Ref. Ares(2022)713002 - 31/01/2022

PAVITR

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 D8.7

Policy briefs and Short report on the Policy Advocacy

Version: 1

Work package:	**WP8 - Exploitation and Dissemination of Results**
Responsible partner:	**1 – Seecon** **2 – AMU** **3 – NEERI** **(4 – 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 **grant agreement No 821410**

Document change history

Version	Date	Author	Description
1	31.01.2022	Simon Joncourt (seecon gmbh), Leonellha Barreto Dillon (seecon gmbh)	1st draft version

Table of content

Note from the author: In the following sections, the content of the three policy briefs in accordance with D8.7 is documented in the standard PAVITR deliverable submission format. The reader is kindly asked to note that for the dissemination of the policy briefs with third-party stakeholders, each policy brief is formatted as individual document (water purification, (waste)water reclamation and high-resolution management). These documents contain both text that is commonly shared among all of the three policy briefs (introduction, system-level barriers, etc.) as well as text that is particular to each of the documents (project-level/technology-specific barriers). To avoid repetition, the policy briefs have been conflated into one single document for the sake of this deliverable.

1. Policy Briefs

1.1. Introduction

The 2019 Water Crisis in Chennai and its approaching "Day Zero", date on which the city would have officially run out of water (see box), brought social unrest to the millions of inhabitants in the city. The case of Chennai is an example of how uncoordinated, unsustainable water and sanitation management, coupled with climate anomalies, can pose an existential threat to cities, towns and even entire regions.

By the end of 2019, abundant monsoon rain had relieved the metropole, but experts warn that Chennai should be understood as a glimpse into the near future, when these incidences will become more and more common in India.

India is suffering from an increasingly severe water crisis that has the potential to jeopardize economic growth, livelihoods, public health, civil peace, as well as ecological sustainability. India is home to approximately 17% of the World's entire population, but only has 4% of the planet's freshwater resources (NITI 2019). These scarce and invaluable resources are being put at risk due to unsustainable management practices. The discharge of untreated wastewater is the single most critical cause for water pollution for both surface and groundwater in India. According to the Central Pollution Control Board, the discharge of untreated or partially treated wastewater has led to an 80% contamination rate of the country's surface water (CPCB, 2009). Corresponding health and environmental impacts are severe and continue to hamper India's efforts to reach the Global Sustainable Development Goals. In 2013, the CPHEEO estimated that poor sanitation alone costed India up to $54 Billion USD when considering its economic impact on public health (CPHEEO, 2013).

The 2019 Chennai Water Crisis

Photo credit: Huemer, 2005

Amongst the 27 Asian cities that are home to more than one million inhabitants, the Indian city of Chennai is one of the worst affected in terms of per day availability of water (Ray & Shaw 2019). In 2019, the city witnessed what observers have called the "worst water crisis in 30 years" (TOI, 2019). All four major reservoirs supplying drinking water to the city had run critically dry, leaving many residents with very precarious access to freshwater. The competition for water was so severe in some cases, that it led to violent conflict. Chennai is predominantly reliant on ground water for its water supply, even though three rivers flow through the big metropole, since this surface water is deemed unsafe due to the "untreated sewer being discharged into it for decades" (TOI, 2019).

"TO TACKLE THE COMPLEX WATER CHALLENGE FACING INDIA, IT IS IMPERATIVE TO TAKE A HOLISTIC VIEW OF WATER, STARTING WITH THE HYDROLOGICAL SYSTEM, THE INTERACTIONS OF THIS SYSTEM WITH CLIMATE CHANGE ON THE ONE HAND, AND WITH HUMAN FACTORS ACROSS AGRICULTURE, INDUSTRIAL, AND ENERGY PRODUCTION ACTIVITY ON THE OTHER." - NATIONAL INSTITUTE FOR TRANSFORMING INDIA, 2019

1.2. The PAVITR Project

Figure 1: PAVITR Logo

The Initiative **"Potential and Validation of Sustainable Natural & Advance Technologies for Water & Wastewater Treatment, Monitoring and Safe Water Reuse in India."** or PAVITR is a joint project of the European Union and the Department of Sciences & Technology of the Government of India and contributes to the solution of these problems (visit: https://pavitr.net/). The main aim of this project is to validate, deploy and develop cost-effective & sustainable solutions to tackle water challenges and ensure the provision of safe water reuse, rejuvenate water quality of rivers, and restore ecosystems in India. The successful execution of PAVITR will strengthen the Sustainable Development Goals' (SDGs), in particular SDG6 which is to "Ensure availability and sustainable management of water and sanitation for all". This will be achieved by deploying cost-effective and sustainable technologies in the following areas:

- Water purification technologies
- Wastewater treatment/reclamation technologies
- High resolution management technologies

These types of technologies are well positioned to promote a "circular"/holistic approach to water related challenges in India. The following table provides an overview of the various technologies that PAVITR is implementing at corresponding pilot sites:

No.	Technology	Location
1	Electro-Chlorination (ECl2) system for decentralized water disinfection	Pune
2	Anaerobic Baffle Reactor (ABR) + Constructed Wetland (CW)	Pune
3	Rainwater Harvesting (RWH) system	Dhanbad
4	Sequencing Batch Reactor (SBR) optimisation	Dhanbad
5	RichWater Sequencing BatchReactor (SBR)	Aligarh
6	High-Rate Algal Pond (HRAP)	Aligarh
7	Short Rotation Plantation (SRP)	Aligarh
8	French Reed Bed (FRB)	Aligarh
9	Sensors for Upflow Anaerobic Sludge Blanket (UASB) process	Aligarh
10	Faecal Sludge andSeptage Management (FSSM): Sludge Drying Reed Bed (SDRB)	Aligarh
11	Improved Moving Bed Biofilm Reactor (MBBR)	Nagpur
12	Submerged Aerobic Fixed Film Reactor (SAFF)	Nagpur
13	Faecal Sludge and Septage Management (FSSM): Mechanical Dewatering and Drying System (MDDS)	Visakhapatnam
14	Integrated MBBR VFCW – Toxidation unit	Kharagpur

Table 1: Overview of Technologies implemented during PAVITR Project

1.3. System-level barriers to scale PAVITR technologies in India

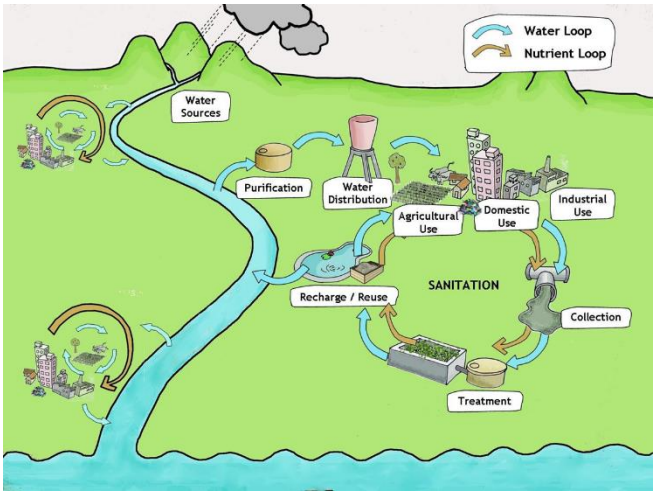

Figure 2: Integral approach to managing the water and nutrient cycles Source: www.sswm.info

PAVITR aims to create precursors to the use of cost-efficient and sustainable technologies for water purification, wastewater/treatment and high-resolution management. However a series of factors impede a rapid and systematic proliferation of PAVITR technologies across India and promote a systemic transition towards a circular approach to water and nutrient management that incorporates aspects of Resource Recovery and Reuse (RRR) into all stages of planning, designing, set-up and operation of solutions for water related challenges.

Financial aspects: Around 50% of Indian agricultural land relies predominantly on rainfall for irrigation, however changing precipitation patterns, surface water pollution, growing demand for water-intensive crops and dwindling energy prices (for operating groundwater wells) have contributed to the increased use of groundwater for irrigation in India. Even though increased water stress is potentially opening up the possibility of cheap irrigation water becoming a demand in the market, as things stand today, the perception of water abundancy makes it challenging to have the right market environment for financing decentralized, smaller- to medium-scale circular solutions for water and sanitation management. For example, the World Bank et al. (2016) mentions that while revenue generated from industrial reuse is adequate to meet the O&M expenses, agricultural reuse generates negligible revenue for utilities as the willingness to pay for treated wastewater and faecal sludge products is low. Additionally, allocation for capital funds for integrated water and sanitation management has been of low priority, despite significant efforts from the Indian government to abolish the practice of open defecation and towards having adequate water supply for all under the Swachh Bharat Mission and Jal Jeevan Mission.

Environmental aspects: India has a limited amount of water at its disposal. Due to topographic and hydrological constraints, amongst others, the water available for usage in India is estimated at 1123 BCM (Billion Cubic Meters), which comprises 690 BCM of surface water and 433 BCM of renewable groundwater resources. But these resources are unevenly distributed across the country. For example, the Ganga-Meghna-Brahmaputra basin accounts for 60 % of India's water resources but covers a land area of only 33 %. Catchment of rivers flowing west is 3 %, accounting for 11 % of the country's water resources (TTZ, 2015). Climate change and changing rainfall patterns will most likely further exacerbate the unequal distribution. The inadequate approach to sanitation and wastewater treatment therefore puts the water reserves at risk of becoming unsafe for human use.

Socio-cultural aspects: Both traditional and political worldviews as well as culturally engrained habits and beliefs can create barriers to an integrated and circular approach to water and sanitation management. India’s vast religious and cultural diversity creates a challenging environment to conceive, communicate and implement water and sanitation schemes that include commodification of water resources. The non-debatable human right to water is a topic that often goes hand in hand with the political belief that water should not under any circumstances be sold as a commodity. Without making a statement about the validity of this claim, this view leaves many questions regarding the financing of its management and service delivery unanswered. Furthermore, reuse schemes for so-called “toilet

resources" may be confronted with political resistance due to low awareness regarding the safety of such solutions. Additionally, a certain acceptance of intermittent, rather sub-standard service is undermining the bottom-up pressure for change that should come from end-users who are struggling with more immediate day-to-day challenges. Last but not least, integrating lower-income populations into formally planned and officially approved integrated, circular water and management schemes might be confronted with resistance where people fear losing their precarious and informal residences, as is the case with slums.

Institutional aspects: Even if recent policy reforms have started to consider an integrated, circular approach as a central design principle for managing water and sanitation, the current institutional landscape in India creates an environment where a coherent implementation of such policies is unlikely. First, sanitation has until recently been low on the priority list of the Indian Government(s) and the awareness about the inherent linkages to public health and economic growth have received little attention. Second, many gaps and overlaps of responsibilities remain common despite a longer series of sector reforms in the last 20 years. This has resulted in a situation where responsibilities are delegated or passed around. For example, the devolution of the responsibility for urban governance to Urban Local Bodies has not been implemented fully, which has led to little improvement in the overall performance of sub-state water and sanitation management. Third, most local and regional decision-makers have so far devoted little attention to setting up arrangements and planning approaches that include city- or town-wide sanitation planning, resulting in a "piece-meal" approach that takes neither the full sanitation value chain into account nor the many interlinkages with public health, local economies, agriculture and environmental protection. Fourth, sanitation has traditionally been provided to citizens by public agencies with little regard to actual demand, preferences and needs, resulting in below optimum adoption rates of sanitation solutions. The level of civic involvement through the engagement of grass-roots organizations, NGOs and other organizations from the civil sector has been low. Additionally, those who are typically most in need of adequate water and sanitation solutions are often not regarded as important on a voter bases, for local and regional democratic leaders. Fifth, land acquisition for wastewater management is a complex administrative and often costly challenge, especially when no effective cost recovery arrangements are incorporated. This is especially true for urban contexts, where land is typically scarce.

In summary, India's public health and prosperity would greatly benefit from a coherent, coordinated effort to push for an integrated, circular approach to water and sanitation management, especially in times of climate change, accelerating urbanization rates and increasing demand for high quality and safe water.

PAVITR IN A NUTSHELL

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

Objective	Validate, deploy or develop cost-effective & sustainable solutions to tackle water challenges and ensure the provision of safe water reuse, rejuvenate water quality of rivers, and restore ecosystems in India.
Total Budget	Total budget: 5'446'073 € / 472'666'530 INR
Demonstration sites	14
EU Project Partner	12
Indian Project Partner	10

1.4. Project-level barriers to scale PAVITR technologies in India

1.4.1. Water reclamation

PAVITR project partners from the EU as well as India have formed a working group to analyze, discuss and search solutions for challenges that the project team has identified over the course of the planning, designing, setting-up and operating phases of PAVITR technologies. The following section summarizes the technology-specific barriers that are most problematic for the successful replication and scale-up of PAVITR technologies in India.

Within its broader goals, PAVITR aims to contribute to the implementation of integral management of water resources across all sectors. PAVITR technologies that integrate systems such as Anaerobic Baffle Reactor (ABR) + Constructed Wetland (CW), French Reed Bed (FRB), or Short Rotation Plantation (SRP) for decentralized water treatment and potential reclamation are well positioned to provide the tools to promote a sustainable approach to the provision of safe sanitation services. Despite this ambition the PAVITR project team has identified a series of key barriers that have slowed down and challenged the rapid, smooth and sustainable set-up of such systems within the framework of an EU-Indian Partnership.

A. Low awareness and lack of knowledge regarding pressing sanitation issues

Key among the challenges faced by the PAVITR team were the difficulties related to a relatively low market demand for PAVITR sanitation solutions, especially for water reclamation components. This is ultimately (but not only) tied to the fact that awareness among target groups and end-users is relatively low when it comes to the public health as well as environmental risks and corresponding potential (low-cost) solutions. Consequently, potential project partners such as sub-regional decision-makers and municipal governments tend not to prioritize (decentralized) wastewater management. On the other side, end-users either choose to remain passive in terms of demanding better wastewater management solutions or lack the political leverage to pressurize decision-makers to invest resources accordingly.

Recommendations: To stimulate demand and mobilize more public and private resources to implement PAVITR wastewater management solutions, PAVITR project partners recommend taking action in

1) increasing awareness about the importance and benefits of (waste)water reclamation among end-user groups including sub-national decision-makers and stakeholders

B. Inadequate/incoherent framework for wastewater reclamation

Policy frameworks regulating and incentivizing wastewater reclamation have yet to be optimized for allowing PAVITR wastewater management solutions to proliferate across India. Lack of adequate pricing and tariff models, very high/inflexible standards for wastewater reuse and the absence of regulations that would create strong incentives for wastewater reclamation make it extremely challenging for PAVITR wastewater management solutions to create a market demand.

Recommendations: To ensure that the creation of a market demand for PAVITR wastewater treatment solutions can be initiated, PAVITR project partners recommend taking actions in

1) establishing and/or update common treatment targets for specific reuse/discharge practices in order to create a more flexible and coherent framework for wastewater reclamation
2) raising awareness among key stakeholders and sector policy-makers about the need, importance and benefits of (decentralized) wastewater reclamation

C. Lack of adequate platform for multinational cooperation

Experiences during the implementation of EU-Indian projects such as PAVITR have revealed a series of challenges on the institutional level when coordinating multinational project activities. These challenges are strongly related to different notions of project management and teamwork, the underestimated importance of setting-out clear roles and responsibilities, and challenges in regard to continuous inter-team communication.

Recommendations: To ensure that multinational projects like PAVITR can be implemented on the basis of smooth and efficient multinational cooperation between project teams, PAVITR project partners recommend taking action in

1) providing resources/knowledge in terms of best practices for successful EU-India cooperation
2) creating a platform for coordinated EU-India project collaboration that allows for project team members to share information, key documents and interact seamlessly

1.4.2. Water purification (and rainwater harvesting)

PAVITR project partners from the EU as well as India have formed a working group to analyze, discuss and search solutions for challenges that the project team has identified over the course of the planning, designing, setting-up and operating phases of PAVITR technologies. The following section summarizes the technology-specific barriers that are most problematic for the successful replication and scale-up of PAVITR technologies in India.

Within its broader goals, PAVITR aims to contribute to the implementation of integral management of water resources across all sectors. PAVITR technologies such as Rainwater Harvesting (RWH) systems and Electro-Chlorination (ECl2) systems for decentralized water disinfection are well positioned to provide the tools to promote a sustainable approach to the provision of safe drinking water and the wide use of rainwater infiltration (or reuse) systems. Despite this ambition the PAVITR project team has identified a series of key barriers that have slowed down and challenged the rapid, smooth and sustainable set-up of such systems within the framework of an EU-Indian Partnership.

A. Financing mechanisms and longevity of installed solutions

Key among the challenges faced by the PAVITR team was the difficulties related to ensuring the operational durability of the systems installed. Willingness to pay among end-users is generally low and the lack of adequate financing mechanisms such as volume-based tariffs for financing operational expenditure for water purification technologies are making it difficult to implement measures for

securing longer-term operational durability on the project level. Consequently, many water purification installations are inadequately maintained, operate at sub-optimal levels or break-down completely after a couple of years upon project completion.

Recommendations: To enable the use of adequate financing mechanisms and enable longer-term operational durability of PAVITR water purification technologies, PAVITR project partners recommend taking action in

2) improving the availability of empirically justified references for promoting adequate financing mechanisms
3) raising the awareness among key stakeholders to support the implementation of adequate financing mechanisms

B. Accountability mechanisms for longer-term operational durability

The above-stated system-level challenges in terms of institutional responsibilities and accountability challenge the successful implementation of PAVITR technologies that provide longer-term solution to water-related challenges at a satisfactory level of quality. Fragmented governance structures of water-related issues at a local and regional level make it hard for technology providers and project managers to understand the accountability mechanisms that are used to assign responsibilities regarding the adequate operation and maintenance of installed PAVITR technologies.

Recommendations: To ensure the effective accountability for operation and maintenance of prevailing water treatment standards and create greater clarity for project managers in terms of the roles and responsibilities within the local and regional institutional framework for water governance, PAVITR project partners recommend taking action in

2) increasing the availability of and access to accountability mechanisms (read public health offices, water quality monitoring institutions, etc.) for end-users. This could help to reinforce the accountability of drinking water providers towards end-users.
3) increasing the availability of references for training requirements for the operation of PAVITR Systems. This could help to increase the awareness regarding the importance of adequate regular maintenance procedures among (rural) water service providers.

C. Lack of enforcement of recommended guidelines/standards

Closely related to challenge B), the lack of effective and reliable enforcement mechanisms in regards to the compliance with prevailing standards and guidelines is challenging the efforts towards securing product quality of installed PAVITR technologies in the long run. The Indian regulatory framework around the provision of safe drinking water can in itself be seen as being conducive for PAVITR technologies, but the low efficacy and reliability of enforcement mechanisms are the key bottlenecks in this regard.

Recommendations: To ensure that the regulatory framework around the provision of safe drinking water is being enforced in an effective and reliable way, PAVITR project partners recommend taking actions in

2) increasing the awareness among key stakeholders and sector actors on the local and regional level regarding the importance and benefits of setting-up reliable and effective enforcement mechanisms regarding the provision of safe drinking water
3) engage key sector actors to enable coordinated work across sectors to increase the reliability and efficacy of enforcement mechanisms

1.4.3. High-resolution Management

PAVITR project partners from the EU as well as India have formed a working group to analyze, discuss and search solutions for challenges that the project team has identified over the course of the planning, designing, setting-up and operating phases of PAVITR technologies. The following section summarizes the technology-specific barriers that are most problematic for the successful replication and scale-up of PAVITR technologies in India.

Within its broader goals, PAVITR aims to contribute to the implementation of integral management of water resources across all sectors. PAVITR technologies that integrate solutions for high-resolution management for water management are well positioned to provide the tools to promote a sustainable approach to increase the efficiency of water services delivery as well as to help improving continuous quality monitoring. Despite this ambition the PAVITR project team has identified a series of key barriers that have slowed down and challenged the rapid, smooth and sustainable set-up of such systems within the framework of an EU-Indian Partnership.

A. Low operational durability for projects after completion

Key among the challenges faced by the PAVITR team were the difficulties related to the set-up of institutional set-ups that allow for longer-term operational durability of water management plants. A lack of budget for operation and maintenance make it difficult to fully capitalize the potential benefit of smart sensors for monitoring water management plant performance. Additionally, ambiguous distribution of roles and responsibilities for the operation of the water management plant and corresponding high resolution management system jeopardize the longevity of the project results.

Recommendations: To improve operational durability of high-resolution management systems after project completion (read sensor installation and set-up), PAVITR project partners recommend taking actions in

4) creating regulatory frameworks that encourage and incentivize the use of high-resolution management systems
5) promoting best practices for the design of project contracts, particularly with respect to the allocation of budgets towards the O&M costs

B. Low market demand and awareness

Potential end-users such as water service providers are typically unfamiliar with the benefits of using sensors to increase efficiency and efficacy of (waste)water treatment plants. Hence market demand for high-resolution management solutions is low and the sales of such systems typically come with a substantial effort to explain and convince end-users.

Recommendations: To ensure that the creation of a market demand for PAVITR high-resolution management solutions can be initiated, PAVITR project partners recommend taking actions in

3) raising awareness regarding the costs of current performance monitoring practices vs. the benefits of high-resolution management solutions

   conducting market studies related to the market potential for high-resolution management solutions

C. Lack of local capacities to make use of sensors

Experiences with the installation of high-resolution management solutions in (waste)water treatment plants in India have revealed that local capacities and know-how to make proper use of metering sensors are often inadequate. Even if capacity building is integrated in the hand-over process, staff fluctuations

and the sometimes unclear distribution of roles and responsibilities result in inadequate use and maintenance of the sensors.

Recommendations: To ensure that the benefits PAVITR high-resolution management solutions can be fully capitalized by the end-users, PAVITR project partner recommend taking actions in

3) promoting strong collaboration between sensor developers and end users during design process in order to create a user-centred product that adequately reflects local conditions on the ground
4) implementing information and training campaigns for end-users to increase end-user acceptance and know-how regarding the use of sensors in their O&M activities

1.5. Conclusions and system-level policy implications

"ALL INDIAN CITIES AND TOWNS BECOME TOTALLY SANITIZED, HEALTHY AND LIVABLE AND ENSURE AND SUSTAIN GOOD PUBLIC HEALTH AND ENVIRONMENTAL OUTCOMES FOR ALL THEIR CITIZENS, WITH A SPECIAL FOCUS ON HYGIENIC AND AFFORDABLE SANITATION FACILITIES FOR THE URBAN POOR AND WOMEN" (NATIONAL URBAN SANITATION POLICY, 2008)

The National Urban Sanitation Policy has set out a clear vision for India's population. Now is the time to make this vision a reality. The above-described challenges have implications for both national policymakers as well as regional and sub-state decision-makers. If the vision of a totally sanitized, healthy and livable India is to be realized, the following policy implications need to be taken into account:

1) Realizing integrated and circular water and sanitation solutions is complex and costly. In order to properly fund the path to a totally sanitized, water secure India, the flexibility for financing water and sanitation solutions needs to be increased to redefine system boundaries, value capture and delivery as well as to realize the potential of innovative cross-sectoral partnerships.
2) Topography, weather patterns and climate change provide a clear guidance on what tailor-made and climate-smart solutions must achieve for sustainable and resilient water and sanitation supply in the long run. Top-down planners have the responsibility to factor-in the current and future availability of natural water resources to their best capacity and capability.
3) Human needs regarding water and sanitation cannot be converted into a market demand without end-users being aware of the value of integrated and circular solutions as well as the risks of politically or religiously biased views on sustainable water and sanitation management.
4) The ambiguous division of roles and responsibilities slows down progress and jeopardizes even the most aspirational goals. National policymakers must seek to create and communicate a clear sector organization to hold sub-national entities accountable to development plans related to water and sanitation. State and sub-state decision makers need to sit in the "driving seat" and lead by example, while coordinating the efforts of involved parties in coherence with these development plans. Effective and reliable accountability as well as enforcement mechanisms are required to hold all parties accountable and allow for a process of continuous improvement of service coverage and quality.

1.6. References

Abbreviation	Source
CPCB, 2009	Central Pollution Control (2009): Status of water supply, wastewater generation and treatment in Class-I cities and Class-II towns of India. Control of urban pollution series: CUPS 70/2009-100. New Delhi: CPCB, Ministry of Environment and Forests, Govt. of India.
CPHEEO, 2013	Central Public Health & Environmental Engineering Organisation (2013): Introduction, Chapter 1 of the Latest Manual on Sewerage and Sewage Treatment Systems Part A Engineering. In: Manual on Sewerage and Sewage Treatment Systems – 2013. Online Publication, available at: http://cpheeo.gov.in/cms/manual-on-sewerage-and-sewage-treatment.php. (18.07.2020)
NITI, 2019	National Institute for Transforming India (2019): Composite Water Management Index. Online Publication. Available at: http://social.niti.gov.in/. (18.07.2020)
WBSCD, 2009	World Business Council for Sustainable Development (2009): Water, Energy and Climate Change. A contribution from the business community. Online Publication, available at: https://docs.wbcsd.org/2009/03/WaterEnergyandClimateChange.pdf
Ray & Shaw, 2019	Ray B., Shaw R. (2019): Water Insecurity in Asian Cities. In: Ray B., Shaw R. (eds) Urban Drought. Disaster Risk Reduction (Methods, Approaches and Practices). Springer, Singapore.
Foto Credits	
Huemer	Huemer, C. (2005), Slum in Chennai. Retrieved from: https://de.wikipedia.org/wiki/Datei:Slum_in_Chennai.JPG (20.07.2020).

2. Short report on the Policy Advocacy

Corresponding Work Package 7: Task 7.1: PAVITR Public-Private Working Group

2.1. Objective of the task

The main objective of this task consists of creating a working group of workers from different sectors related to water and wastewater. These professionals share their challenges, problems, perspectives, and passions to establish the common points between the different sectors. All this information will be focused on creating, learning, and storing new knowledge in the water sector, and discussing the potential solutions to the problems the water professionals must face.

2.2. Progress up to up to January 2022

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 different aspects via online-events, and generating recommendations and conclusions for each topic. All this information is explained in detail in the 1st Report and Publication of the PPWG (submitted in April 2021 as D7.1).

So far, 6 online workshops have been implemented in accordance to three subgroups of the PAVITR Community of Practice/PPWG: 1) Water purification, 2) Water reclamation, and 3) High-Resolution management. The results and conclusions developed by these working groups are to be used to create a communication strategy towards third party stakeholders in India including the identification of key target audiences, potential allies, as well as the main topics to be discussed. Thanks to the PPWG meetings, PAVITR project partners were able to formulate a common vision as a (policy advocacy) group, identify and prioritize barriers to wide-spread use of PAVITR technologies across India and develop a number of potential approaches to tackle these barriers together with third party stakeholders in India.

2.3. Next Steps

Following the next PAVITR team meeting, an online event will be organized to raise awareness and engage third party stakeholders on the search of viable solutions to the challenges identified.