



**Potential and Validation  
of Sustainable Natural & Advance Technologies  
for Water & Wastewater Treatment,  
Monitoring and Safe Water Reuse  
in India**

**Type of action:** Research and Innovation action (RIA)  
**Project duration:** 48 months (01.02.2019 – 31.01.2023)

**Deliverable D7.2  
2<sup>nd</sup> Report and Publication of the PP Working Group from each  
Chapter**

Version: 1.1

**Work package:** WP7 – Capacity building & organisational development:  
EU-India cooperation

**Responsible partner:** 5- AIMEN

**Due date of deliverable:** 31.01.2022  
**Actual submission date:** 31.01.2022

**Nature of Document:** Report

Dissemination Level:		
PU	Public	X
CO	Confidential, only for members of the consortium (including the Commission Services)	
CI	Classified, information as referred to in Commission Decision 2001/844/EC	

	This project has received funding from the European Union’s Horizon 2020 research and innovation programme under <b>grant agreement No 821410</b>
---	---

## Document change history

<b>Version</b>	<b>Date</b>	<b>Author</b>	<b>Description</b>
1.0	15.02.2022	AIMEN, TTZ, Seecon	Strategy Development Workshops and consolidation of 1 <sup>st</sup> Version
1.1	31.01.2022	TTZ	Adjustment and submission

## Table of content

<b>1. EXECUTIVE SUMMARY.....</b>	<b>4</b>
<b>2. INTRODUCTION AND OBJECTIVES.....</b>	<b>5</b>
<b>2.1. Organization of community of practices:.....</b>	<b>5</b>
<b>2.1.1. 1<sup>st</sup> CoP Organization: .....</b>	<b>6</b>
<b>2.1.2. 2<sup>nd</sup> CoP Organization: .....</b>	<b>7</b>
<b>3. OUTCOME OF THE 1<sup>ST</sup> COMMUNITY OF PRACTICES .....</b>	<b>8</b>
<b>3.1. Water potabilization and rainwater harvesting - 1<sup>st</sup> CoP: .....</b>	<b>9</b>
3.1.1. Participants.....	10
3.1.2. Results of the CoP.....	11
<b>3.2. Water Reclamation - 1<sup>st</sup> CoP:.....</b>	<b>12</b>
3.2.1. Participants.....	12
3.2.2. Results of the CoP.....	12
<b>3.3. Sensors and High-resolution management - 1<sup>st</sup> CoP .....</b>	<b>14</b>
3.3.1. Participants.....	14
3.3.2. Results of the CoP.....	15
<b>4. OUTCOME OF THE 2<sup>ND</sup> COMMUNITY OF PRACTICES.....</b>	<b>17</b>
<b>4.1. Water potabilization and rainwater harvesting – 2<sup>nd</sup> CoP: .....</b>	<b>18</b>
4.1.1. Participants.....	18
4.1.2. Results of the CoP.....	18
<b>4.2. Water Reclamation – 2<sup>nd</sup> CoP:.....</b>	<b>20</b>
4.2.1. Participants.....	20
4.2.2. Results of the CoP.....	21
<b>4.3. Sensors and High-resolution management – 2<sup>nd</sup> CoP .....</b>	<b>23</b>
4.3.1. Participants.....	23
4.3.2. Results 2 <sup>nd</sup> CoP .....	23
<b>5. RESULTS OF THE COPS.....</b>	<b>25</b>
<b>6. NEXT STEP AND FURTHER LINES .....</b>	<b>26</b>

## 1. Executive Summary

The present report collects the information of the Community of Practices carried out in the PAVITR project. A total of 6 workshops have been organized in which 10 partners took part in different topic and more than 17 experts participated actively.

The workshops provided valuable information about the global vision of the partners involved regarding the water and wastewater situation and evaluated the problems and barriers observed as well as potential solutions in three topics:

- water potabilization and rainwater harvesting,
- water reclamation and
- sensors and high-resolution management.

The results provided common views on the problems associated with the regulatory frameworks, the collaboration EU-India and the necessity to work on a long-term perspective. Different solutions were offered, and potential stakeholders were identified.

## 2. Introduction and objectives

The objective of deliverable D7.2 is to summarize the two first meetings organized in the **public private working groups (PPWG)** of water professionals from EU and India for the knowledge and experience exchange. During 2021, PAVITR developed the community of practice (CoP) of the three subjects selected to include in the PPWG: Water potabilization and rainwater harvesting, Water Reclamation and High-resolution management.

The main objectives of these CoPs were to facilitate the opinions' exchange about the common problems detected in the Indian water sector from the distinct perspective provided by the different professionals involved in the PPWG. Furthermore, the barriers to overcome and the potential solutions which could be necessary to apply to face the problems were discussed.

Additionally, the 1<sup>st</sup> and 2<sup>nd</sup> CoP were used to define potential third party- members which could be interesting to contact for next steps, as well as to evaluate if the methodology selected was successful to reach the goals expected at the beginning of the organization of task 7.1.

Finally, it was considered along with the development of both CoPs the possible synergies with other tasks of different working packages. The idea was to continue to establish the broader vision of each CoP to collect information regarding, not only the necessities of the WP7, but also information relative to the proposed research clusters (WP2), the impact of this strategy on the exploitation plan (WP4), influence on the regional management (WP6) or connexions with the dissemination strategy (WP8).

### 2.1. Organization of community of practices:

The organization of a **community of practice for different topics** was employed due to their demonstrated effectiveness to discuss technical aspects, identification of problems to overcome, improvements required, potential solutions to concrete problems. These CoP independently throughout the year, sharing information, discussing various aspects via online-events, and generating recommendations and conclusions for each topic. All this information is explained in detail in the 1<sup>st</sup> Report and Publication of the PPWG (submitted in April 2021 as D7.1).

All the PPWG events held so far were organized by AIMEN and SEECOM with the collaboration of TTZ and the support of all the partners involved. All the CoPs were held online by different platforms: MS Teams, Zoom, etc. Additionally, it was employed different IT tools, such as MS PowerPoint and the app MURAL, to facilitate the communication and exchange between moderators and participants. In particular, the MURAL app was used as an interactive tool that facilitated the participation of the partners interacting with the moderators and adding sticky notes to a general board of discussion.

In Figure 1 it could be seen a screenshot taken in one of the CoPs celebrated. It could be seen as this tool allowed to participate remotely the different partners (Visiting...) writing on sticky notes their comments into a general canvas managed by the moderators (Simon Joncourt, in this case). With these tools, it was compensated the issues related to the online events and the passiveness of the participants. The result was successful, and the participants evaluated positively this event.

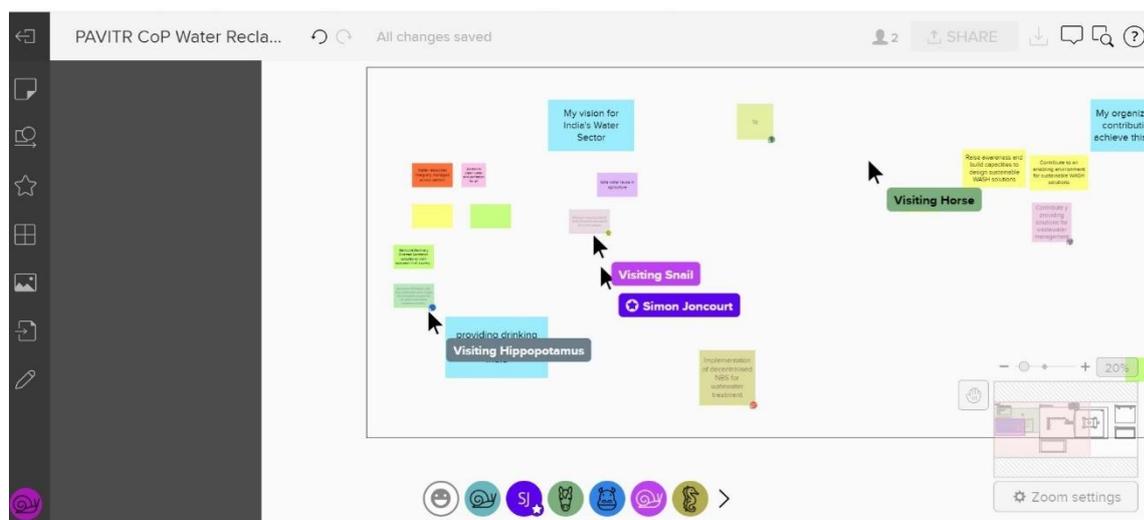


Figure 1: The use of the Mural app allowed to the partners to interact in the workshop adding their ideas and opinions in sticky notes organized by the moderators. Screenshot taken during the development of a CoP.

### 2.1.1. 1<sup>st</sup> CoP Organization:

The 1st COP presented the next organization scheme, as is depicted in the Figure 2

#### 1. Establishing a common vision:

The initial task developed consisted of establishing a common point of view about the problems in each specific topic. The partners involved will answer questions related to the ideal scenario to their sector for allowing them to thrive, the interest they have in the EU-India collaboration, opportunities observed and/or desired.

#### 2. Identifying barriers

Secondly, will be addressed questions to identified potential problems with the government restrictions, technical aspects, social difficulties, adverse interests of private companies, etc.

#### 3. Prioritizing barriers

It will be ordered the importance of the barriers detected, in terms of relevance and urgency, according to the interest of each one. Consequently, a list of the most relevant barriers and the order of actuation on them will be defined. Indirectly, it will be identified the agents involved in each barrier and the audience to reach in future workshops, to show the potential problems identified in each sector.

#### 4. Outlining next steps

A summary of the event could support establishing the hotspot of the next event.

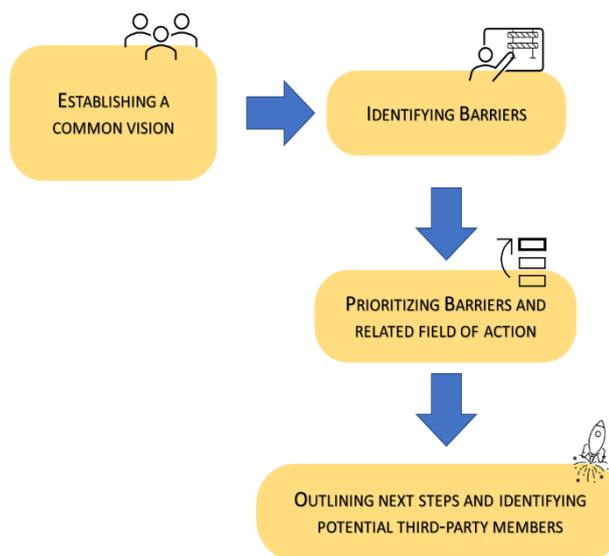


Figure 2: Structure of the 1st meeting

### 2.1.2. 2<sup>nd</sup> CoP Organization:

The 2<sup>nd</sup> CoP was adapted to the information gathered in the first CoP and the scheme is shown in Figure 3

1. *Validation of barriers: Field of Actions.*

The first step was to agree with the barriers selected and prioritized in the previous CoP and try to join them by field of action.

2. *Potential solutions*

In these fields, it was studied and evaluated different solutions and trying to establish their viability in technical and economic aspects.

3. *Key Stakeholders to involve*

As the last step, identification of potential stakeholders was carried out in order to centre the searching of potential third-party to include in the discussion in future events.

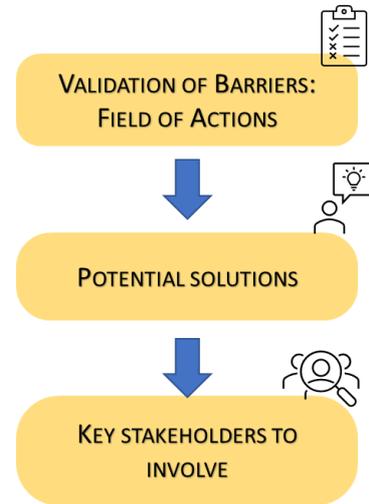


Figure 3: Structure of the 2nd CoP

### 3. Outcome of the 1<sup>st</sup> Community of Practices

The 1st CoP was held in April and May 2021, and it was venue on online platforms: MS Teams and Zoom. The agenda followed in the 3 Cop was similar and it was depicted in Table 1.

Table 1: Common Agenda of the three workshops of the 1st Community of Practices

Duration	Activity	Outputs	Material to prepare
5 min	<p><b>Check-in and Welcome</b></p> <p><u>Process:</u> Participant's log-in, get welcomed, tackle connection issues if needed.</p>	-	-
15 min	<p><b>Introduction</b></p> <ul style="list-style-type: none"> <li>- Introduction (8min)</li> <li>- Q&amp;A, Suggestions (7min)</li> </ul> <p><u>Process:</u> The facilitator kicks-off the session, gives an official welcome to all and introduces the participants to the vision, purpose and methodology of the CoP and CoP Clusters. It is important to highlight the fact, that the CoP should make the lives of the participants easier and that at the third meeting will incorporate decision- and policy-makers that can make a change. Participants are invited to ask questions and make suggestions.</p>	- CoP & CoP Cluster presentation	- PPT Introduction
30 min	<p><b>Establishing a common vision</b></p> <ul style="list-style-type: none"> <li>- Introduce Mural (5min)</li> <li>- Explaining the activity (5min)</li> <li>- Creating the inputs (10min)</li> <li>- Discussing the inputs (10min)</li> </ul> <p><u>Process:</u> Participants are invited to formulate their strategic interest regarding the future of India's wastewater management sector in the context of their work. The vision should be free of constraints in reality and represent the "dream" of each participant regarding how their organization ideally would perform in India. For this purpose, the participants have 5 minutes to write down key words or a short statement (on a content block) outlining their strategic goals as an organization in India's wastewater sector. Subsequently, each participant explains what he has written down to the rest of the participants. The facilitator clusters the statements according to their focus, scope, and time horizon. To wrap-up, the facilitator points out commonalities in the statements and highlights interesting or surprising insights. Before moving on, the facilitator explains that these inputs will be used to tailor a "vision statement" for the cluster to be validated in the next cluster meeting.</p>	- Inputs for tailoring the vision statement of the Cluster	- Canvas for inputs on the vision statement
50 min	<p><b>Identifying barriers</b></p> <ul style="list-style-type: none"> <li>- Explaining the activity (5min)</li> <li>- Mapping the barriers (30min)</li> <li>- Discussion of results (15min)</li> </ul> <p><u>Process:</u> With reference to the established vision, the facilitator acknowledges the barriers that currently prevent the participants</p>	- Map of barriers	- Canvas for mapping barriers

	from achieving their goal. Participants are invited to map out all the constraints that currently are preventing them from reaching their vision. Each participant is asked to map at least 5 barriers (using one red content block per barrier). At the end, the facilitator leads the discussion of the outcome: Are there barriers that have been mentioned by everybody? Are there commonalities between the different barriers? Any barriers missing?		
35 min	<p><b>Prioritizing barriers and related fields of action</b></p> <ul style="list-style-type: none"> <li>- Explaining the activity (3min)</li> <li>- Voting on barriers (15min)</li> <li>- Discussing the results (12min)</li> </ul> <p><u>Process:</u> The participants are asked to rank the barriers using coloured dots to vote: a) What are the most crucial barriers in terms of the negative impact they have? b) Among these most crucial barriers, what are the barriers that most likely can be addressed within the frame of COP (referring to the overall methodology of the COP)? The facilitator leads the discussion of the results and validates them asking the participants critically: Do the results reflect the participant’s intuition and do they feel confident and motivated to tackling the tasks prioritized during this activity?</p>	- List of prioritized barriers	- Barrier voting material
15 min	<p><b>Outlining next steps and identifying potential third-party members</b></p> <p><u>Process:</u> The facilitator concludes the session by explaining the next steps and highlighting the facts that the Cluster will focus and preparing an input for the COP (plenary session) at the end of the year that outlines possible approaches to tackling the prioritized barriers. The facilitator asks the participants if they think that for the next Cluster meeting, additional actors should be invited to meaningfully discuss potential solutions to the prioritized barriers.</p>	- List of potential participants to invite for the next meeting	- Space to collect inputs from participants

In the beginning of the event, as a first CoP developed in each topic, it was reserved some minutes to introduce the PPWG, the CoP and the main objectives pursued with the development of this task. After that, it was started the dynamization of the partners to facilitate the discussion about the common vision of the problems identified. Afterward, the identification of barriers was observed for each participant, according to their experience and in accordance with their area of work. Next, the prioritizing of the barriers. Finally, time for conclusions was reserved.

### 3.1. Water potabilization and rainwater harvesting - 1<sup>st</sup> CoP:

This topic is included because of the importance of ensuring pathogens-free water for the population and the necessity of enhancement of the treatment systems to provide disinfected water to rural areas of India or remote villages, schools, hospitals, and buildings.

### 3.1.1. Participants

The CoP took place on May 5<sup>th</sup>, 2021, and in it took part the next partners:

- Participants: AUTARCORN (Philip Otter), KRETA (Max Odenthal).
- Moderators: SEECON (Simon Joncourt), AIMEN (Santiago Gómez Cuervo).

The main problem detected in this 1<sup>st</sup> CoP was the absence of Indian partners. It led to a partial vision of the problems, obtaining as results the European perspective of the problems detected. It is a crucial point to consider in the next CoP.

In next images, it could be seen two screenshots taken during the workshop:

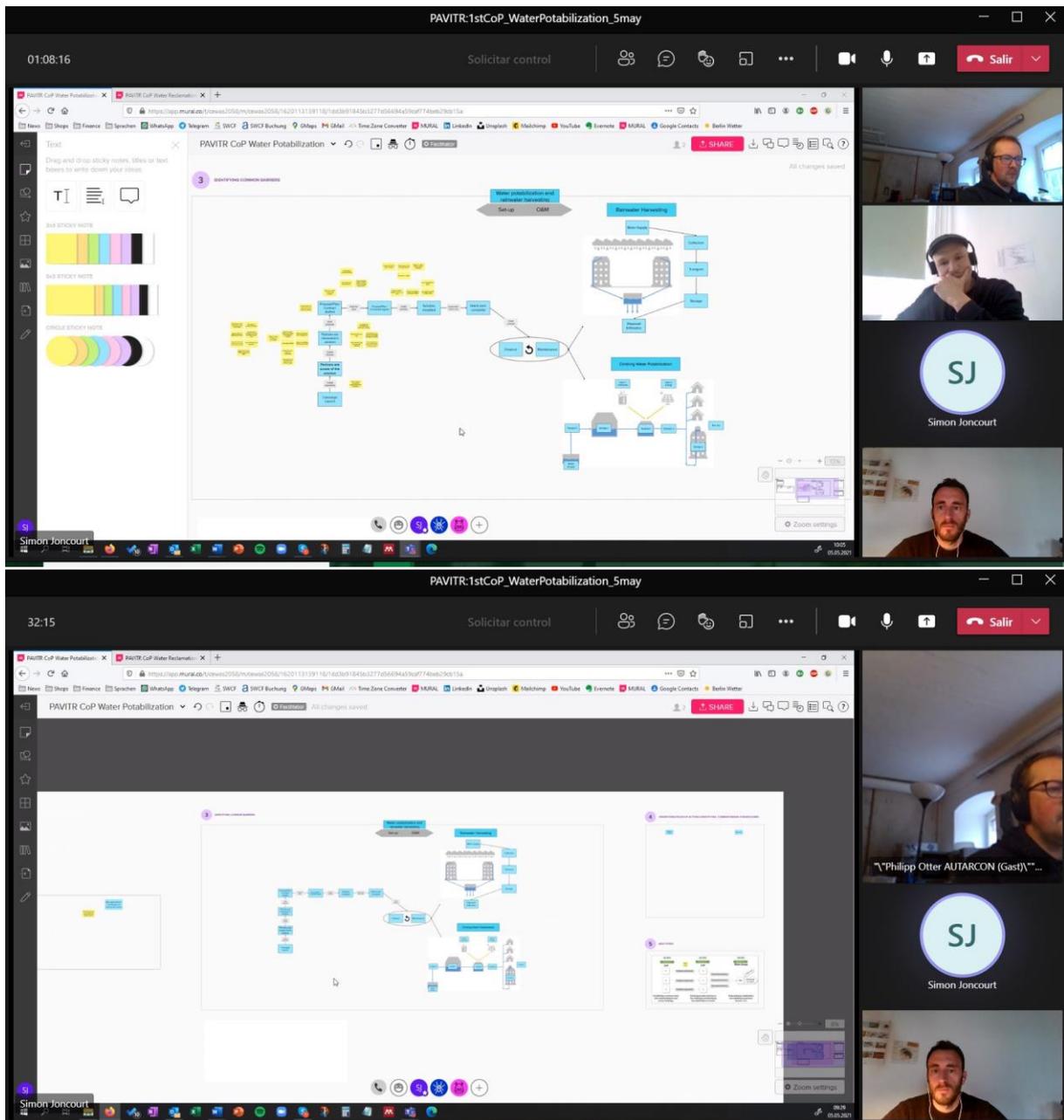


Figure 4: Screenshots captured during the 1st Water disinfection and Rainwater harvesting CoP

### 3.1.2. Results of the CoP

The partners involved in this CoP (Autarcon and Kreta) present a dilated experience working in projects with Indian partners. It resulted in a rich discussion with interesting information to face the problems and to identify the most common barriers. Next, it is summarized the most relevant results for the different points discussed in the workshop.

- The first activity was to try identifying the most common barriers detected, according to the experience and perspective of each partner. The main barriers detected were related with:
  1. There is a necessity to improve the management of all the water resources across all the sectors.
  2. Government, regional institutions, and water companies should make an effort to improve the management of all the water resources across all the sectors. Especially interesting must be focused on the financing mechanisms, which should be focused on the operation and maintenance and the necessity of maintaining a long-term operation of the units, in order through the monitor and control to data due to inadequate access to data and updated information. A range of cultural and socioeconomic factors reduce planning security for longer-term projects and make it difficult to mobilize resources to increase the durability of installed technologies.
  3. Pricing models related to access to clean water trend to promote the most conventional services instead of sustainable and financially self-sustaining services.
  4. Partnership EU & India tends to require time to find common ground in terms of business procedures and build-up mutual trust. Moreover, the services provided from Europe are too expensive for the market-- Social awareness about the water costs: pay for connection, not for consumption--- Complex and ambivalent institutional set-ups make it difficult to hold local partners accountable. Customers and end-users typically are not used to the smell of chlorinated water, reducing acceptance of the product.
  5. EU partners typically struggle to identify matching local partners for a project lack of a standard for goods.
  
- After the definition of the barriers, next step was to prioritize them for the definition of the field of actions on which to act. Thus, the barriers selected for work on it were:
  1. Financing mechanisms that are more focused on long-term operations. E.g.: volume-based tariffs.
  2. Accountability mechanisms that allow for thriving international partnerships
  3. Lack of enforcement of recommended guidelines: Enforcement mechanisms that allow for longer-term planning security for installation and operation of PAVITR technologies.

## 3.2. Water Reclamation - 1<sup>st</sup> CoP:

This topic is included because water reclamation technologies are promising treatments that are being developed around the world due to their importance in terms of treatment efficiency, cost-effectiveness, and lower maintenance operations. All these characteristics become these technologies as an ideal alternative for small-medium locations/industries and for decentralizing wastewater treatment.

### 3.2.1. Participants

The CoP took place on April 28<sup>th</sup>, 2021, and the participants were:

- Participants: - IRIDRA (Fabio Massi and Riccardo Bresciani), AARUS (Carlos Arias), UPC (Enrica Uggeti), TTZ (Andrés Acosta, Mirko Hanel), BIOAZUL (Antonia Lorenzo), BOKU (Sandra Nicolics), SIU-SIT (Ivanya Addagadra), NEERI (Elsa Sony), AIMEN (Luz Herrero).
- Moderators: SEECON (Simon Joncourt), AIMEN (Santiago Gómez Cuervo).

In this CoP it was low participation of the Indian partners. Although there were active participations of SIU-Sit and NEERI partners, the major contribution to the workshop came from the European perspective.

In next images, it could be seen two screenshots of the event:

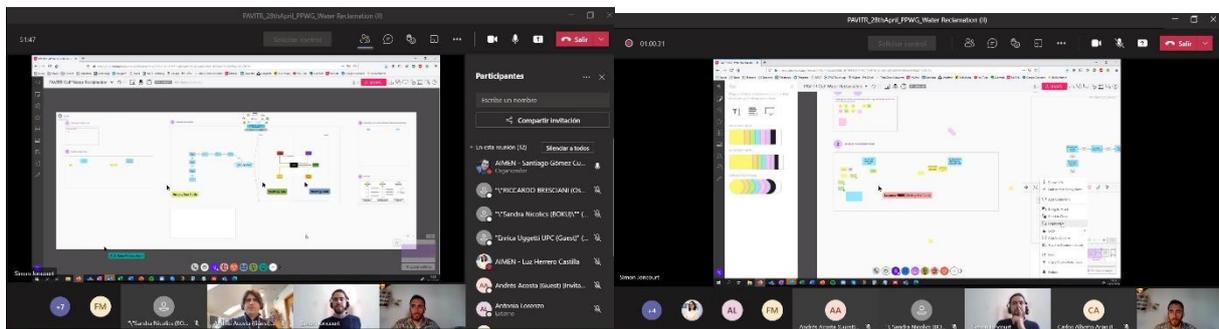


Figure 5: Screenshots taken during the Water Reclamation CoP.

### 3.2.2. Results of the CoP

The participations of the 9 partners in the workshop was very fruitful in terms of ideas and barriers identified for the problems associated with the water reclamation in India. The partners invited, with extensive experience working along with the world in technologies for reuse of water, presented their perspective in the different aspects discussed. Next, it is summarized the most relevant results for the different point discussed in the workshop.

- The first activity in this workshop was related to establishing a common point of view of the problems among the partners in relation to the problems discussed. As result, it was accepted by the participants that:
  1. It is required to provide safe water for human consumption and reuse in agriculture and rural areas. Additionally, it is required the implementation of a

decentralized wastewater system (as the Nature-based solutions) focused on the reuse of the treated water. Furthermore, technologies applied to recovering nutrients from the wastewater should generate an economic interest and not only environmental protection benefits.

- Once there was a common vision of the problem arrived the identification of the barrier which are preventing the achievement of the optimal situation in the water reclamation, according to the experience and perspective of each partner. The main barriers detected were:
  1. There is detected an **important challenge related to International Cooperation and Communication** for the companies which want to establish cooperation with India. The lack of information or the inaccuracy in the information provided is a key point to work in this cooperation method. Moreover, it was identified inadequate access to provide quality materials in India is required to implement/install the technology. Also, it was observed a gap between the required skills to install and operate technologies and the available staff in India.
  2. It was identified the necessity to raise public awareness of the environmental issues in India, as well as the lack of knowledge of the repercussion of these issues.
  3. Also, it was observed an absence of incentives or markets for marketing the recovered products obtained from the wastewater reclamation process.

After the definition of the barriers, next step was to prioritize them for the definition of the field of actions on which to act. Thus, the barriers selected for work on it were:

1. **Public awareness and knowledge** about **the environmental problem** and the necessity of environmental protection actions.
2. Lack of **coherent regulatory framework** that includes **mechanisms and incentives** to promote safe **reuse of PAVITR products**.
3. **Concerning International cooperation and communication:**
  - Requirements of a **common understanding** of doing business of the wastewater and water problem in India
  - Lack of **clear rules for cooperation**
  - Requirements of a promotion of partnerships based on mutual trust, effective communication, gender equity and **inclusiveness**.

### 3.3. Sensors and High-resolution management - 1<sup>st</sup> CoP

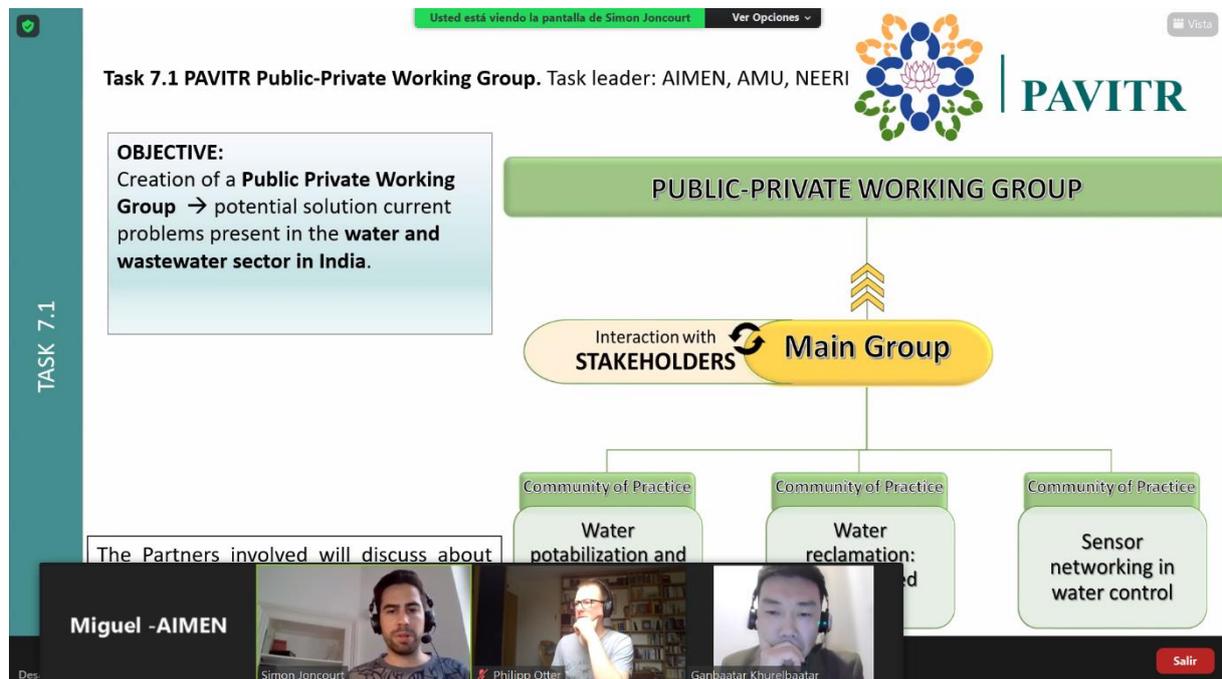
This topic is included in the High-Resolution management Research Cluster and covers the water and wastewater control by sensors and the ALLOWS-GIS tool to organize regional scenario simulations. The idea of the topic is to improve the management, distribution, treatment, and reuse of water and wastewater using innovative control systems based on sensors. The use of sensors is an interesting solution to apply due to the possibility of controlling remotely the water and the wastewater treatment units, facilitating the installation of equipment in remote areas.

#### 3.3.1. Participants

The CoP took place on May 12<sup>th</sup>, 2021, and the participants were:

- Participants: - AUTARCON (Philip Otter), AIMEN (Miguel Placer), UFZ (Ganbaatar Khurelbaatar).
- Moderators: SEECON (Simon Joncourt)

In this meeting’s CoP there was no Indian partner participation, unfortunately. Therefore, the revision of the problems and the barriers identified has a clear European perspective. Next, two screenshots of the event:



The screenshot shows a Zoom meeting interface. At the top, it says 'Usted está viendo la pantalla de Simon Joncourt' and 'Ver Opciones'. The main content is a slide titled 'Task 7.1 PAVITR Public-Private Working Group. Task leader: AIMEN, AMU, NEERI'. The slide features the PAVITR logo and the following text:

**OBJECTIVE:**  
Creation of a **Public Private Working Group** → potential solution current problems present in the **water and wastewater sector in India.**

The diagram on the slide illustrates the structure of the Public-Private Working Group. At the top is a green box labeled 'PUBLIC-PRIVATE WORKING GROUP'. Below it is a yellow box labeled 'Main Group' with a circular arrow icon and the text 'Interaction with STAKEHOLDERS'. Three lines connect the 'Main Group' to three separate green boxes, each labeled 'Community of Practice'. The first box is 'Water potabilization and...', the second is 'Water reclamation:...', and the third is 'Sensor networking in water control'. At the bottom of the screenshot, there is a video call interface with four participants: Miguel -AIMEN, Simon Joncourt, Philipp Otter, and Ganbaatar Khurelbaatar. A 'Salir' button is visible in the bottom right corner.

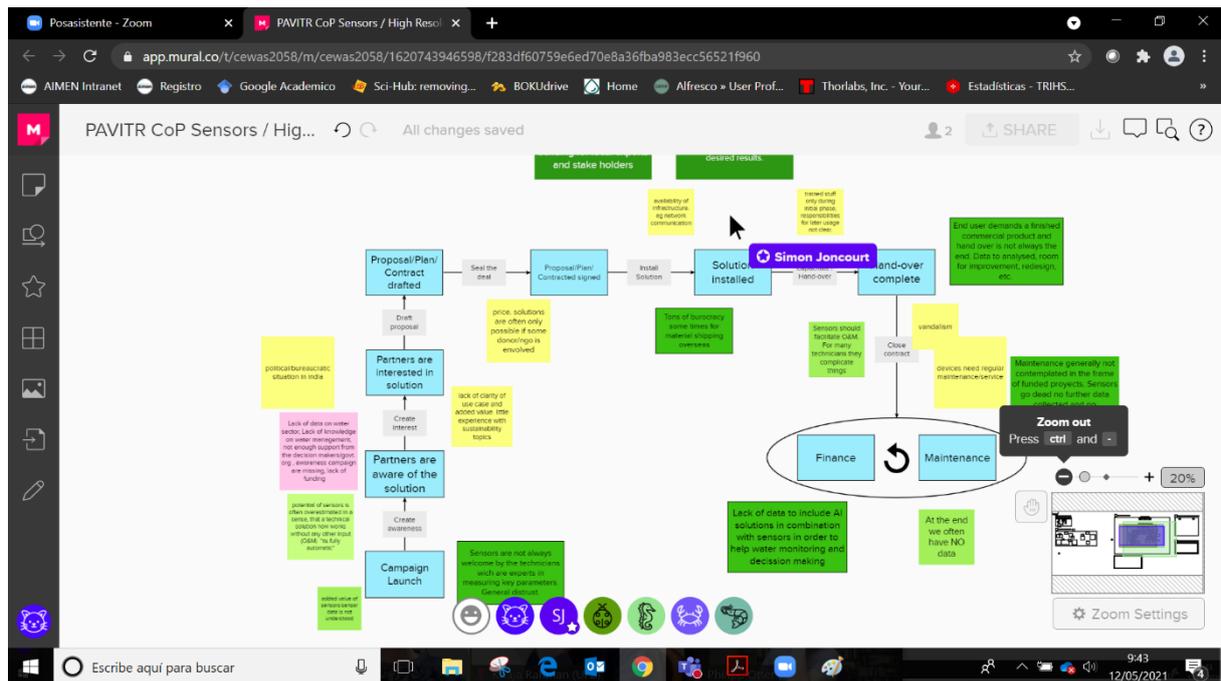


Figure 6: Screenshots taken during the Sensor and High Resolution Management CoP.

### 3.3.2. Results of the CoP

The three partners involved participated actively in the event, which provided a productive discussion about the situation and interesting barriers identified in this field. The topic of sensor and high resolution management offers new opportunities and advantages worldwide known. However, the discussion provided for the experts has laid on table the problems associated with work which have not commonly been identified easily. Next, it is summarized the most relevant results of the discussion:

- Initially, the partners established a common vision of the situation of the sensors and the high- resolution tools focused on the situation in Indian and the particularities present working there:

The partners agree with the necessity of investing in the water and wastewater infrastructure, making especially effort in the monitoring tools -like sensors-, which provide information about the sector situation, and in GIS tools which improve the sector management. The combination of these tools (sensor and GIS) will lead to better decision support systems for appropriate regional planning, select suitable technologies, huge awareness campaign, etc. In this sense, it was commented the problem associated with the costs of the sensors and the difficulties to companies or public bodies to acquire them. It entails, these sensors are only available for donor investors, which usually are responsible for the development of tools for their interests. Finally, it was remarked the importance of trust in more sustainable treatments, as Nature-based solutions, to reduce the impacts on the environment derived from the water and wastewater sector in India.

- After this common view, some barriers were identified as the challenge to overcome for the better implementation of these technologies in the wastewater and water sector. The main barriers detected were:
  - **There is no maintenance of the sensors**, considering fully automatic. Sensors collapse finally and no improvements could be done. Sensors should facilitate the maintenance operations but providing adequate training to the local staff presents some challenges.
  - Technologies provided often do not have an **operator after development**. There are ambiguities related to the responsibilities for the maintenance of the systems.
  - Level of acceptance of staff on the ground can be influenced by **lack of trust in the technology and/or** insufficient training
  - Governments and authorities make complex to ship sensors or tools. There is an excess of bureaucracy for material shipping which implies long periods.
  - No strong market demands. It is a lack of awareness around the value of sensors or decision making tools.
- The next step was to order these barriers according to their impact on the development of the work. Thus, the barriers selected for work on it were:
  1. The unsustainability of projects and collaborations. Requirements of
    - Long-term operations to study the effects or impacts.
    - Financing for O&M and long-term planning.
    - Accountability mechanisms.
  2. Lack of awareness around the value of the sensors and decision tools.
    - The market is not yet mature. There is no interest in the market for this solution.
  3. Requirements of increasing the local capacities to take advantage of these tools.

## 4. Outcome of the 2<sup>nd</sup> Community of Practices

The 2<sup>nd</sup> CoP took place between November and December 2021. In these second meetings, it was present the idea to take advantage of the results obtained in the previous CoP of each topic and try to go further in the discussion, as well as in the interpretation of the problems identified. In this second CoP it was necessary the participation of the Indian partners since the results obtained in the first workshops were clearly influenced by the European perspective. It was considered the validation of these barriers identified from the Indian side was essential to verify them and to bring a more realistic proposal of solutions to the problems.

With this premise, it was organized the 3 CoPs. All the events were the venue on on-line platform, since it is the more efficient way to work according to the situation lived that period derived from the pandemic situation. The online tools employed were like the first CoP

Next, it is described in Table 2 the agenda followed in all the topics meetings for this 2<sup>nd</sup> CoP:

Table 2: Agenda followed in the 2<sup>nd</sup> CoP

Duration	Activity	Outputs	Material to prepare
5 min	<b>Check-in and Welcome</b>	n/a	n/a
10 min	<b>Introduction and Summary 1<sup>st</sup> CoP</b>	- CoP & CoP Cluster presentation	- PPT Introduction
10 min	<b>Validation of Field of Actions detected</b> - Field of actions detected (5 min)	- Inputs for Fields of Action	- PPT Field of Actions
50 min	<b>Potential solutions to this field of actions –</b> Explaining the activity (5 min) - Mapping the solutions (20 min) - Discussion of results (30 min)	- Prioritized approaches/ideas to act	- MURAL
30 min	<b>Key stakeholders to involve</b> - Sharing potential stakeholders interesting to participate (20min) - Prioritizing and discussing (10 min)	- List of stakeholders	- MURAL
10 min	<b>Outlining next steps and close of the session –</b>	- Inputs for planning PAVITR CoP Conference (When/Where/with whom)	n.a.

Initially, it was summarized the results of the 1<sup>st</sup> CoP, as well and validated, with the Indian partners the problems detected in each topic. After that, it was presented the barriers prioritized and the Field of Actions in which it should be working to overcome the barriers. Next, it was time to interact with the experts and it was established diverse groups to identified potential solutions to each barrier in the field of action. Finally, a brief identification of potential stakeholders to involve, trying to order them according to their capacity to support the actions to improve the barrier identified.

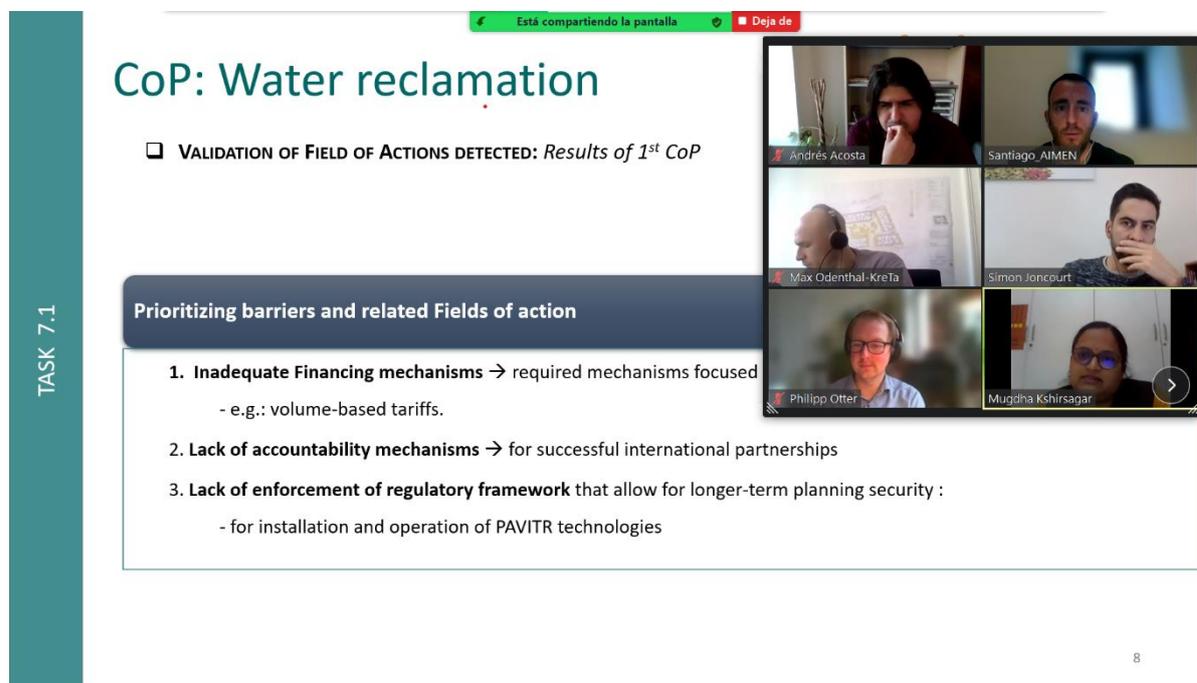
## 4.1. Water potabilization and rainwater harvesting – 2<sup>nd</sup> CoP:

### 4.1.1. Participants

This CoP took place on 11<sup>th</sup> November 2021, and in it participated:

- Participants: AUTARCORN (Philip Otter), KRETA (Max Odenthal), SIT (Mugdha Kshirsagar) and TTZ (Andrés Acosta).
- Moderators: SEECON (Simon Joncourt), AIMEN (Santiago Gómez Cuervo).

The Indian participation of the researcher from SIT Pune allowed to check the problems identified and enrich the discussion. In the next figure, it could be seen a screenshot of the event.



**CoP: Water reclamation**

❑ VALIDATION OF FIELD OF ACTIONS DETECTED: *Results of 1<sup>st</sup> CoP*

**Prioritizing barriers and related Fields of action**

- 1. Inadequate Financing mechanisms** → required mechanisms focused
  - e.g.: volume-based tariffs.
- 2. Lack of accountability mechanisms** → for successful international partnerships
- 3. Lack of enforcement of regulatory framework** that allow for longer-term planning security :
  - for installation and operation of PAVITR technologies

8

Figure 7: Screenshot of the 2<sup>nd</sup> CoP of Water disinfection and Rainwater harvesting

### 4.1.2. Results of the CoP

After the initial summary of the first CoP, it was presented the barriers identified and, consequently, the field of actions on which work must be carried out. Then it was established the desired situation for each field of action and the potential actions to achieve that situation. This information is described in Table 3: Field of actions on which CoP is working. Barriers identified and described impact associated.

Table 3: Field of actions on which CoP is working. Barriers identified and described impact associated.

Water potabilization and rainwater harvesting – 2 <sup>nd</sup> CoP		
#	Barriers identified	Desired impact/situation
1	Inadequate financing mechanisms that are more focused on long-term operations. E.g.: volume-based tariffs.	Adequate & enabling financing mechanisms.
2	Accountability mechanisms that allow for thriving international partnerships	Effective accountability mechanisms in place and clarity of accountabilities and roles.
3	Difficult to understand the regulatory framework	Resolute & effective enforcement of relevant guidelines

This information was discussed and commented on in different brainstorming parallel meetings during the event. After that, all the partners established the outputs from these actions to each barrier defined. Thus,

1. For the Inadequate Financing mechanisms that are more focused on long-term operations, it was recommended to elaborate some **Policy Briefs** which includes the necessity to provide to own small-scale water company grants from the Government, create awareness about the situation (connecting with the Climate change global movement) and stepwise introduce the volume-based tariff. In the same line, it is suggested to establish a document with **the best practices** including the data showing real costs and encouraging the discussion with stakeholders and consumers. Moreover, it is recommended to create a document with the experience with real cases and compare them with common practices. (Education also for socially weaker households on the socialisation of water use and treatment and the appreciation and willingness to pay a water tariff).
2. For Accountability mechanisms barrier is recommended to create a **guid of the skills and resources necessary to setting-up PAVITR solutions**, identifying an appropriate team of end- users for the training on the solution of the minor issues in the PAVITR pilots. Also, **awareness campaigns** can be taken up to understand the technology and its benefits in local area, as the village.
3. Relative to the difficulties to understanding regulatory framework it was commented the necessity to **invite third party stakeholders/ experts/decision makers to Community of Practices**, considering the invitation of local or regional government representatives to webinars or sessions to make understand the importance of clarifying accountability mechanisms. Also, it was determined that it should be used the **PAVITR pilots to use them as a communication tool, training platform** and a place to carry out webinars, workshops, talks to increase public awareness in the community. Moreover, a summary of Best Practices about the PAVITR project implementation

should be elaborated considering including the community during all the project phases, EU/India experts monitoring of the project and including actions after the end of the project.

Finally, the resultants conclusions of this 2<sup>nd</sup> CoP were:

1. Availability of empirically justified References for promoting adequate financing mechanisms.
2. Accessibility of references for training requirements for the operation of PAVITR Systems.
3. Keep the stakeholders aware and activated

## 4.2. Water Reclamation – 2<sup>nd</sup> CoP:

### 4.2.1. Participants

In this CoP took place on 8<sup>th</sup> November 2021, and in it participated:

- Participants: IRIDRA (Fabio Massi, Riccardo Bresciani), AARUS (Carlos Arias), UPC (Enrica Uggeti), NEERI (Lavanya, Divya), BIOAZUL (Pilar Zapata), BOKU (Sandra Nicolics), TTZ (Andrés Acosta, Mirko Hanel)
- Moderators: SEECON (Simon Joncourt), AIMEN (Santiago Gómez Cuervo).

The Indian participation was active, and their contribution was remarkably interesting to review the perspective provide in the 1<sup>st</sup> CoP and provide data and information about the barriers and potential solutions described. In next screenshot, it could be seen a moment of the CoP:

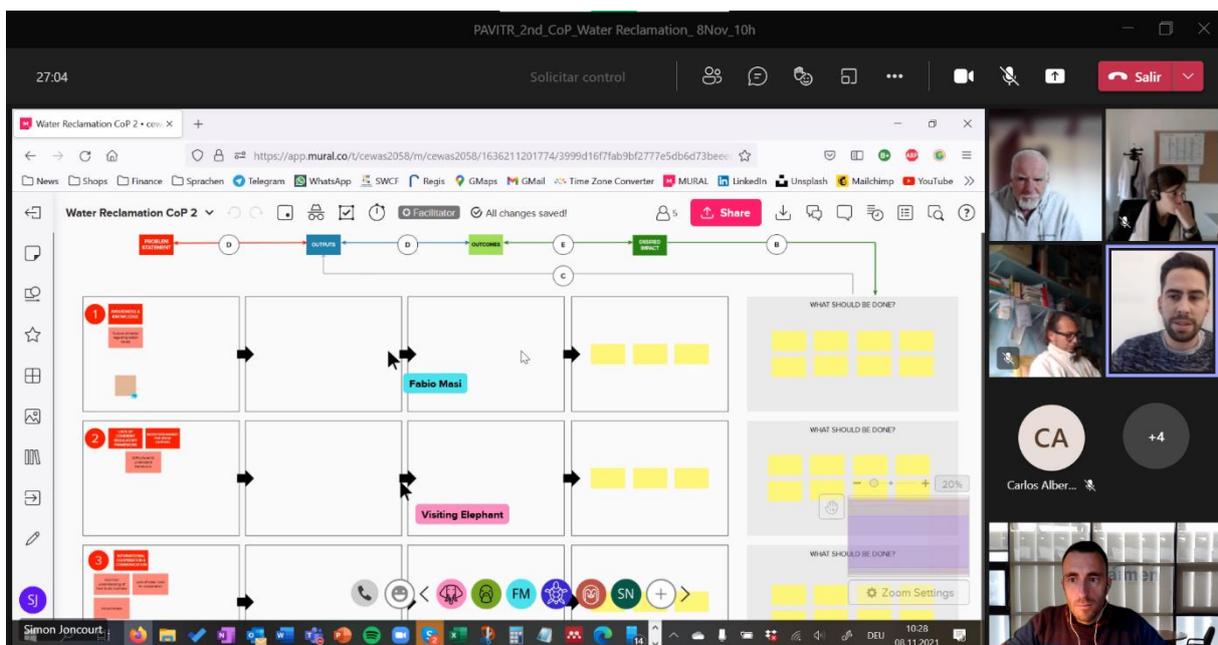


Figure 8: Screenshot of the 2<sup>nd</sup> Cop of the Water reclamation group

#### 4.2.2. Results of the CoP

The 2<sup>nd</sup> CoP started reviewing the results obtained in the first one. After checking these initial barriers, it was established the desired impact or situation. In the next table it is resumed the barriers and situation preferred:

*Table 4: Field of actions on which CoP is working. Barriers identified and desired impact associated.*

Water Reclamation – 2nd CoP		
#	Barriers identified	Desired impact/situation
1	Awareness and Knowledge. Culture of inertia regarding Water Sanitation and Hygiene (WASH) issues	General Awareness and Knowledge relative water sector. Institutional engagement and implementation of the culture of action regarding the solutions to the WASH issues.
2	Lack of coherent regulatory framework. Incentives or market for reuse	Coherent and easy-to-understand framework promoting simple system to implement, use and operate and enabling long-term operation. Stronger commercial incentives for PAVITR services /systems
3	International cooperation and communication: business, communication, and inclusiveness. Establishing rules of cooperation.	Common basis for mutual understanding in EU/India business practices. Effective communication and enabling a clear understandable set of rules/roles to coordinate projects EU/India.

According to the objective for each barrier detected, the working group started a discussion in order to identify the actions to carry out to achieve these objectives. Thus, for each barrier, it was indicated next outputs:

1. In order to increment the awareness and knowledge about the WASH importance, it was established as a result to establish **Awareness Raising Activities** to sensitize institutional entities and end-users and to make understand the benefits from clean water (economic, healthy, and environmental) and necessity to improve WASH facilities.
2. Relative to the lack of a regulatory framework it was commented an interesting output could be the **international agreement promotion (Policy briefs)** including recommendations to how to promote common treatment targets and enabling framework for the PAVITR system. Additionally, it was concluded the necessity of having a **PAVITR Portfolio listing all product/services to develop WASH business**, including info about case study in PAVITR project.
3. **Regarding the issues relative to the international cooperation, it was accepted that as and solution the collection of Best Practices** to be shared with third parties regarding EU/India partnership. In this Best Practices, it was be indicated effectiveness the role distribution where it is clear in the accountability of all the partners. Moreover, the creation of a **common platform** for promoting effective EU/Indian partnerships and sharing common issues for practitioners is desired as a tool to increment international cooperation.

Finally, the conclusions obtained in this CoP were

1. Key actors and end-users' organizations should be informed about the WASH problems solution with successful examples and solutions which are working in India and how to get there.
2. There should be communication tools available to promote a coherent regulatory framework and to establish commercial incentives, in special for PAVITR products and services.
3. There would be important to have a Collection of Best Practices for planning EU-India collaborations. Moreover, a creation of a platform for informing and engaging key actors and potential facilitators should be highly recommended.

### 4.3. Sensors and High-resolution management – 2<sup>nd</sup> CoP

#### 4.3.1. Participants

This CoP took place on 8<sup>th</sup> November 2021, and in it participated:

Participants: AIMEN (Miguel Placer, Sandra Iglesias), AMU (Nadeem Khalil), UFZ (Khaja Rahman).

Moderators: SEECON (Simon Joncourt), AIMEN (Santiago Gómez Cuervo).

The participation of Indian members provided the information required to validate the European perspective and to obtain their feedback concerning the topic presented. In the next Figure, it could be seen a screenshot of the event

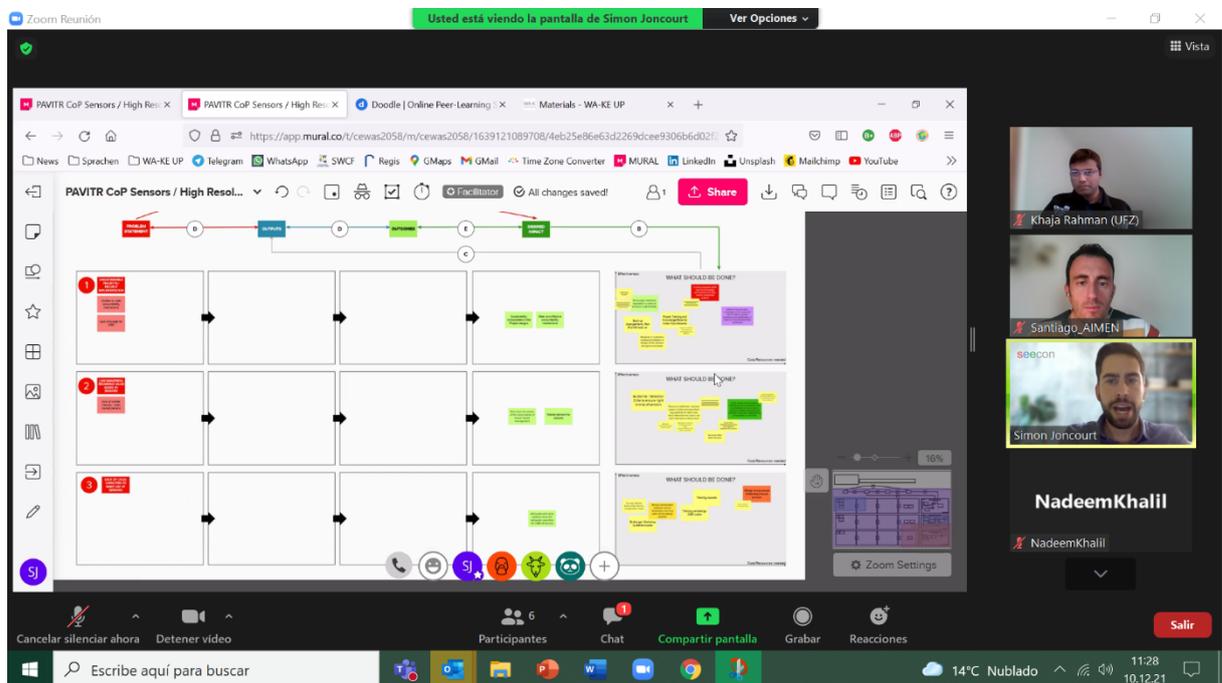


Figure 9: Screenshot of the 2<sup>nd</sup> CoP about sensors and High-resolution management

The discussion facilitated the identification of the potential solutions and the key stakeholders to consider involving.

#### 4.3.2. Results 2<sup>nd</sup> CoP

The 2<sup>nd</sup> CoP started reviewing the results obtained in the first one. After checking these initial barriers, it was established the desired impact or situation. In next table it is resumed the barriers and situation preferred:

Table 5: Field of actions on which CoP of Sensors and high-resolution management is working. Barriers identified and desired impact associated.

Sensors and High-resolution management – 2 <sup>nd</sup> CoP		
#	Barriers identified	Desired impact/situation
1	Unsustainable projects for unclear accountability and/or lack of budget for O&M	Sustainability is incorporated into the projects and clear and effective accountability mechanisms.
2	Low awareness relative to the value added by sensors. Lack of market for sensors.	End-users are aware of the added value of the sensors and there are market demands for these tools.
3	Lack of local capacities to make use of sensors	PAVITR training and material available and candidates for potential platform implementors. Collaboration between sensor developers and end users to create a user-centred product.

According to the desired situation, the working group started a discussion in order to identify the actions to carry out to achieve these objectives. As a result, some outputs for each barrier were concluded:

1. For the lack of sustainability in the projects and not accountability mechanisms, it was recommended the implementation of Policy Briefs and Best Practices and Designs principles as a requirement of contracts relative to the water sector
2. Regarding the low awareness relative to the sensors, it is necessary to establish a map of potential institutions that should be in the driving of raising awareness. Moreover, it is important also to organize an event with the participation of key actors for visualizing the importance of sensors and high -solutions to water management.
3. For incrementing the capacities, it should be established PAVITR training, which it is explained the sensors and resolution tools. Also, it would be recommended to establish collaboration between sensor developers and end-users in order to create a user-centered product.

Finally, the conclusions obtained in this CoP were:

1. Encourage institutions to create more restrictive legislation to increase sustainability requirements in water projects. Also, Include sustainability as a characteristic in the contract company/institutions in charge of sensors.
2. Awareness campaigns with local partners, consulting, and end-users about the importance of sensors and high-resolution tools. It is recommended to include a local Market Assessment for the sensor’s implementation

AS an essential point, it must be organized informative and training campaigns for end-users to embrace the use of sensors in their O&M activities.

## 5. Results of the CoPs

After six sessions of meetings and workshops in which eleven partners of the project take part and around 17 people participated actively in the event the Community of Practices have provided interesting points relative to the problems identified by companies, university and researcher centres in the water and wastewater sector, potential solutions to overcome these issues and the stakeholders and expert and decision makers which could be involved in future events in order to create a change in the dynamics of the water and wastewater sector in India. Although the experts were discussing their topics in general it could be seen different common points under discussion in the three topics. Thus, in the first CoP, in which it was the starter point for understanding the sector situation, the participants of the three topics identified next common barriers as one of the most important to face:

- **Financial mechanisms are not focused on the long-term** and there are **no defined accountability mechanisms**. It means maintenance and operation phases are not considered in the projects, which difficult for the correct operation of the systems and the data collection for improvements.
- Lack of **public awareness about the environmental issues and their consequences** in the citizens and in the institutions, as well as the necessity to raise awareness about the value of novelty solutions to manage the water sector.
- The **collaboration Eu-India presents challenges** associated with the bureaucracy, understanding, information, etc.

After the 2nd CoP, in which int was discussed about the ways to overcome this barrier, trying to identify the optimal scenario to work and defining potential outputs, the common solutions offered by the experts are the next:

- It is essential to keep key actors, stakeholders and end-users informed and active about the water and wastewater treatment and disinfection, remarking the importance of sustainability and innovative technologies applied and using successful examples of these solutions in India.
- PAVITR project must include informative and training campaigns in the PAVITR pilots. It must involve end-users, operators, and responsibilities for the O&M phase after the project.
- It is recommended to develop a communication tool available to promote a coherent regulatory framework and to establish commercial incentives for PAVITR products and services.
- There is a necessity to create a Collection of Best Practices for planning EU-India collaborations and the creation of a platform for informing and engaging key actors and potential facilitators for the EU-India projects.
- Include sustainability requirements in water and wastewater project should be a requirement of the institutions through restrictive legislation which control the contract company/institution.

## 6. Next step and further lines

In the period of PAVITR project rest the interaction with stakeholders is essential for the evolution of the work carried out so far. Also, it is considered fundamental to work together with other partners to join events and attract more participants and increment the probabilities to reach the correct audience. In this sense, it was established as part of this PPWG the Main Group. **The Main Group (MG)** will be the nexus between the information generating in each specific group and the stakeholders. MG will act as the mechanism which will define the guidelines for each specific group according to the feedback obtained from the meetings with the stakeholders. They will evaluate the different perspectives of the problems planted from a general point of view and will show the conclusions and solutions to the stakeholders and other relevant audiences. Consequently, it will provide information for the PPWG about the interests, gaps, and necessities of the Indian market. With this key information, the main group will drive the specific group discussion for the next period to obtain answers to the problems detected by the end-users of the technologies (i.e., Governments, private companies, etc.) This feedback is an especially crucial point for maintaining the PPWG in continuous evolution and to reach the final goal of the platform.

The next event of the **MG is estimated to be the 2022** and is planned the integration of this event in the biggest event, such as an international water congress or fair. Thus, the possibility to reach stakeholders is increased and the visibility of the work carried out in PAVITR would increment considerably.

After this MG event, it will be studied the strong points of the CoPs and MG event will be evaluated correctly to proceed at the end of the project to catapult the results of this PPWG.