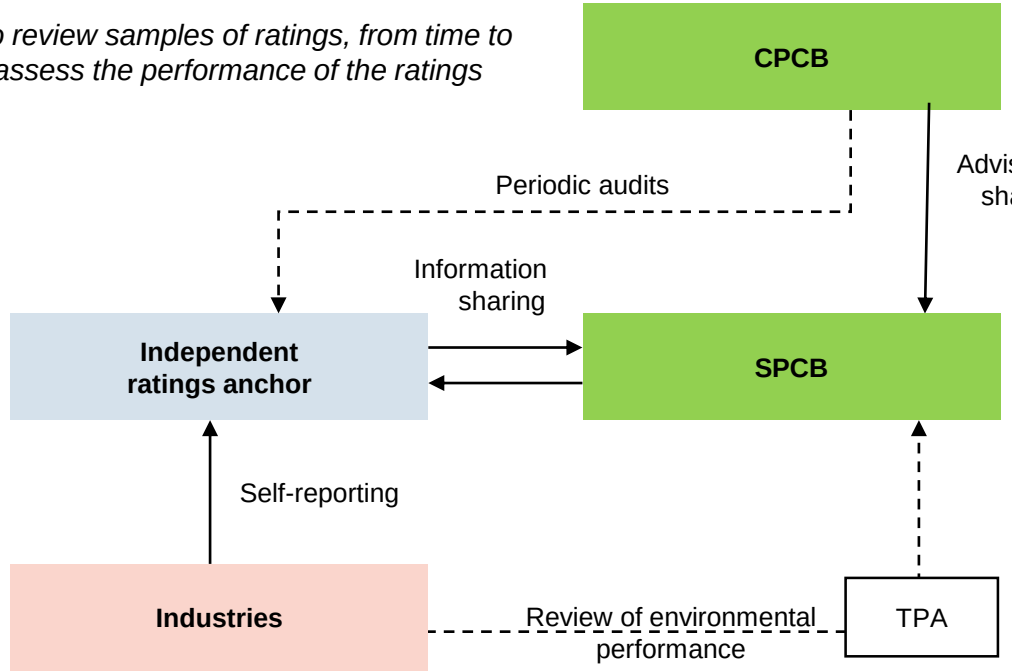
- Incentives linked to improvement in environmental rating as assessed by third party auditors

Scheme financing

- Subsidies to be contributed by state government and central government

2 Environmental ratings linked to tangible benefits – Institutional framework

CPCB to review samples of ratings, from time to time, to assess the performance of the ratings anchor



State pollution control boards (SPCB) to provide information to ratings anchor for verification of claims made by the industries

Third party agencies (TPA) to periodically review environmental performance of industries in their self-reporting

3 Effluent charges – Legal considerations

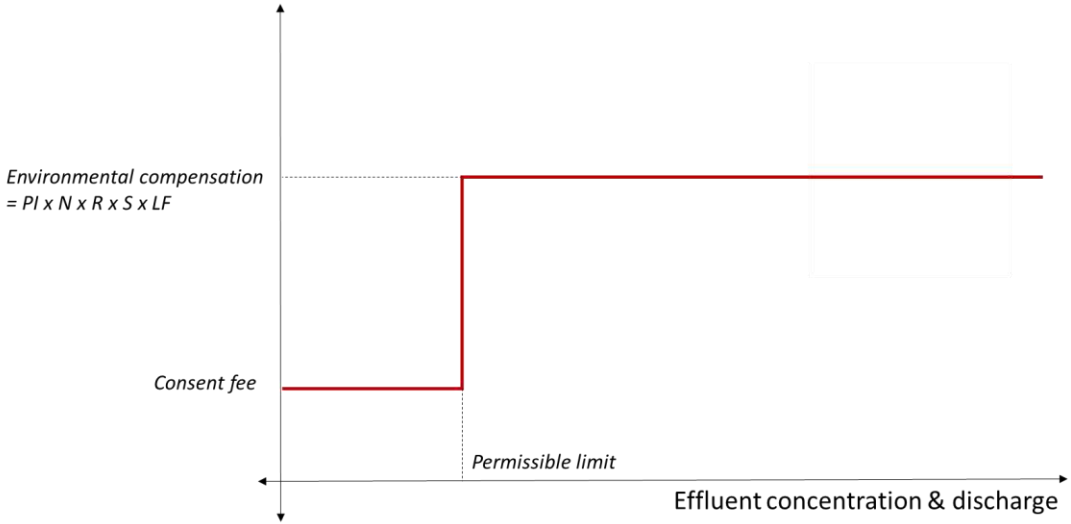
Water (Prevention & Control of Pollution) Act, 1974

- An application for consent of the State Board under sub-section (1) shall be made in the such form, contain such particulars and shall be accompanied by such fees as may be prescribed (Section 25, (2))
- Power of State to make rules which may provide for the form of application for consent of the State Board under sub-section (2) of section 25 and the particular it may contain (Section 64, (2), (k))

- At the state level, rules could be modified to structure consent fee in the form a fixed and variable component

- Water Act could also be modified to empower SPCBs to levy effluent charges in the form of an eco-tax

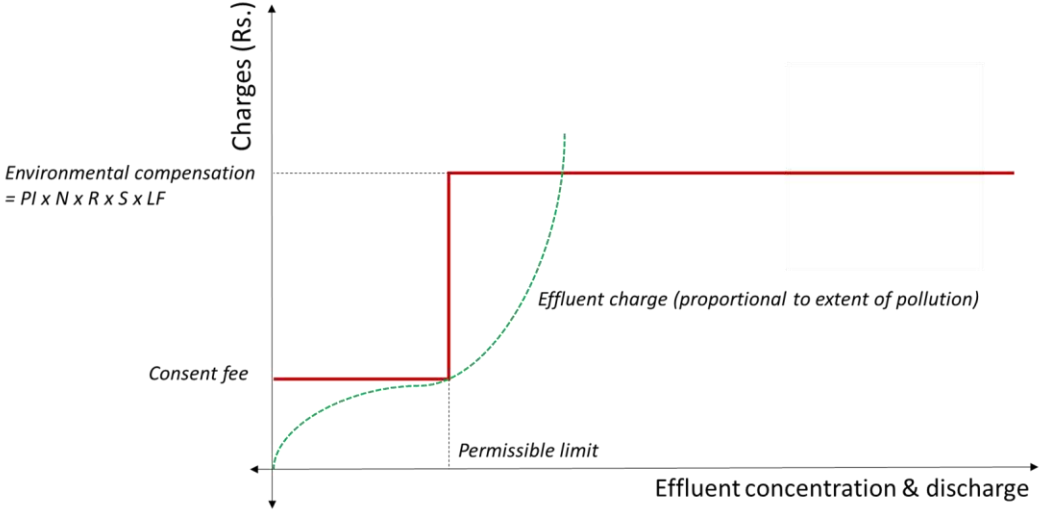
3 Effluent charges – Present scenario



Penalty for violation

No reward for going beyond compliance

3 Effluent charges – Proposed



- Encourages robust self-monitoring & adoption of EMS by industries
- Incentives for reducing not only number of instances but also extent of violation
- Incentives for going beyond norms to achieve cost cost-savings

3 Effluent charges – Germany

- Effluent charge fixed in proportion to ‘damage units’.
- 1 damage unit = 20% of permissible annual load of a given pollutant
- Charge for one damage unit - 35.8 euros (2010)

Charges levied on following pollutants:
COD, phosphorous, nitrogen, organic halogens, mercury, cadmium, chromate, nickel, lead, copper and toxicity for fish eggs

Incentives linked to effluent charges:
- Reduction of 50% on effluent charges for industries going beyond compliance
- Tax deduction for a period of 3 years on investments for sustainable wastewater management

Recommendations & suggestions

1. PPP (for CETPs)

2. Ratings linked to benefits

3. Effluent charges

Immediate (2020)

Short-term (2021)

Medium-term (2022)

Need for incentives

- Need to encourage industries to stay ahead of regulatory curve
  - Industries should not limit environment protection efforts to regulatory compliance requirements
  - Industries should adopt best available technology and practices for environment protection

- However, industries may not be always be able to internalize benefits arising from environment protection

- Thus, need for incentives which can provide a business case for industries to invest in sustainable industrial wastewater management

No.	Existing incentive scheme	Number of beneficiaries	Source
1	CETP Scheme	119 CETPs (estimated)	Report of sub-group on Env. For 12th FYP; Annual reports of MOEFCC
2	IPDS	7 CETPs	Statistics shared by Ministry of Textile, Office of U/S
3	MSE-CDP	Approved common facilities: 141 Approved infrastructure projects: 240	https://dcmsme.gov.in/MSE-CDProg.htm# Last update: 18-10-2019
4	Modified IIUS	57 industrial clusters*	dipp.gov.in; last update: 18-09-2019
5	CLCSS	14,155 MSE units*	my.msme.gov.in
6	Sub-scheme of ILDS	6 CETPs	11th FYP
7	MIIP (Uk)	0	Directorate of Industries, Uttarakhand
8	HIIEPP (Uk)	0	Directorate of Industries, Uttarakhand
9	ZED certification	266 MSMEs	zed.org.in
10	Eco mark	12 products across 10 companies until 2007	Research Report, CUTS CITEE (2007)
11	Responsible Care	48 industries	Responsible Care website
12	National & RG Awards	Information not available	NA
13	Steel awards	Information not available	NA

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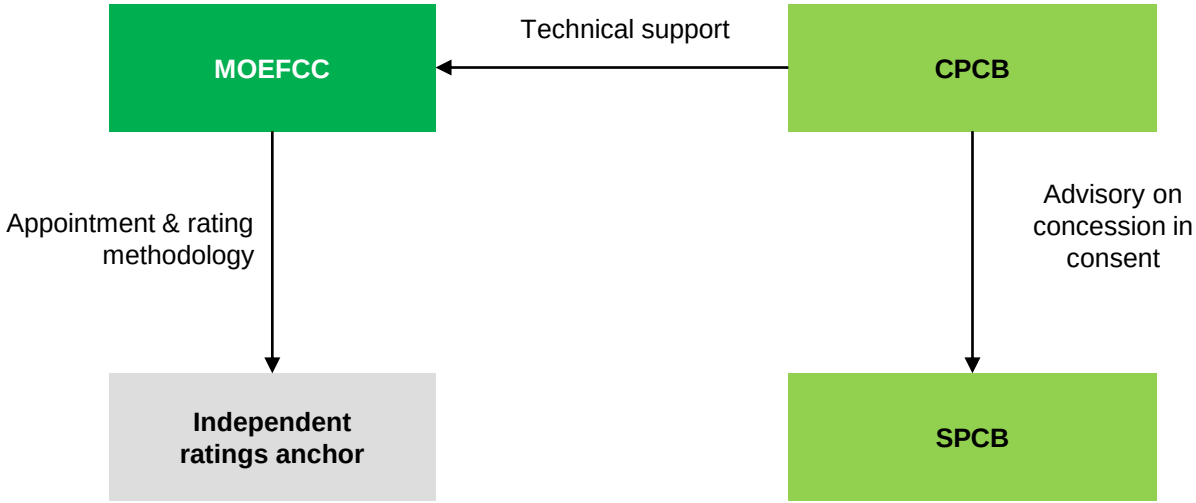
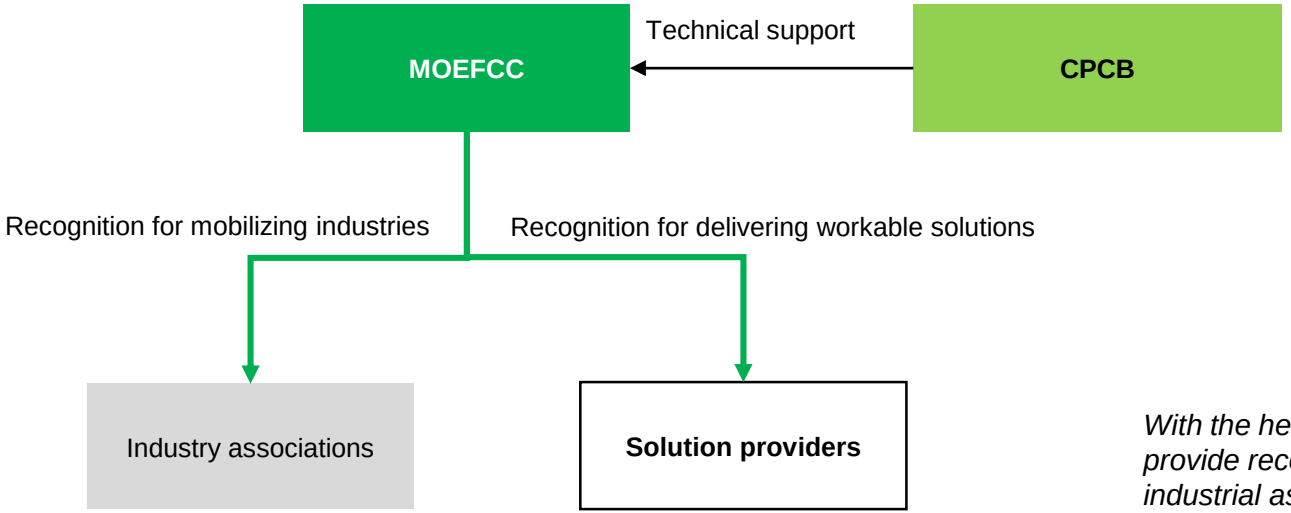
2 Environmental ratings linked to tangible benefits – Institutional framework



MOEFCC, with the help of CPCB, could approve the assessment methodology to be adopted by the rating anchor

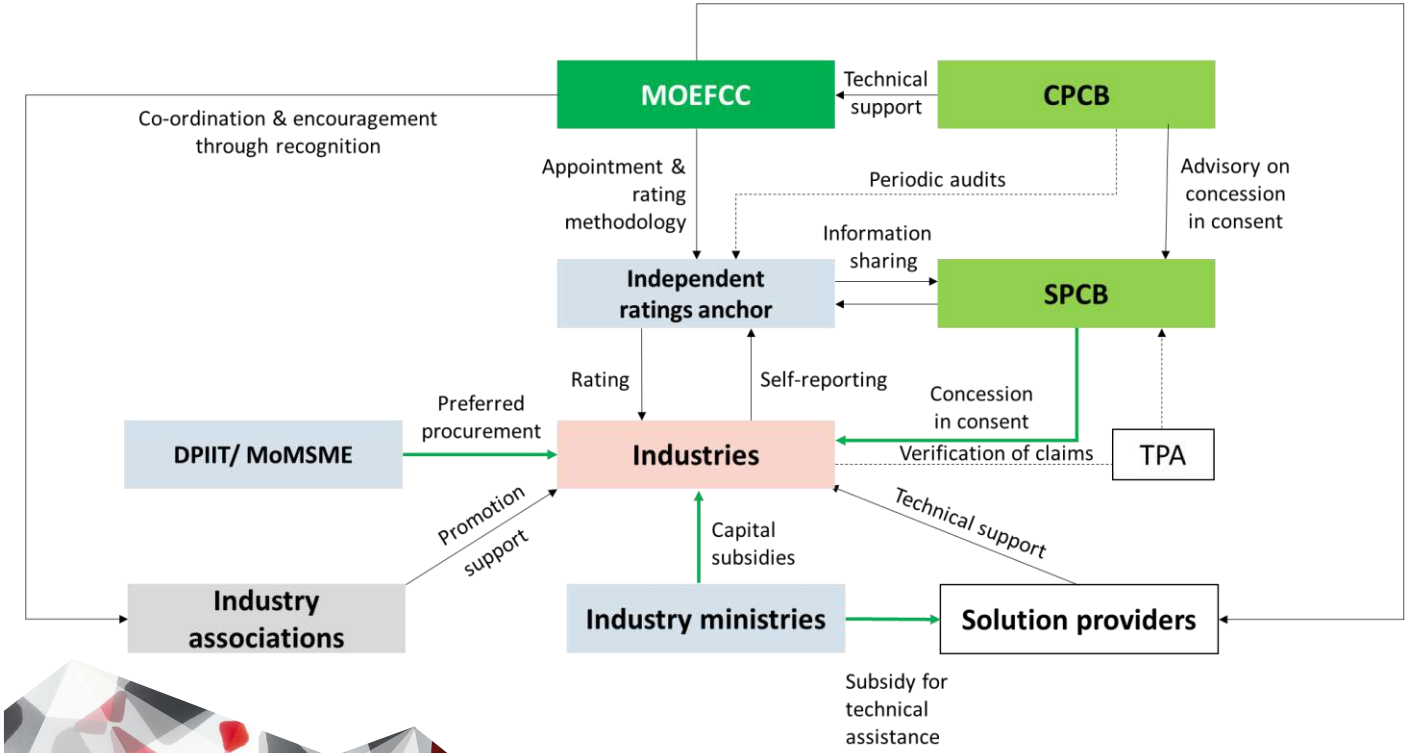
CPCB could provide technical assistance to SPCBs in the form of guidelines for rolling out concessions in the consent based on the ratings

2 Environmental ratings linked to tangible benefits – Institutional framework



With the help of CPCB, MOEFCC could also provide recognition to the best performing industrial associations and solution providers

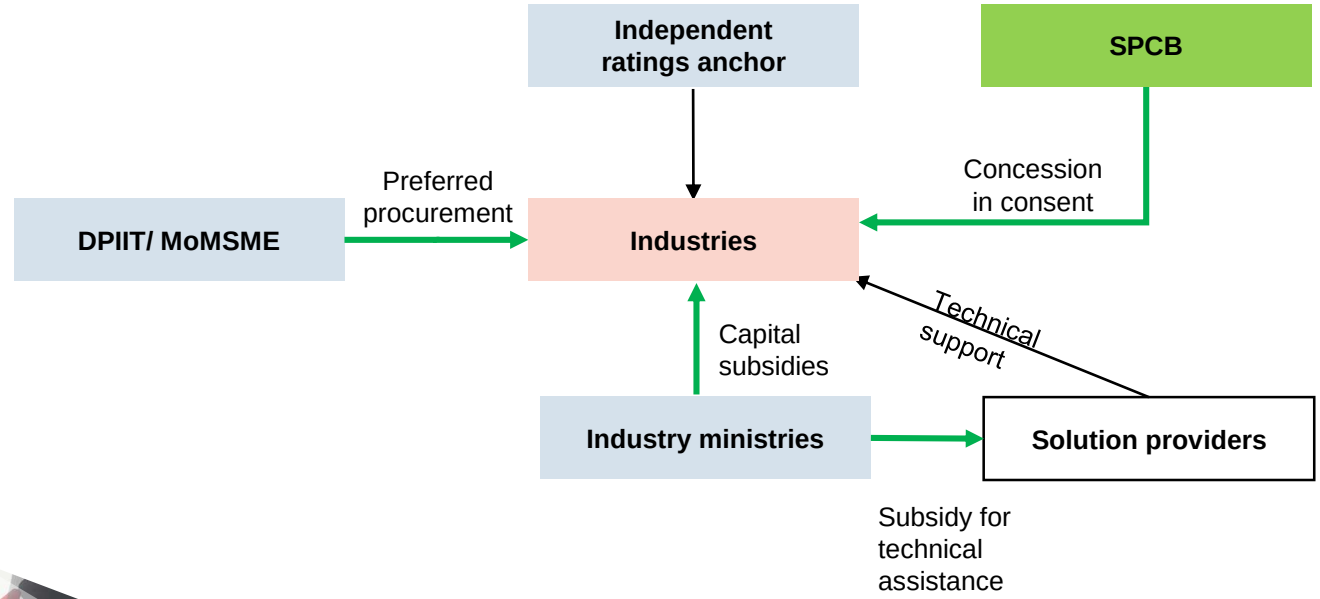
2 Environmental ratings linked to tangible benefits – Institutional framework



Equivalence could be established between existing rating systems such as ZED certification and Eco mark

Cluster level & industrial park level ratings could be explored in collaboration with DPIIT's Industrial Park Rating System

2 Environmental ratings linked to tangible benefits – Institutional framework



Industries are rated by an independent third party agency

SPCB as well as industry ministries provide incentives linked to the environmental ratings

2 Environmental ratings – International examples

Components		PROPER Indonesia	ECOWATCH Philippines	GREEN WATCH China	AKOBEN Ghana	PRIDE Ukraine
Scheme Design	Nationwide Coverage	✓	✓	✓	✓	-
	Industrial Polluters	✓	✓	✓	✓	✓
	Tangible benefits for beyond compliance	-	✓	-	-	-
Performance Indicators	Consistency of previous rating	-	✓	-	✓	-
	Clean Technology	✓	✓	✓	-	✓
	Waste Minimization	✓	✓	-	-	✓
	Waste/ Sludge disposal	✓	-	✓	-	-
	Maintenance of monitoring equipment	-	✓	-	-	✓
	Grievance Redressal	✓	-	-	-	-
Monitoring	Environmental Management Systems	✓	✓	-	-	-
	Diligent Self-reporting	-	-	✓	✓	-
	Third Party Auditing/Field visits	✓	✓	✓	✓	✓
	Disincentives upon non-compliance	-	✓	✓	-	-

Thank you

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Output 4

[Baseline study for Strengthening of Knowledge Products' on Industrial Wastewater Management at National & State (Uttarakhand/Bihar) level to Combat Industrial Wastewater Pollution]

Stakeholder Consultation Workshop

Sustainable and Environment-friendly Industrial Production (SEIP) – II | 22.11.2019

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Presented by

National Productivity Council

National Productivity Council

Content

- Methodology & Approach for Gaps & Needs Assessment
- Feedback from Stakeholder meetings
- Key gaps and Needs identified
- List of Suggestions and Recommendations
- Elaboration of priority recommendations supported by International case examples
- Discussions

Methodology Adopted by NPC

1. Identification of varieties of knowledge products wrt industrial wastewater management

2. Mapping of stake holders and identifying various domains of industrial wastewater management

3. Exploration of KPs through secondary data collection, Primary data collection through visits, one-to-one meetings, group meetings etc

4. Categorization and inventorization of identified KPs and its evaluation by a standard evaluation criteria developed by NPC.

5. Questionnaire survey and analysis

6. Assessing requirement of type of KPs by respective stakeholders through responses, stakeholder workshops, persona meetings & internal brain storming

7. Assessment of gaps and need analysis based on survey responses and Interaction with several domain experts

8. Detail out suggestions/recommendations for new knowledge products required, ICT based tools that can be developed, modifications if needed for the existing knowledge products , approach for strengthening procedure etc

- **Evaluation Criteria**
- **Questionnaire survey**

Identification / Mapping of stakeholders

Category / Range of Stakeholders in the domain of industrial wastewater management

End users	Service provider	Academia	Regulatory bodies	Consultant / Third party auditors	Investors	Publisher
Industry / ETP/ CETP	Turnkey service providers	Professor / Teachers	Judiciary / NGT	MEP (Mechanical, engineering, Plumbing) Consultant	Financial institution / Banks	Authors
Plant Manager/ supervisor	Technology providers	PHD scholars / researchers	MoEF&CC	Third party auditors	Government bodies	writers
Plant operator/ technician	Equipment suppliers	Institutes	CPCB / SPCB	PMC (Project management) consultant	Industrial development authorities	-
Lab analyst	O&M providing agency	students	NMCG	NGOs	Industrial associations	-

Mapping of Various domains pertaining to industrial waste water management

Matrix for types of Knowledge products or Knowledge inputs utilised or needed in industrial wastewater Treatment and Management Domains					
S.no.	**1) Design / engineering / technology**	**2) Installation**	**3) Operation & maintenance**	**4) Regulatory compliance**	**5) Bid processing documents**
a)	unit operations/ Pre treatment / Primary / secondary/ tertiary treatment / ZLD, equipment sizing/ design vetting / feasibility	Supply	SOPs for each unit processes / equipment	Statutory requirement / EIA/ EC/ CTE/ CTO	Contractual requirement
b)	Process engineering & bio kinetics, Sludge generation / management	erection	Trouble shooting / Prevention and control	Discharge / Reuse standards	Finances / Available funding schemes
c)	Wastewater characterization and treatment process selection	testing / trial run	Laboratory Sampling & Analysis / analytic procedures	Plant adequacy	Evaluation Process

S.no.	1) Design / engineering / technology	2) Installation	3) Operation & maintenance	4) Regulatory compliance	5) Bid processing documents
d)	Conveyance / storm water drain/ piping network	Dry run / wet run	Accidental discharge plan	Environment Laws / regulation / rules/ Govt. notification	Life cycle assessment/cost assessment
e)	Land & area requirement	Pilot plant	Monitoring (Manual, online, real time, remote)/ Record keeping	certification & accreditation : MoEF / PCB/ NABL/ ISO etc.	Funding Model are EPC, BOOT, BOT etc.
f)	Costing , capital cost & operating cost	commissioning	Safety & Health Aspects	-	Investors
g)	Retrofit / capacity augmentation / system upgradation	stablization	Best Practices / skill development	-	-
h)	Pollution prevention and control at source / Resource recovery at source	List of service / technology providers	Energy conservation & efficiency	-	-
i)	Reject management	List of equipment providers	List of chemical providers	-	-

Key aspects of the standard evaluation criteria for evaluating KPs.

Details of the Knowledge Product

Indicative Range of Stakeholders Knowledge Product catering to

Objective / Purpose / Goal of the Knowledge Product

Content Quality & features with respect to Objectives & its scale

Content Gaps in Knowledge Product

Access / availability in public domain

Supporting Data / statistical insights presented via Tables / Diagrams

Utility Value: As per content of the Knowledge Product

Theoretical & practical strength of the Knowledge Product

SWOT Analysis of Knowledge Product

Any special features of the Knowledge Product in comparison with any other references

Specify requirement of new knowledge product

Generic Evaluation Criteria for Selected Knowledge Products in Wastewater Engineering and Management (Books / Handbooks / Guidelines / BAT / BREF etc)

1. Name of Knowledge Product / Publisher / Year / Author / Country of Origin etc

a. Handbook of Environmental Engineering, Volume 5: Advanced Physicochemical Treatment Technologies

b. Publisher – Humana Press, New Jersey

c. Author – Lawrence K. Wang, Yung-Tse Hung, Nazih K. Shammas

d. Country of Origin – USA

e. Year of Publication - 2007

2. Indicative Range of Stakeholders Knowledge Product catering to : Indicate stakeholders (or Scale 1 limited to 5 Wide scale)

-undergraduate and graduate students (5)

-designers of water and wastewater treatment systems (4)

- scientists and researchers (5)

SWOT Analysis

Strength	Weaknesses
▪ **Complete details of the advanced technologies, application, requirement and limitations are explained very well.** ▪ **The utility of this book is very vast considering the limited information available in public domain wrt advance treatment technologies.** ▪ **For better understanding, the handbook has given numerical examples, data tables and representative diagrams also.**	• The costing aspects of the technologies and the availability of these technologies are not elaborated. • While all the advantages of the different technologies are elaborated, a comparison amongst these advance technologies highlighting the treatment efficiencies, availability, accessibility and costing is not given
Opportunities	Threats
▪ **The last updation of this book was in 2007 and it can be further updated.** ▪ **The worldwide technology providers of these advance technologies can be added along with its cost.** ▪ **The performance of technologies with changing effluent characteristics and climatic conditions should be added** ▪ **Troubleshooting during operation can be added in further editions.** ▪ **New data of success stories and achieved treatment efficiencies can also be added**	▪ The conventional wastewater treatment technology are well proven and accepted all over the world. The acceptance to new and advance technologies is challenging. ▪ Advance technologies, are more scientific, energy efficient, are more robust and therefore have a higher capital expenditure unlike conventional technologies.

Information sought through questionnaire survey

Classification of Category of stakeholder wrt industrial wastewater management

Identification of domain of wastewater pertaining to them

Type of Knowledge product most commonly referred by the stakeholder

Utility of referred KP wrt to content user friendliness, comprehensiveness, adequacy and usefulness

Requirement of any new knowledge product by the stakeholder

Gaps / improvement required in the existing KPs referred by them

Consultations Undertaken with

- CETP societies
- ETP owners/ managers
- Industries
- Regulatory bodies
- Technology providers
- O&M service providers
- Wastewater domain experts
- Academicians
- Consultants
- Investors

Stakeholder perspective on existing knowledge products being used by them

Identification of new knowledge products required in their respective domain

Undertaking a set of exercises for mapping of stakeholders in the wastewater sector

Elements to be explored via a well designed questionnaire

Consultation undertaken

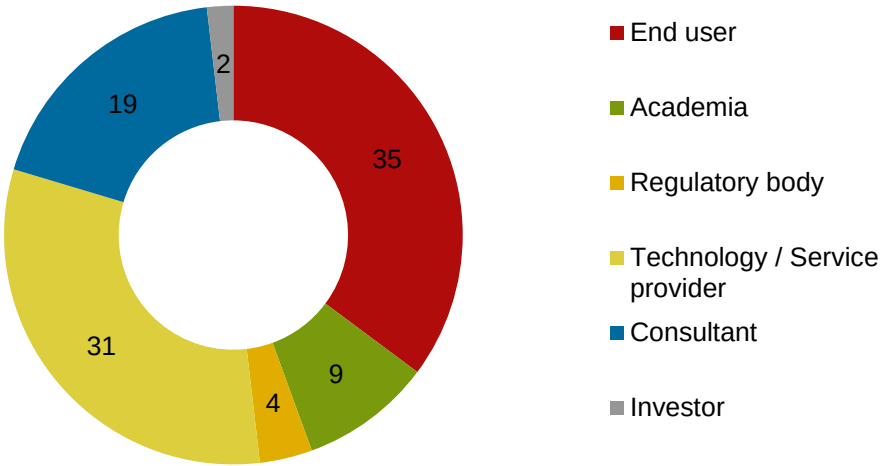
Identifying feasible approach for project execution

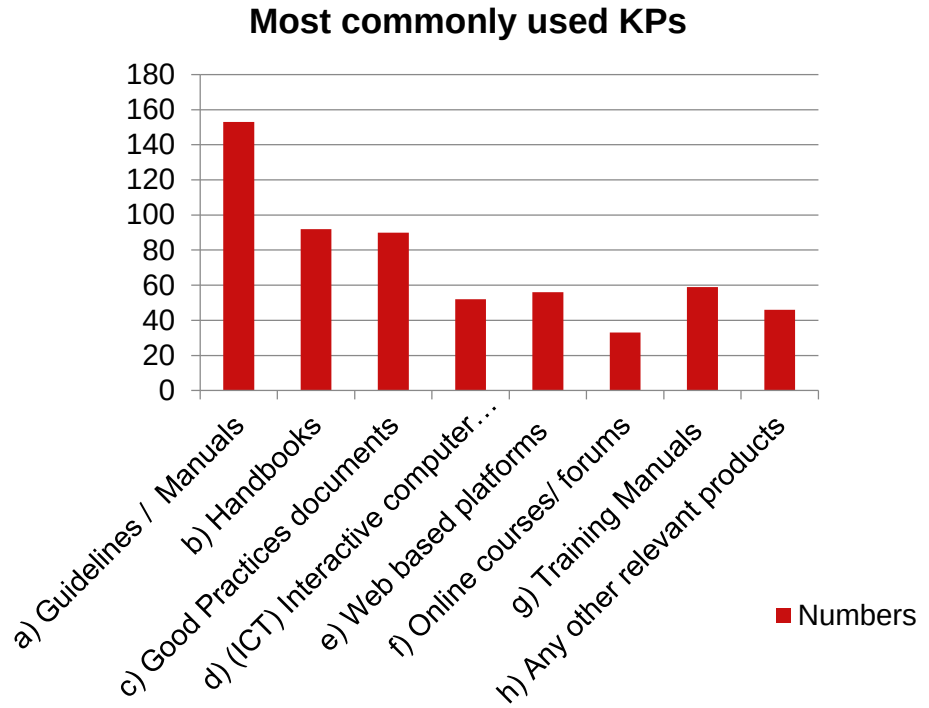
Identifying and listing stakeholders to reach and contact for inputs

To seek participants for enabling multiplier effect of the project

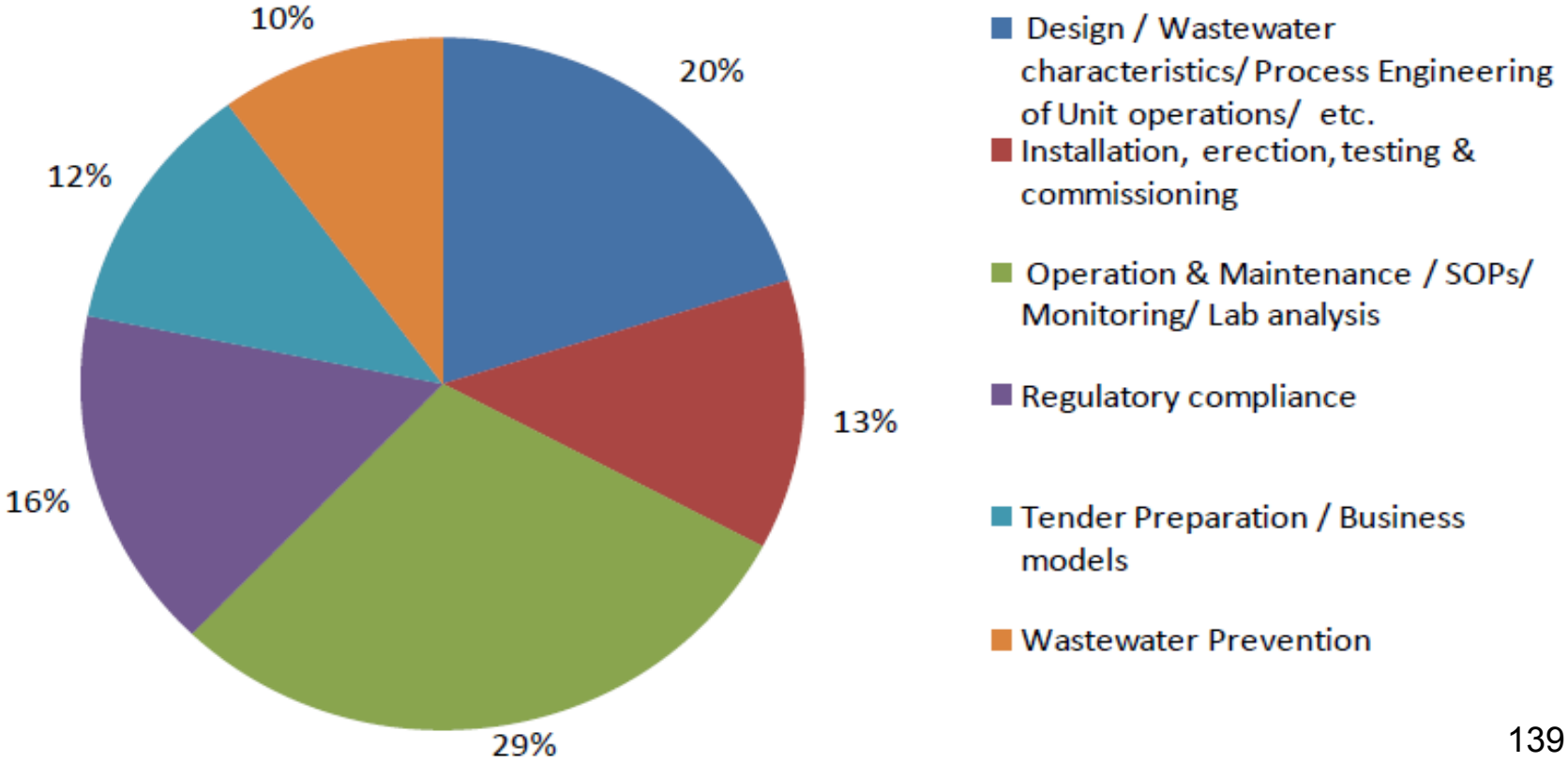
To receive periodic guidance

Questionnaire Responses from 54 stakeholders & Comparative perspective on KPs referred

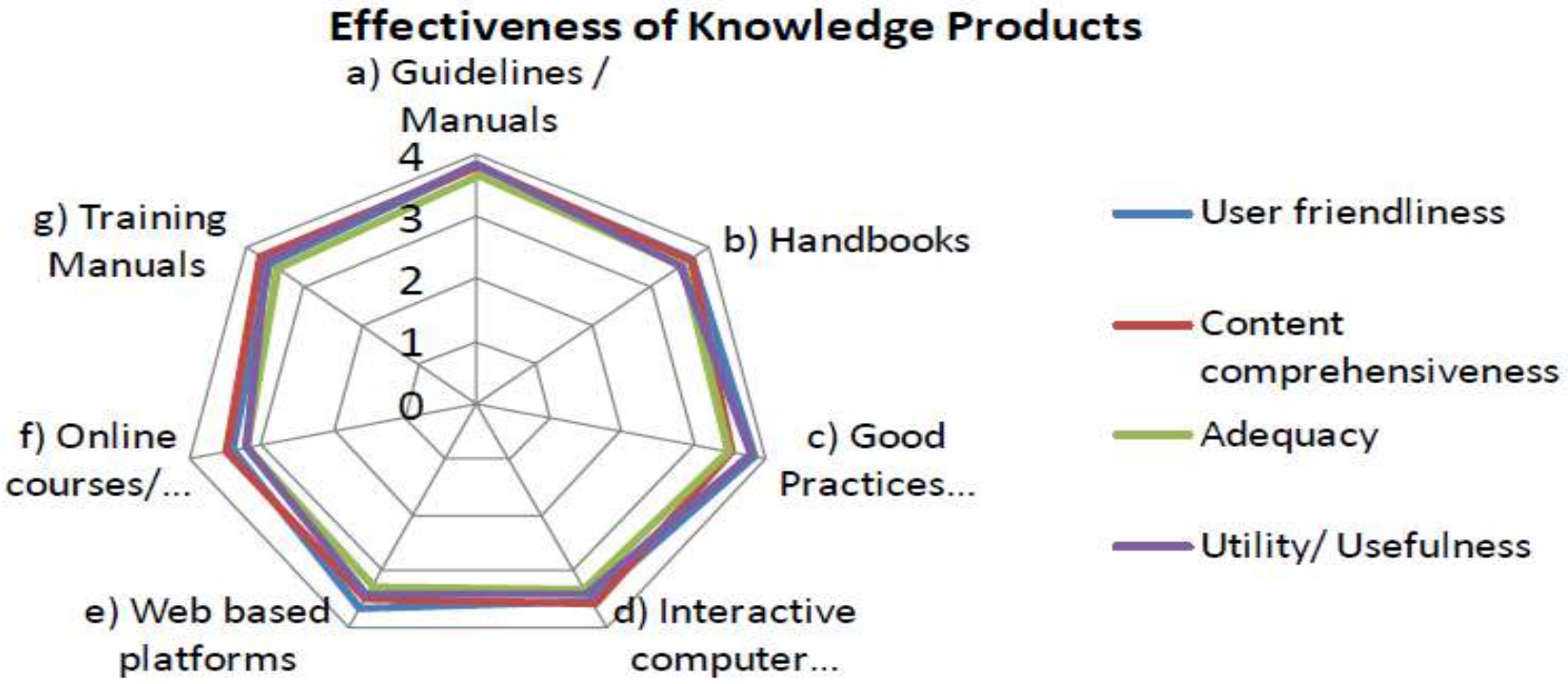




Distribution of clubbed Knowledge Products (Handbooks, Manuals, Guidelines etc) being accessed by responding stakeholders for various focus areas

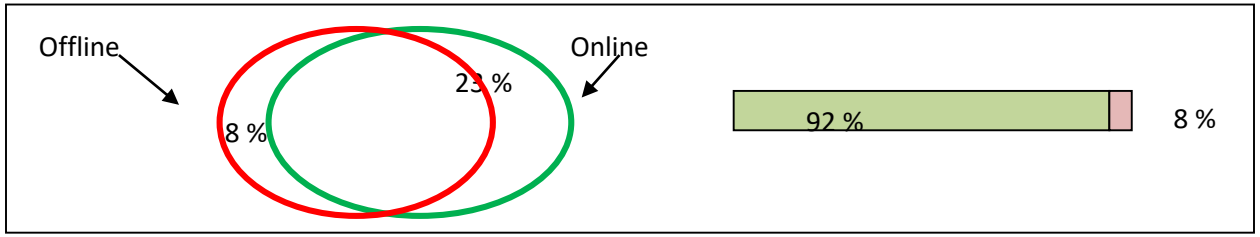


Effectiveness of indicated commonly used KPs

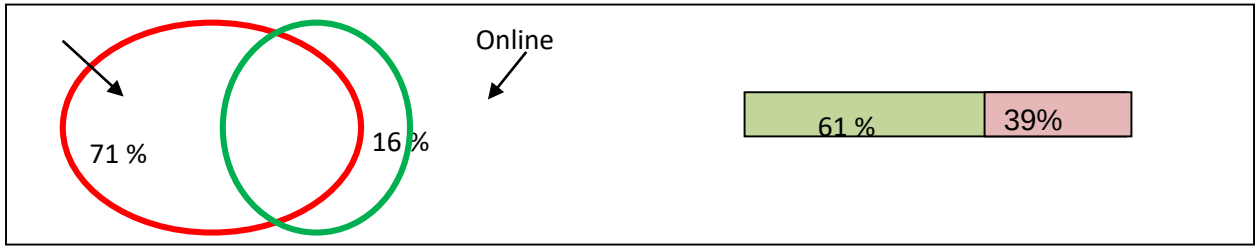


Accessibility of indicative commonly used KPs

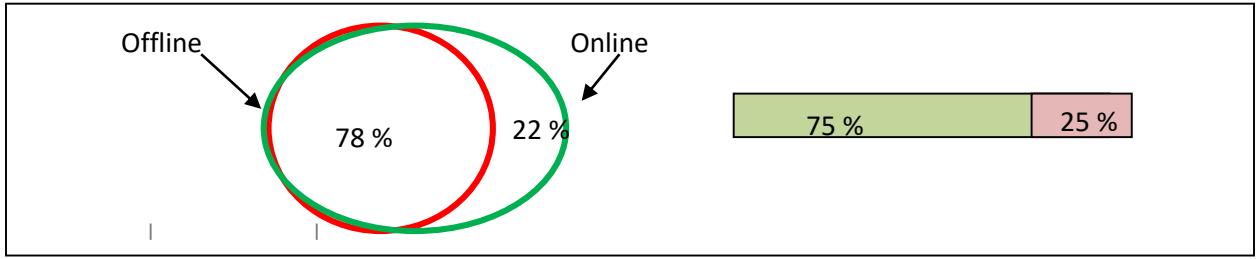
1.Guidelines/Manuals



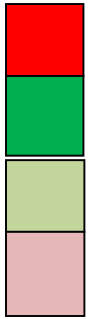
2.Handbooks



3.Good Practice Documents

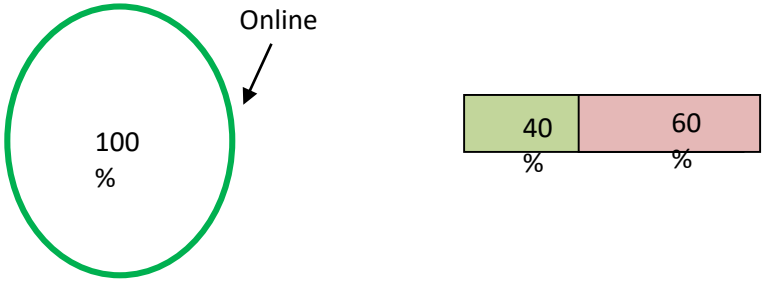


Legends

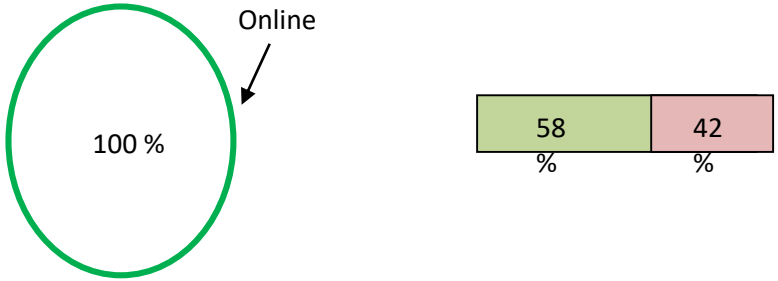


Accessibility of indicative commonly used KPs

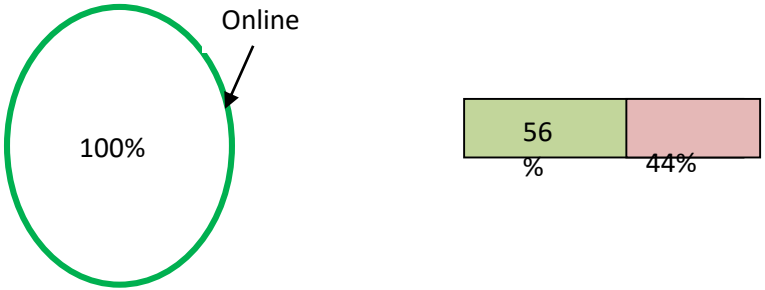
4.Interactive Computer Tools



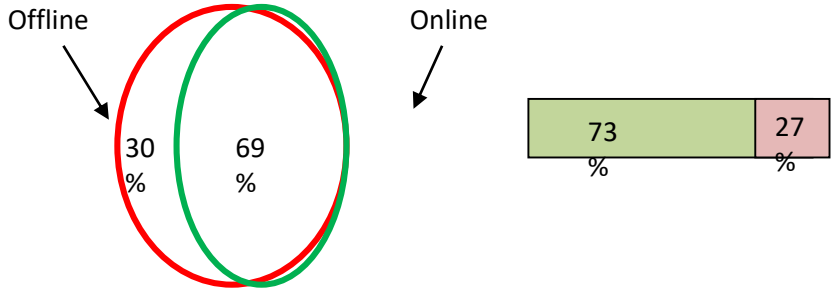
5.Web based platforms



6.Online Courses and forms



7.Training Manuals



Offline
Online

Free of cost
Paid

Feedback from stakeholder meeting Dehradun on 22 October 2019

Attended by:
Member Secretary (UEPPCB), officers of UEPPCB, representatives from PHD Chamber of commerce, CII, IIT, GIZ, Industry association, CETP operator etc.

Feedback received:
1. Knowledge Products (KP) are significantly absent for **the treated wastewater usage** for agriculture use (especially specific to cropping pattern)
2. Scientific papers need to be published on wastewater usage/management
3. KP for Steel/automobile industries for air emission, water consumption, wastewater management etc. in factsheet form of 1-5 pages needed
4. The **factsheets** should be prioritized for about 10 sectors. The factsheet should be colour coded/series for better reference.

5. Studies and KPs on the following are also required:
- Profile of Industrial Area in state
- No. of Green, orange and red industries in the industrial area
- No. and profile of Industries near to river
- Best technology and practices in the world
- Do's & Don'ts for industries
- **Manual for regulatory bodies for field inspection**
- Analysis of industrial water requirement and waste water discharge in Uttarakhand region
- Prepare about 50 brochures (4 to 6 Pages) as case studies under the project
- **Booklet on ZLD, green belt, about CETP case studies, ACT like in Delhi CETP is required**.
- Instrumentation and monitoring requirements and good practices in the form of SOPs
- To launch Diploma courses on CETP/ETP for ITI's as other skill training is for 15 days or short duration

Feedback from stakeholder meeting at New Delhi on 1st November 2019

Attended by:

Senior Officials of CPCB, Representative from CETP operators, GIZ, Industry/ Industry association, Software developers, Consultants etc

Feedback received:

It was discussed to refer to the following international KPs and come out with a similar requirement, if needed, in Indian context:

- Netherland KP on public health damage
- EU practical guide on quantifying harm in actions for damages
- EU Guidelines and standards for wastewater reuse
- EU Guidelines on Integrating Water Reuse into Water Planning and Management in the context of WFD (Water framework directive)

It was also suggested that new KPs are required for:

- Guidelines for third party inspection and standard setting for industries.
- ICT tool or web based platform for monitoring progress or actions taken up by other Ministries in the domain of wastewater
- Self assessment tools for industries
- Web based platform for consolidated data for water consumption and wastewater generation by the industries
- National Web portal for all environmental laws pertaining to wastewater.

Gaps identified in the existing KPs

Gaps identified
1. **Most KPs are on conventional technologies**.
2. Generally, KPs cater to operational level activities and design aspects are moderately treated
3. **Very few KPs are contextualized to Indian situation**
4. A **key concept developed by regulator is ZLD but No Specialised Programme at Online Portal is available** to make effective implementation with respect to technology, costing etc.
5. KPs on combined WW treatment are very few
6. Good practice documents are mostly international and country specific and adaptation process need to be guided or India specific Best Practice Documents needed and with better access / ready availability
7. **Inadequate / insufficient SOPs/Guidelines for Troubleshooting Problems with ETPs.**
8. Inadequate / insufficient Guidelines / Books for RO/FO & MEE Operations and Maintenance
9. Most KPs are aimed at aerobic treatment systems. Other types of treatment systems do not have much resources
10. KPs on combined wastewater treatment, design of packaged treatment systems, tertiary treatment of wastewater and its reuse, Troubleshooting of WWTP are required

Gaps identified in the existing KPs (Contd.)

Gaps identified
11. KPs specific or customized to various stakeholders needed
12. **Guidelines for vetting of design /installation of ETPs / CETPs needed etc.**
13. **State specific Guidelines and Suitable Act / Rules for CETPs establishment and User fee charges formulae and industry responsibility aspects, besides Business Models and funding pattern / O&M aspects related applicability issues are needed to be addressed and benchmarks for service life etc of Civil structures and Electro-Mechanical Equipment needed**
14. No common platform where design / features on WWTPs could be shared
15. User friendliness limited to already knowledgeable personnel
16. Simplified KPs and in Local language in respective States of India are not available.
17. **Sector specific model tender documents for design / development /installation of ETPs/CETPs with suitable detailing of technical requirements beyond treated wastewater discharge norms specifications as well are not available**.

Benchmark international KPs in the form of ICT tools / web based platforms

S.No.	Name	Features
1	Toxic Release Inventory Program	A resource for learning about toxic chemical releases and pollution prevention activities reported by industrial and federal facilities
2	Substance Registry Services	EPA's authoritative resource for information about chemicals, biological organisms and other substances tracked or regulated by EPA
3	The Permit Compliance System	The permit compliance system (PCS) and integrated compliance information system (ICIS) databases provide information on companies which have been issued permits to discharge wastewater into rivers.
4	European Pollutant Release and Transfer Register(E-PRTR)	A Europe-wide register that provides easily accessible key environmental data from industrial facilities in European Union Member States and in Iceland, Liechtenstein, Norway, Serbia and Switzerland.
5	EMAS	A premium management instrument developed by the European Commission for companies and other organizations to evaluate, report and improve their environmental performance
6	eWater source	eWater source, Australia's National Hydrological Modelling platform (NHMP)
7	Burrlioz	Standard software used to derive water quality guideline values for toxicants in Australia and New Zealand
8	HowLeaky	Water Balance Model developed to access the impacts of different land uses, soil types, management practices and climates on hydrology and water quality.

Benchmark international KPs in the form of Mobile Applications which can be developed in India

S.No.	Name	Features
1.	**Wastewater Inflow Calculator**	This inflow calculator app makes it easy for the operator to estimate just how much the expected rainfall will impact their facility. Simply enter the drainage area in square feet and the rainfall amount in inches, and the app estimates the inflow into the sewer from rainfall in gallons.
2.	**Leak Loss Calculator**	Calculates the amount of water lost based on the size of the leak and the pressure of the main, making reporting easier.
3.	**Sizing a Chemical Pump**	Calculates the size of chemical pump needed for your specific application, depending on water flow, dosing requirements and strength of chemical needed.
4.	**Well Disinfection**	Calculates the amount of chlorine bleach needed to disinfect a well.
5.	**Percent Efficiency Calculator**	On Simply entering the influent and effluent lab results for any parameter, including BOD and TSS, the calculator will determine how efficiently the process removed the parameter. Within seconds, wastewater specialists can calculate the efficiency of the wastewater treatment facility or any of the individual process within the plant.
6.	**Disinfection Calculations**	Gives us an easy way for water professionals to calculate tank and pipe disinfection amounts. Simply insert tank or pipe sizes along with the desired ppm, and allow the app to calculate the chlorine dosage
7.	**Well Drawdown**	Water professionals can simply enter the pressure readings from the air line installed with the submersible pump to determine well drawdown and specific capacity.
8.	**Flushing Flows**	Estimating flushing flows has never been easier. This app helps estimate hydrant flushing and flushing devices made from pipe for various reasons when a gauge is not available and accurate calculations are not essential.
9.	**Wastewater Infiltration Calculator**	Wastewater operators will find this tool invaluable for determining the amount of infiltration from various breaks and holes in the lines.

Benchmark international KPs in the form of Mobile Applications which can be developed in India (contd..)

S.No.	Name	Features
10.	**Dosage Calculations for Water Treatment**	Water specialists can make on-the-spot calculations with this app. Various calculations allow you to make the necessary changes in treatment.
11.	**OpCalc –Wastewater**	OpCalc is for Water/Waste Water field operators that need to perform calculations on the go, without an internet connection. This capability will help minimize error and maximize efficiency for calculation related tasks.
12.	**Rural Water Calculator**	This calculator for the rural water community includes every formula and calculation needed for water and wastewater utility operators. Calculation categories include perimeter, area, volume, flow, detention, pressure, head, water loss and flow estimation, concentration, dosage, loading, temperature, weight, common conversions, horsepower, efficiency, F/M ratio, solids, wasting, sewer inflow estimation, chemical calculations, and process efficiency
13.	**AWWA Exam Prep.**	Pass your water operator certification exam with the American Water Works Association (AWWA) Exam Prep study app. Study anywhere, anytime with 2,000+ practice questions and answers.
14.	**Waste Water Reclamation Plant**	A simple and easy-to-use utility that calculates mixed liquor suspended solids (MLSS), return activated sludge (RAS), and waste activated sludge (WAS) for those who work at water reclamation facilities.
15.	**Env Calcs**	This app is designed for engineers, operators, and students to perform calculations such as pipe velocity, pipe diameter, friction head loss, mixer horse power, chemical consumption, chemical dose, residence time, blending concentration and much more. Feature allows users to select from imperial or metric unit system.
16.	**Hydraulics and Waterworks Calc**	Hydraulics Calculator contains 94 calculators and converters that can quickly, and easily, calculate and convert different hydraulics, water works, and civil engineering parameters.

Benchmark international KPs in the form of Mobile Applications which can be developed in India

S.No.	Name	Features
17.	**Wateropolis**	Wateropolis is designed to provide fast and accurate results in any demanding situation. Download their 5 free formulas to have access to key formulas, convertors, and look-up tables. Users can use their email feature to share their results with their colleagues, co-workers, or to save for use later.
18.	**PlutoCalc Water & Wastewater**	Plutocalc is the most complete and popular problem solver suite for water treatment, wastewater, hydraulics, environmental chemistry, and unit conversions.
19.	**Water Treatment Plant Process**	This interactive app is designed to help students learn the properties of water, water treatment plants, water purification, water contamination, and sources of water in an innovative learning method.
20.	**Wastewater Manager**	Wastewater Manager app is designed for wastewater operators, engineers, or anyone else who has a need for easy-to-use mathematical formulas relating to wastewater. The formulas are organized by processes and can be used to assist in daily lab work, process troubleshooting, and more.
21.	**Sewer Design Calculator**	This app is designed for those involved in building or maintaining sewer infrastructure. The app uses “The Manning Equation” to calculate the necessary pipe diameter and slope for a given project. The user inputs the desired flow, length, initial ground elevation, and final ground elevation, and the app uses this data to calculate the slope, diameter, depth, and tractive force needed. The user has the option of working in U.S. units or SI units.
22.	**SAM-1 Smart Aqua Meter**	This app turns smart devices into pH, oxidation-reduction potential (ORP), conductivity/ total dissolved solids (TDS), and temperature measuring meters that not only measure, but also communicate collected data via instant and error-free email.

Need assessment of new KPs

Need identified	Who expressed the need
1. Detailed Case studies on River pollution scenarios, pollution monitoring, river cleaning, rejuvenation and recovery / revitalization	Regulatory body
2. Development **and advancing of India specific Water Quality Index** as a framework and methodology for implementation across regions covering surface and ground water regimes	Regulatory body
3. Sustainable Portals / websites / Transportals etc., with deeper integration of possibly Artificial Intelligence application and Machine learning / data mining algorithms for comprehensively generating Technology options, addressing industry and stakeholder needs on specific range of wastewater management issues, addressing and providing end to end solutions via an open platform for bringing in multi-country inputs on technology options/guidance, reflecting India specific needs and indicators etc. The economics and relevance of such platforms should be driven by the beneficiaries and their business model structures	Domain expert
4. Self certification platforms for engineers and operators and wastewater professionals and availability of their databases for engagement by industry and regulatory bodies	Industry
5**. Real time incidence response frameworks building** on online monitoring networks concerning wastewater related emergencies in the context of chemicals and toxics releases, pollutant load factors, floods and disaster impacts assessments and related recovery systems including mechanisms of strengthening additional real time data needs incorporation etc.	Regulatory body / industry
6. **Training module for induction of fresh appointees** with a Identified training Institute	Regulatory body / designers/ technology providers

Need assessment of new KPs (contd.)

Need identified	Who expressed the need
7. Costing elements and indexations with respect to design of ETPs / CETPs	Designer / Investor
8. Comparison amongst alternatives based on site specific conditions (with range of conditions and parameters accounted for)	Designer / Investor
9. Electromechanical detailing and equipment descriptions and alternatives	Designer / Academician
10. **O&M Manuals and worksheets and usage** features	End User (Industry/ CETP/ETP)
11**. Models with respect to revenue and cost benefits** (enterprise / society level)	Bidder/ Investor
12. Sector specific features / key differentiators or focus elements highlighting unit specific and cluster specific treatment approaches, design and outcomes	Designer / consultant/ Academician
13. **EIA requirements / Environmental Clearance aspects and modeling, including for river and sea water discharges of treated effluents**	Regulatory body / consultant
14. Solved numericals and Question / Answer banks for designers of different stages of knowledge building	Designer / Academician
15. Case examples and case studies focused KPs : (regarding successes / failures / upgrades and redesign and also covering tendering elements and cross references) .	End User (Industry/ CETP/ETP)
17. Industry / Sector specific KPs and guidelines are required. Sector specific features / key differentiators or focus elements highlighting unit specific and cluster specific treatment approaches, design and outcomes	End User (Industry/ CETP/ETP)
18. **Advanced Treatment Focused Manuals (e.g electro chemical treatment processes, thermal desalination, EDR etc.)**	Designer / End user

Need assessment of new KPs (contd..)

Need identified	Who expressed the need
19. Establishment of Pilot Plants and Demonstration Units for different technologies in WWT and Training Plans related KPs	Academician/ consultant
20. Softwares required for the range of the domain (e.g. for drainage there is WaterCad / Watergem / SewerCadetc being made by Bentley but access is inadequate and very few trainers in this domain).	Technology provider
21. **RO/FO/MEE Operation and troubleshooting**	Technology provider / End user
22. Standards Development (Linking to Output 1 – Legislative or norms perspectives) and Load based standards	Regulatory Body / End user
23. Guidelines towards prevention and control and detailing water auditing procedures	Regulatory Body / End user / consultant
24. **Energy efficient Treatment Systems**	Designer / Technology provider
25. Specific treatments like Ammonia removal, Cyanide removal, heavy metals removal: Standardized Methods needed.	End user
25. Utilization of Solar power in effluent / sludge treatment	Academician/ consultant
26. **Comprehensive Water Quality Index** integrating various parameters (to also include linkage with GIS systems and geo – referencing and GIS based Governance) or Geo-Mapping on different parameters (by Physical monitoring for surface and ground water as well as Satellite imagery e.g. for Rivers)	Regulatory Body / End user / consultant
27. **Heavy Metal Pollution Index Development related KP**	Regulatory Body

Measures Suggested & recommended for strengthening of knowledge products

Existing Knowledge Product

- To maximize the outreach of knowledge products , **digitization of all the knowledge products** may be a good alternative
- Web based centralized database can be created for all the existing and upcoming KPs wrt industrial wastewater management
- The KPs can be classified under various identified domains of industrial wastewater management.
- The centralized database may have the provision of membership fee (one time / annual) for accessing all the KPs and eventually making it sustainable.
- Strengthen the various law portals by creating a National Law portal for all compiled rules, regulations, gazette notifications, standards, compliance requirements, penalties

New Knowledge Product

- Advanced portal for water quality data analysis
- A **networking portal** for all stakeholders may be developed for knowledge and experience sharing amongst all wrt to pollution prevention / mitigation, trouble shooting of wastewater treatment plants etc.
- Create web based platform for **data integration and correlation of progress / initiatives made by various ministries / bodies**
- **Create mobile applications for all utility based knowledge products**, eg O&M/ SOPs/ online monitoring/ designing/ calculations/ audit procedures

Priority list of KPs to be Strengthened / Developed for Indian Scenario

Strengthening of:

1. Existing web based portal **ENVIS** for compiled database of all existing knowledge products
2. Existing water quality portal – **India WRIS** by Ministry of Jal Shakti**.** Incorporating water quality data from industries and provision for data analysis / interpretation / integration

Development of:

S.No	Knowledge product to be developed on	Format	International Benchmark KP
3	Field inspection guideline/ checklist for regulatory bodies	Guideline / mobile application	-
4	Guidelines for online monitoring mechanism (CPCB guide exists, published in July 2018) and focused on instrumentation	ICT	Review of process and performance monitoring techniques applicable to large and small scale wastewater recycling systems, Australia
5	Operation , maintenance, trouble shooting and monitoring of wastewater treatment plants / sludge management	Manual / mobile application	QR Code , Germany
6	Imperial approach / calculation to calculate the extent of damage caused by pollution	Manual	Practical guide of quantifying harm / public damage , European commission & Netherlands
7	Treated water / process reject water reuse applications bases on its quality	Guideline /mobile application	Minimum quality requirements for reused water in the EU
8	Online course/ training material for wastewater professionals	Online course /ICT	IHE Delft, Institute for Water Education Netherlands

1. Knowledge portal – ENVIS

- Environmental Information System on providing environmental information to decision makers, policy planners, scientists and engineers, research workers, etc
- ENVIS has comprehensive network & has been designed as the National Focal Point (NFP) for INFOTERRA, a global environmental information network of UNEP.
- this platform can be utilized for larger dissemination of existing knowledge products.
- Provision for feedback on any KP may also be considered.

2. Water quality portal – India WRIS

- Exhaustive data available with respect to water quality of surface water, ground water, river basins etc.
- Data of industrial water consumption, wastewater generation can also be added
- Data of water harvested by various means can be added
- Provision for data analysis, interpretation and integration may be looked into.

3. KP on field inspection guideline/ checklist for regulatory bodies

- **Guideline / mobile application** on field inspection of wastewater treatment plants by regulatory bodies, where in you can feed the data during inspection and instant report will be generated . The checklist to include aspects like:

1. Details of the plant – ETP/ CETP, capacity , Technology, design considerations, type of effluent it is catering to etc.

2. Performance – Capacity utilization, inflow v/s outflow, inlet / treated effluent characteristics as per last available records, performance of unit operations

3. Control of operational parameters (pH, DO, F/M, SVI, ΔP across filters, sludge recirculation ratios etc.)

4. Records / log books to be checked and values to be recorded

5. Sludge management – Quantity, characteristics, storage and disposal mechanism

The field inspection report will be instantly generated and the sampling and analysis values will subsequently validate the report.

4. KP on guidelines for online monitoring mechanism

- Guideline and **ICT tool** for online monitoring mechanism to include:

1. Data intake which is **Complete, reliable and authentic**
2. Parameters that should be online monitored, co-relating parameters like Ph value to be recorded along with temperature
3. Details of instrumentation, eg. Type of sensors / analyzers/ camera to be used, limitations of sensors
4. calibration of instruments / calibration frequency
5. operational parameters to be recorded during online monitoring
6. Trend analysis, Red alert for any failure

5. KP on Operation , Maintenance, Trouble Shooting and Monitoring of wastewater treatment plants

- Comprehensive Manual/ mobile application on O&M, Trouble shooting and monitoring of wastewater treatment plants including all aspects of:

1. SOPs of all unit operations / equipments including the schedules of preventive maintenance schedules & corrective maintenance measures

2. Operational control parameters (pH, DO, F/M, SVI, ΔP across filters, sludge recirculation ratios etc.)for achieving the treatment efficiencies

3. Improving energy efficiency of the overall plant

4. Details of dosage of chemicals, coagulant / flocculent to be added wrt wastewater characteristics subject to actual treatability studies

5. **Guideline for sludge management, quantity , characteristics, parameters to be analysed, disposal procedure and norms**

6. Trouble shooting of unit operations / equipments during operational failures, system revival after breakdowns, re-commissioning of plant and its stabilization etc..

7. Record keeping details (online/ offline), accident reporting, data to be monitored, frequency of sampling, SOPs to be followed for analysis

8. Details of physical, online and real time monitoring

6. KP on empirical approach / algorithm to calculate the extent of damage caused by pollution

- Manual to calculate the extent of public damage to include aspects like::

1. Methods for establishing infringement and non infringement scenario
2. Techniques for estimating the price or other economic variable in the non- infringement
3. Simulation models, cost / finance based methods of analysis
4. Quantifying the harm caused by volume effect
5. Quantifying harm and compensation aspects

7. KP on treated wastewater / process reject water reuse applications based on its quality

- Guideline / software / mobile application , where in values of treated waste water characteristics shall indicate its suitability for reuse in primary / secondary applications like:

  1. Landscaping / horticulture / agricultural usage specific to cropping pattern

  2. Process water in industries

  3. Flushing water in water closets

  4. Cooling tower make up water

  5. Floor washing

- Extent of improvement/ further polishing required to a specific type of treated water to enable its utility in various applications

8. KP on online course/ training material for wastewater professionals

Online Skills Course on Wastewater Treatment for Technicians of ETPs/CETPs	
Objective	Online training system for skills development of the technicians and operators of the industrial wastewater treatment plants
Scope	• Online course to be certified by NSDC/SCGJ • Includes lectures, videos, interactive learning tools, quiz, practical work • Certificate of qualification on passing the SCGJ examination
Benefits	• Flexible and adaptable modules customised to different categories of technicians (RPL, Full scale modules) • No need to be absent from the workplace • Industries can employ trained manpower or upgrade the skills of the existing staff • Helps improve operations of ETPs/CETPs and reduce pollution
Beneficiaries	• Over 1,30,000 technicians and operators of ETPs/CETPs
Development	Proposed to be developed locally with technical support from a German Expert
O&M	To be operated by SCGJ

Resource Efficiency & Sustainable Consumption & Production – Output 5 SEIP II

Knowledge products already developed or existed:

- COINDS (Comprehensive industry document series, 54 sectors; such as stone crusher, ceramics, cement, POP, hot mix, pickling, small paint, brewery etc.) – CPCB with supporting institutions including NPC
- E textile toolbox (UNIDO / Veitnam cleaner production center/ India NCPC)
- Manuals on synthetic textile, pesticide formulation, agro based pulp& paper (UNIDO & NPC under DeSIRe project)
- Promoting resource efficiency in Small & medium enterprises (PRE-SME) toolkit (UNEP)
- Cleaner production toolkit (UNIDO)
- Waste minimization case studies compendium (MoEF&CC / NPC)
- Booklet on waste minimization circle project and training manual (MoEF&CC / NPC)
- WMC newsletter series (MoEF&CC / NPC)
- Green productivity demonstration project reports (APO / NPC) in Dye & dye intermediate sector, edible oil sector etc.
- Green product innovation incubator (UNIDO) and case studies
- Lean manufacturing programme case studies – MSME/ NPC

Resource Efficiency & Sustainable Consumption & Production – Output 5 SEIP II

New Knowledge products needed:

- upgraded / revised COINDS for 54 sectors and for new sectors
- Electronic toolboxes (combination of existing research papers, project initiatives, success stories etc.) for a wide range of sectors
- Ecolabeling framework and harmonized database for India and other countries
- Eco product database (country wise, product wise, sector wise)
- Green finance for SCP and its framework, schemes, incentives, standard RFPs etc.
- Policy compendium on SCP (National & international)
- Sectoral case studies and comparative insights on benchmarks for resource efficiency
- Circular economy framework and related projects and schemes and MFCA (material flow cost accounting) initiatives and Green lean programme
- SCP related awards (criteria, past assessments and insights)
- SCP related research calls, frameworks and design components

Thank You !

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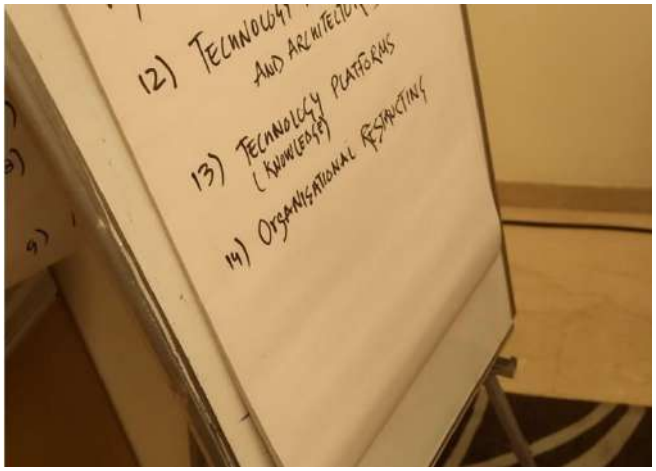
Annexure 3: Glimpses of the event



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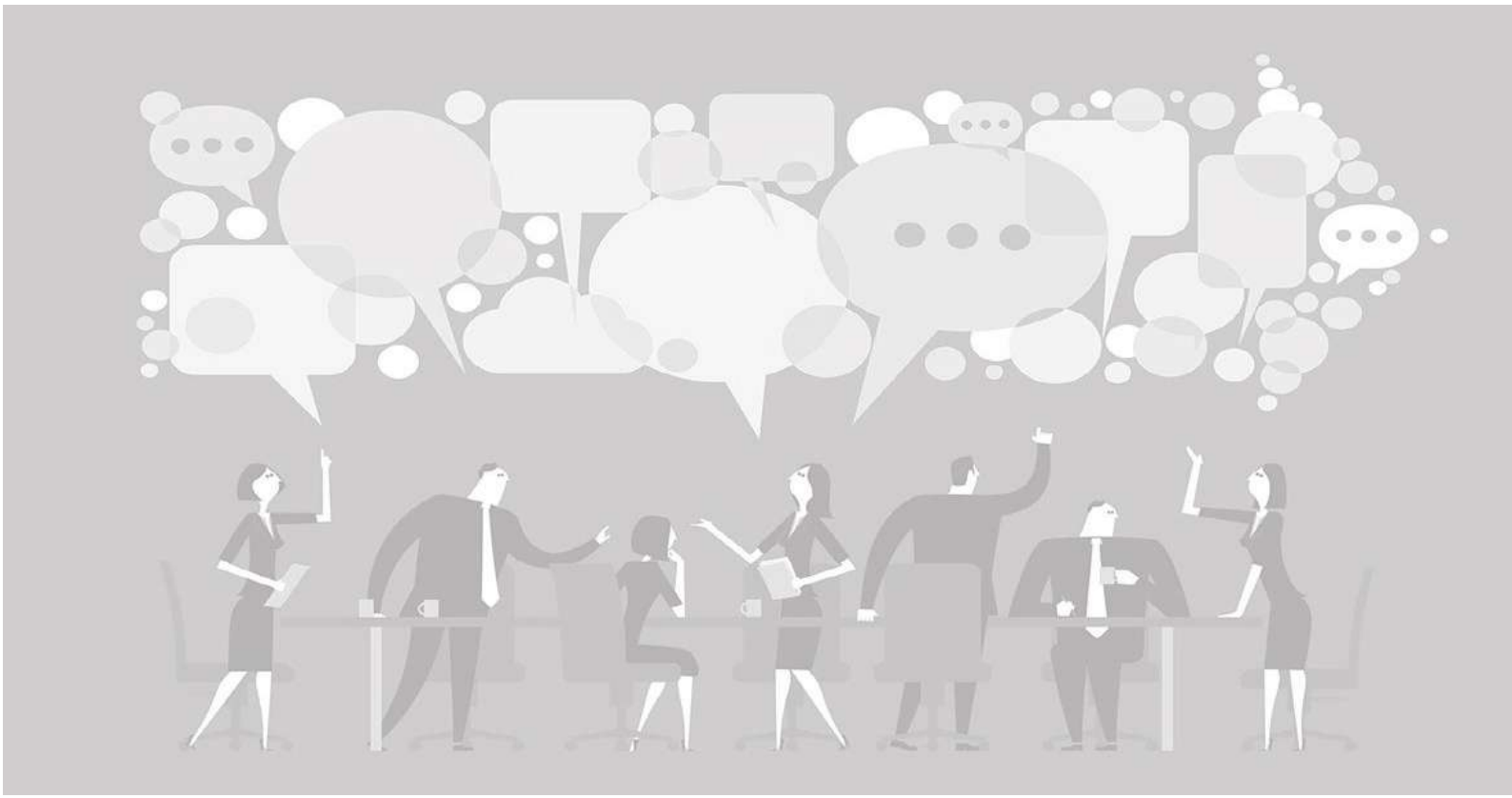

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