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Description for Press Kit

Photo-irradiation and Adsorption based Novel
Innovations for Water-treatment

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Version History

Version	Date	Contributor	Description
PANIWATER Project_Short description	07/02/20	Linh Thai	Document created
PANIWATER Project_Short description_2.0.0	12/02/20	Fabio Ugolini	Text edits, figure edits, adapted format
PANIWATER Project_Short description_2.1.0	07/09/20	Fabio Ugolini	Updated description and partners list

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About the project / goal

PANIWATER (Photo-irradiation and Adsorption based Novel Innovations for Water-treatment) is an Horizon 2020 India-EU water cooperation project, co-funded by the European Commission and by the Indian Department of Science and Technology.

Globally, 2.1 billion people live without access to safe water, and about 159 million people collect their drinking water directly from surface water sources [1]. This issue is particularly prominent in water stressed areas, such as India, which accounts for a rural population of ca. 700 million, 63 million of which do not have access to clean water [2]. In addition, Contaminants of Emerging Concerns (CECs) are increasingly being detected in wastewater effluents around the world. CECs are pollutants that can cause deleterious effect to aquatic life and human health, but are not yet in routine monitoring programs [3]. In India, the Central Pollution Control Board reveals that more than 50% of wastewater remains untreated [4], at risk of compromising environmental services and drinking water resources.

PANIWATER will develop, deploy and validate in the field six prototypes for the removal of contaminants, including CECs, from wastewater and drinking water. The prototypes for wastewater treatment will consist in **(i)** a 20000 L/day multifunctional oxidation reactor, **(ii)** a 10 L/day photoelectrochemical system, and **(iii)** a 100 L/day solar photolytic plant. The prototypes for drinking water treatment will consist in **(iv)** a 300 L/hour filtration, adsorption, and UVC LED system **(v)** a 20 L transparent jerrycan for solar water disinfection, and **(vi)** a 2000 L/day electrocoagulation, oxidation, and disinfection system. These prototypes will be deployed in peri-urban and rural areas in India. The consortium will work closely with the communities at the field sites, and carry out water quality analyses, health and social impact assessments, and advocate for safe reuse of treated wastewater for irrigation, and preservation of drinking water sources. PANI technologies can find promising application among the agricultural sector, water-demanding businesses (e.g. textile, pharmaceutical), and the Indian water utilities

The goal of the project is to increase the availability of safe drinking water to the minimum level recommended by the WHO (at least 7.5 L/person/day) in target communities in India, and to obtain wastewater treatment capacity of at least 10000L /day, producing irrigation-grade, CEC-free, water

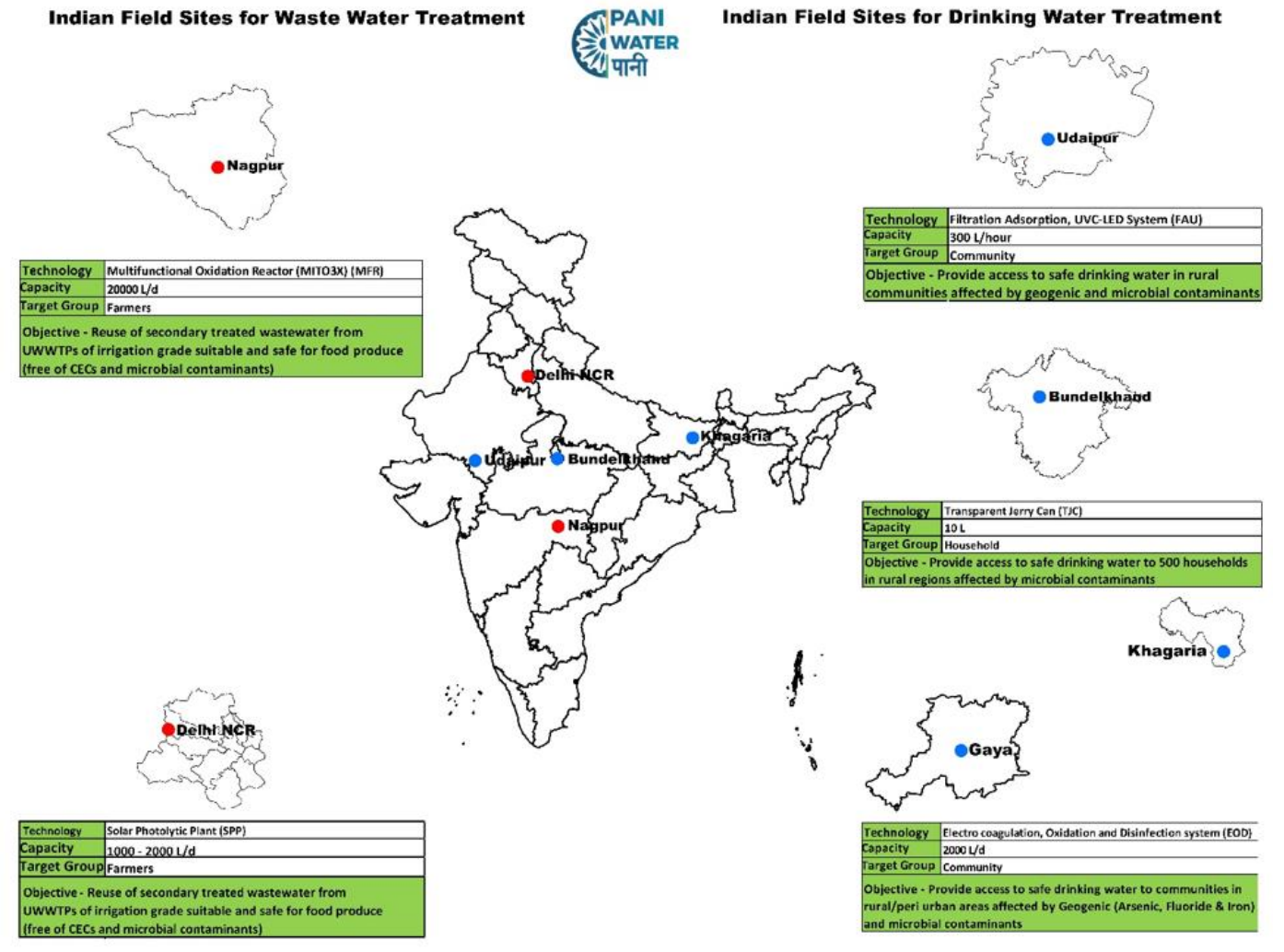
Technology

Technology	Application	Capacity	Description
1. Multifunctional reactor (MITO ₃ X)	Wastewater treatment in peri-urban areas	20000 L/d	low-cost, highly-automated reactor integrating two advanced oxidation processes for the removal of contaminants
2. Photoelectrochemical system (PES)	Wastewater treatment in households	10 L/d	Solar-driven system capable of removing organic matter, and microorganisms, and contaminants of emerging concerns
3. Solar photolytic plant (SPP)	Wastewater treatment in rural areas	100 L/d	Tertiary treatment of wastewater with an aim of disinfection and removal of CEC
4. Filtration, adsorption, UVC-LED system (FAU)	Drinking water treatment in communities	300 L/h	Photovoltaic system combining conventional filtration and adsorption with novel UVC LED disinfection

5. Transparent Jerrycan (TJC)	Drinking water treatment in households	20 L/TJC	Container inactivating waterborne pathogens by solar disinfection
6. Electrocoagulation, oxidation and disinfection system (EOD)	Drinking water treatment in communities	2000 L/d	System for the removal of geogenic contaminants (e.g. iron, arsenic, fluoride) and disinfection by chlorine dioxide

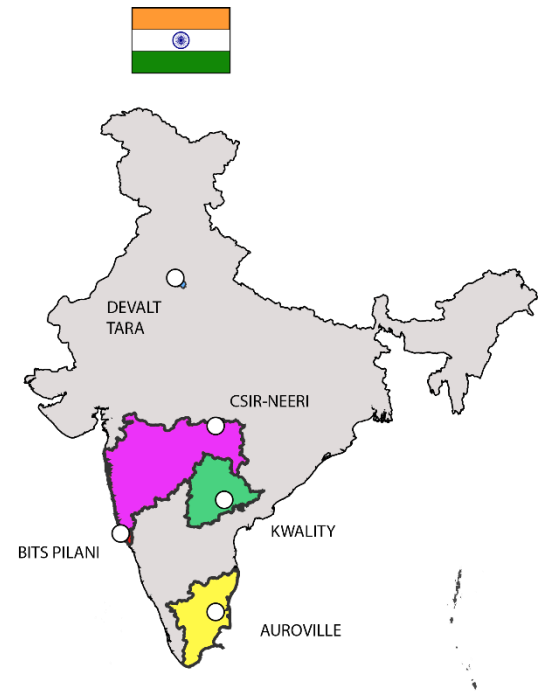
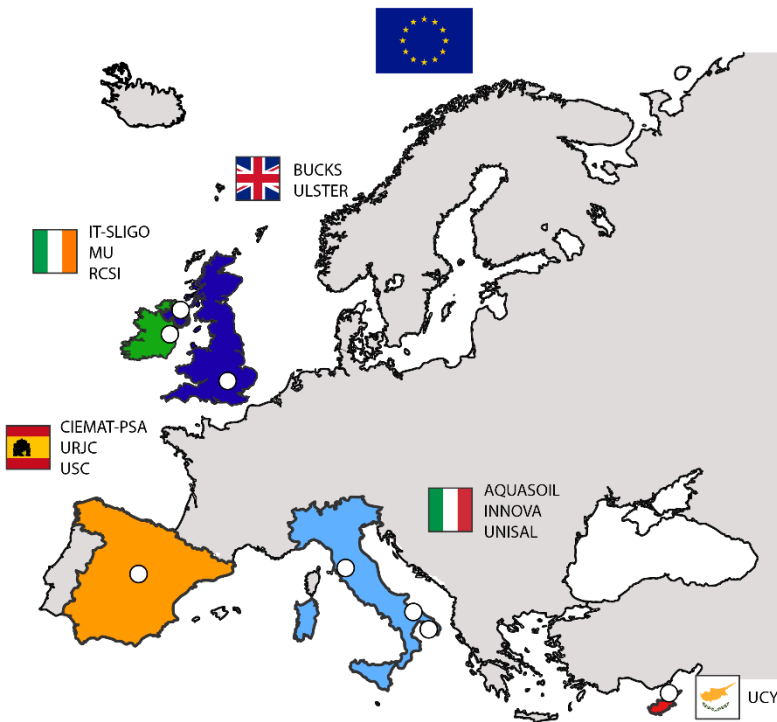
Fieldsites

- a) Savda Ghebra, Delhi, National Capital Region;
- b) Noida, Delhi, National Capital Region
- c) Niwari block, Jhansi district, Madhya Pradesh (Bundelkhand)
- d) Baghpur village, Jhadol block, Udaipur district, Rajasthan;
- e) Gogri block (Madarpur Panchayat), Khagaria District, Bihar



Project Partners

N°	Beneficiary	Abbreviation	Country
1	Royal College of Surgeons in Ireland	RCSI	Ireland (IE)
2	Universidad Rey Juan Carlos	URJC	Spain (ES)
3	National University of Ireland Maynooth	NUIM	Ireland (IE)
4	Society for Development Alternatives	DEVALT	India (IN)
5	INNOVA SRL	INNOVA SRL	Italy (IT)
6	KWALITY Photonics Private TTD	KPP	India (IN)
7	CIEMAT-Plataforma Solar de Almeria → Universidad de Almeria (Linked Third Party)	CIEMAT UAL	Spain (ES) Spain (ES)
8	University of Cyprus	UCY	Cyprus (CY)
9	University of Ulster	UU	United Kingdom (UK)
10	Institute of Technology Sligo	ITS	Ireland (IE)
11	AQUASOIL SRL	AQUA	Italy (IT)
12	Università del Salento	UNISAL	Italy (IT)
13	Buckinghamshire New University	BUCKS	United Kingdom (UK)
14	University of Santiago de Compostela	USC	Spain (ES)
15	Society for Technology & Action for Rural Advancement	TARA	India (IN)
16	Birla Institute of Technology & Science, Pilani, K Birla Goa Campus	BITS	India (IN)
17	Council of Scientific and Industrial Research → Team Trust of the Auroville Foundation (International Partner)	CSIR Team Trust	India (IN) India (IN)



Links

Website: <https://paniwater.eu/>

Facebook: <https://www.facebook.com/paniwater.eu/>

LinkedIn: <https://www.linkedin.com/company/paniwater/>

Instagram: https://www.instagram.com/paniwater_eu/

Twitter: https://twitter.com/paniwater_eu

Coordinator

Prof. Kevin McGuigan is full professor at the Department of Physiology & Medical Physics of RCSI. He is the director of the Solar Disinfection Research Group, which develops technologies to produce safe drinking water in resource-poor regions such as rural Uganda, Kenya, Zimbabwe, S. Africa and Cambodia. He was awarded the 2019 UNESCO-Equatorial Guinea International Prize for Research in the Life Sciences for his 25 years of work on water disinfection technology, including that in PANIWATER.

Contacts

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2. WaterAid, *Wild Water: the State of World's water*. 2017.
3. Environmental Pollution Agency (EPA), *Aquatic life criteria for contaminants of emerging concern*. 2008.
4. Indian Ministry of Environment Forest and Climate Change, *Central Pollution Control Board*. 2018.