

2019 WATER JOINT PROJECT INITIATIVES ON INTERNATIONAL COOPERATION

WATER FOR OUR ENVIRONMENT ECONOMY AND SOCIETY : SC-12-2018 : EU-INDIA WATER

CO-OPERATION

COORDINATOR FOR INDIA : PHOTO-IRRADIATION AND ADSORPTION BASED NOVEL INNOVATIONS

FOR WATER-TREATMENT

PANIWATER

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CSIR-NATIONAL ENVIRONMENTAL ENGINEERING RESEARCH INSTITUTE

NAGPUR, INDIA

25TH JUNE , 2019

CSIR - National Environmental Engineering Research Institute (NEERI), Nagpur, Maharashtra, India

<http://www.neeri.res.in>

CSIR-NEERI was established in 1958 due to Jaundice epidemic, as Central Public Health Engineering Research Institute (CPHERI).



From CPHERI to NEERI, the opening of new vistas

The activities of the Central Public Health Engineering Research Institute (CPHERI) which were confined somewhat to the limited field of Public Health Engineering have now moved to the national sphere covering broader aspects of Environmental Engineering. The Institute has already made its mark in many of the metropolitan cities in Indian aspects of Environmental Engineering like the Water Pollution problems, Air Pollution problems, Treatment of Industrial Wastes, Analysis of Water Sample etc.

The Prime Minister of India Hon'ble Smt. Indira Gandhi visited the Institute on 3rd January, 1974. An extract from the speech given by the Prime Minister is given below:-

"This Institute is doing valuable work and its present name is a bit limiting in the sense that people think that it is concerned only with certain small problems. Now that it is branching out and taking into the range of its activities much larger problems, it should now be called 'National Environmental Engineering Research Institute (NEERI)'. I think, as also the Minister and Dr. Nayudamma too, that the new name is more in keeping with their activities and the position which they now hold in this work not only in India but, as we were told, all over the world."

In the light of the directive contained in the speech the name of the Central Public Health Engineering Research Institute will henceforth be National Environmental Engineering Research Institute.

62nd Governing Body Meeting : 2nd May 1974

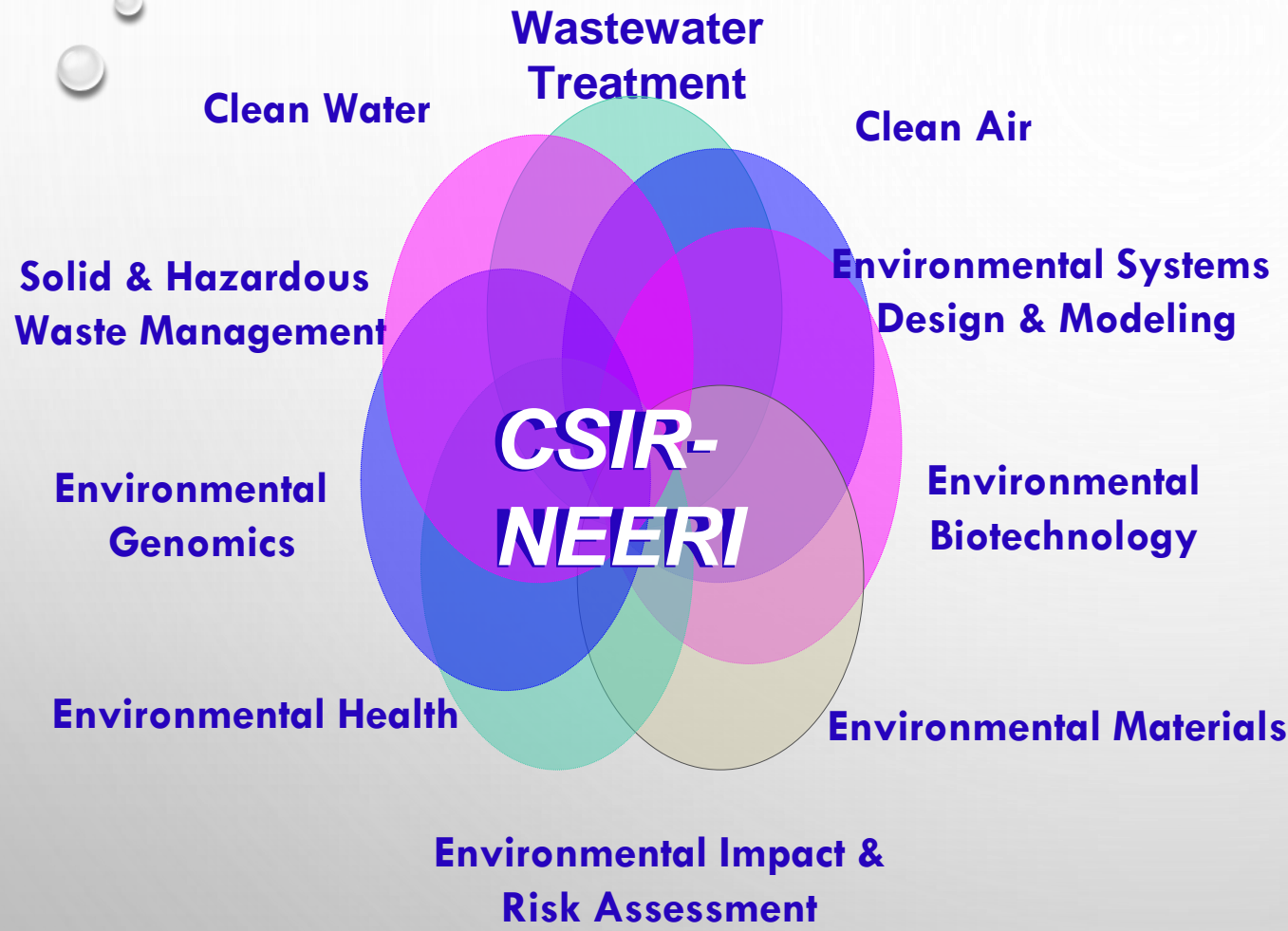
NEERI'S VISION

LEADERSHIP IN ENVIRONMENTAL
SCIENCE AND ENGINEERING FOR SUSTAINABLE
DEVELOPMENT

NEERI'S MISSION

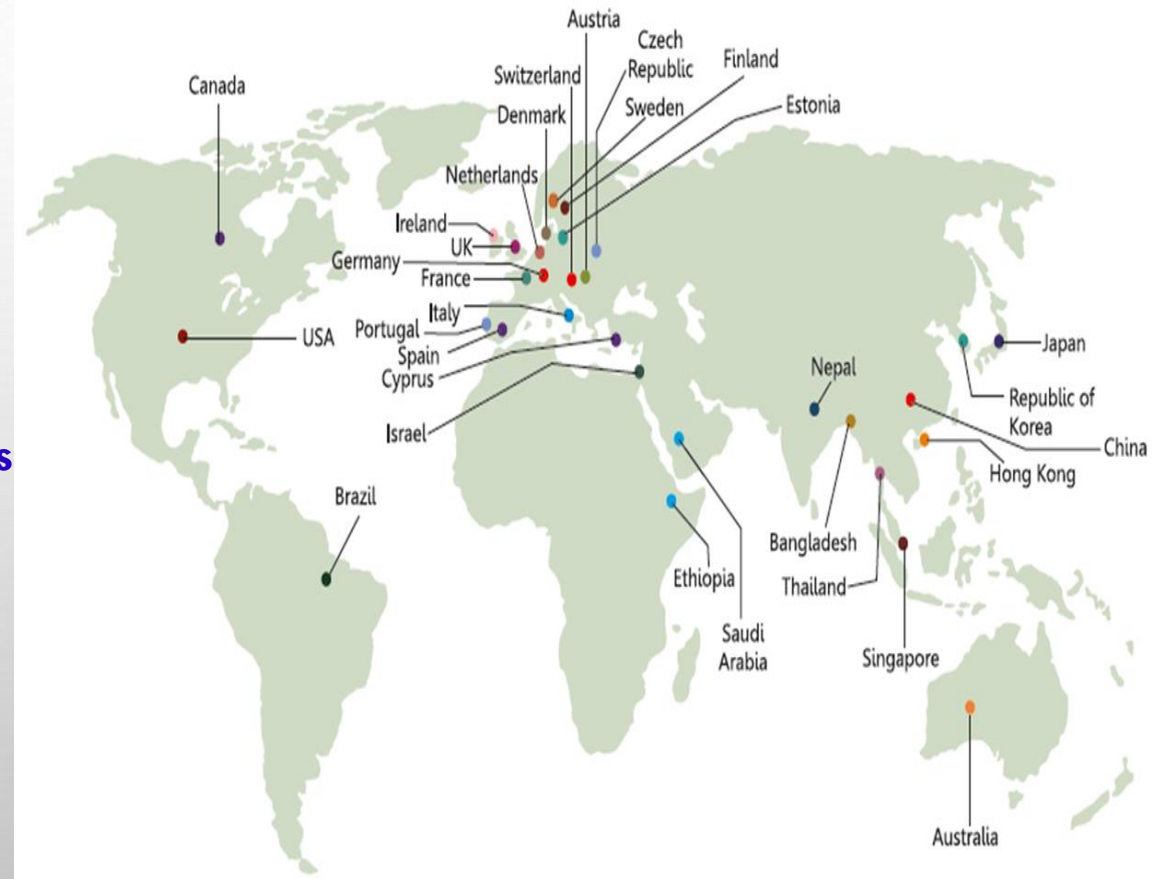
NEERI WOULD CONTINUE TO STRIVE FOR PROVIDING
INNOVATIVE AND EFFECTIVE SOLUTIONS FOR ENVIRONMENTALLY
SUSTAINABLE DEVELOPMENT AND TO HELP GOVERNMENT, INDUSTRY AND THE SOCIETY,
ESPECIALLY THE 800 MILLION UNDERPRIVILEGED PEOPLE OF INDIA.

R & D Focus












International Partnerships

- | | | | | |
|-----------------|-------------------|------------------|-----------------------|--------------|
| 1. Austria | 8. Czech Republic | 15. Israel | 22. Republic of Korea | 29. Thailand |
| 2. Switzerland | 9. Italy | 16. Ireland | 23. Hong Kong | 30. Estonia |
| 3. Japan | 10. UK | 17. Cyprus | 24. China | 31. Portugal |
| 4. Australia | 11. Spain | 18. Ethiopia | 25. Brazil | 32. Finland |
| 5. Saudi Arabia | 12. Denmark | 19. South Africa | 26. Sweden | |
| 6. France | 13. Singapore | 20. Germany | 27. Nepal | |
| 7. USA | 14. Netherlands | 21. Canada | 28. Bangladesh | |



Significant Achievements

1		Project Completed : 2400 +	5		Technology a. Developed : 20+ b. Transferred/Commercialised : 7+ <small>* Last five years</small>				
2		Publications : 1895 +	6		Active MoU a. Government/PSU : 25+ b. Private Industry/Organisation : 192+ c. Academic : 29+ d. NGOs : 5+				
3		Patents	7		Scientist-Students Connect* a. Students Benefited : 65,000 + b. Ph.D. produced : 50 + <small>* Last five years</small>				
		<table border="0"> <tr> <td style="text-align: center;">National</td> <td style="text-align: center;">International</td> </tr> <tr> <td>a. Filed: 135 + b. Granted: 84 +</td> <td>c. Filed: 74 + d. Granted: 53+</td> </tr> </table>	National	International	a. Filed: 135 + b. Granted: 84 +	c. Filed: 74 + d. Granted: 53+	8		Outreach and Training Programme* a. Outreach programme beneficiaries : 10 Lakhs + b. Training programme : 20 + c. Workshops & seminars : 80 + d. Industry persons trained : 650 + <small>* Last five years</small>
National	International								
a. Filed: 135 + b. Granted: 84 +	c. Filed: 74 + d. Granted: 53+								
4		Design Registrations a. Filed: 19 + b. Granted: 10 +							

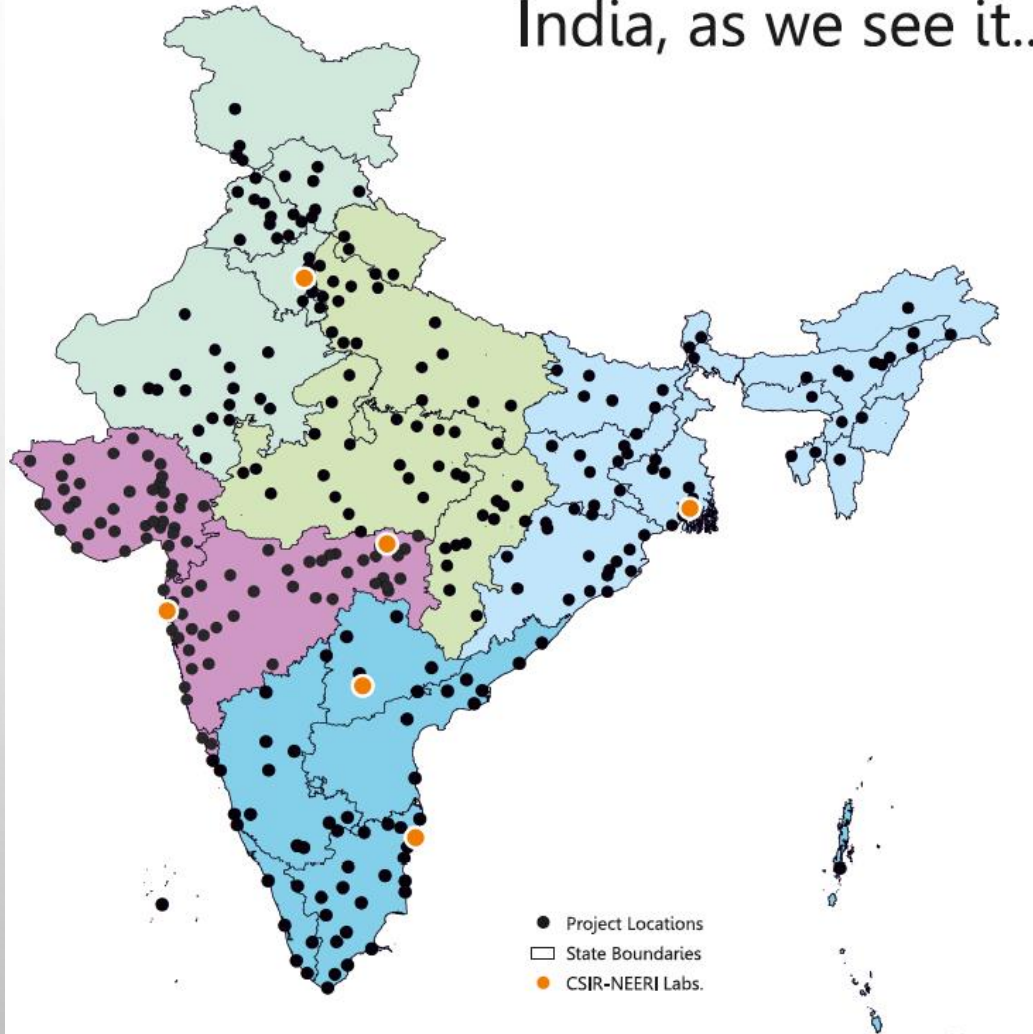
Staff Strength: 292
SCIENTISTS - 104
TECHNICAL- 35
TECHNICAL SUPPORTING - 52

CSIR-NEERI has initiated various R&D activities under 12th Five Year Plan for effective environmental monitoring in the country, which include mission projects such as “National Clean Air Mission”, “Clean Water: Sustainable Options”, “Waste Utilization and Management (COE)” and “Quantification and Mitigation of Persistent Organic Pollutants (PoPs) under Stockholm Convention”.

NEERI supports and acts as regional center for many International conventions and treaties on environmental issues.

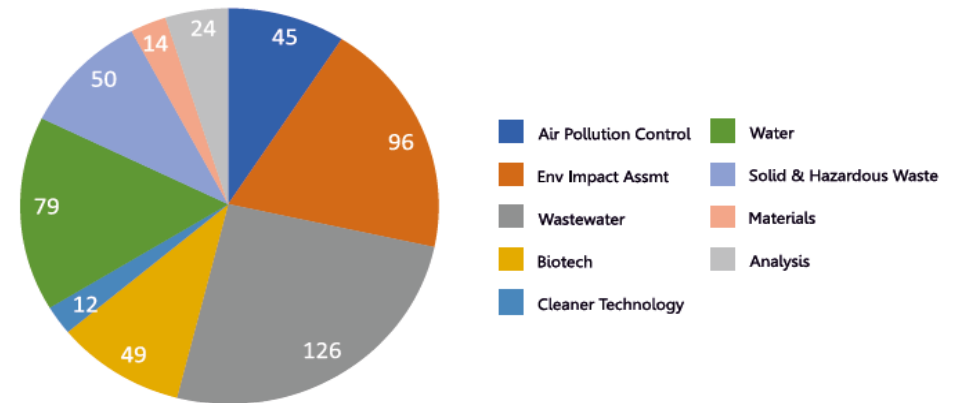
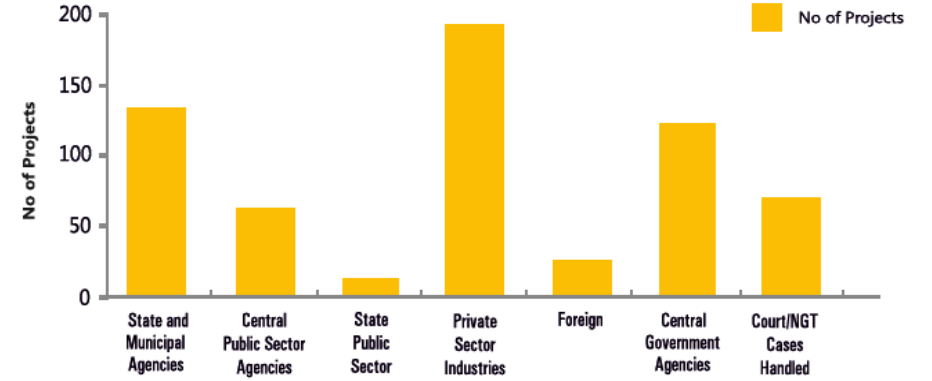
CSIR-NEERI: Pan India Presence

India, as we see it...



Sectoral Presence

* Last five years



Contributing to India's National Missions



Namami Gange

- Special properties of river Ganga
- Monitoring of river water quality
- River rejuvenation through natural treatment systems



Swachh Bharat

- Electrolytic defluoridation
- Iron removal plants
- Phytoid natural water treatment technologies
- Rapid composting
- Menstrual waste management technologies



Swasth Bharat

- Phytoid for sewage treatment
- Air pollution control and health benefits
- Solar water disinfection
- Electrolytic Defluoridation
- Iron removal plants
- Chemo-Defluoridation
- Improved multi-fuel cookstove



Smart Cities

- Water safety plans
- Lake restorations
- Wastewater recycle reuse
- Plantation for degraded lands



National Green Highway Mission

- Strategically designed green belt development

- INDIA (6)
- IRELAND (3)
- SPAIN (3)
- ITALY (3)
- UK (2)
- CYPRUS (1)

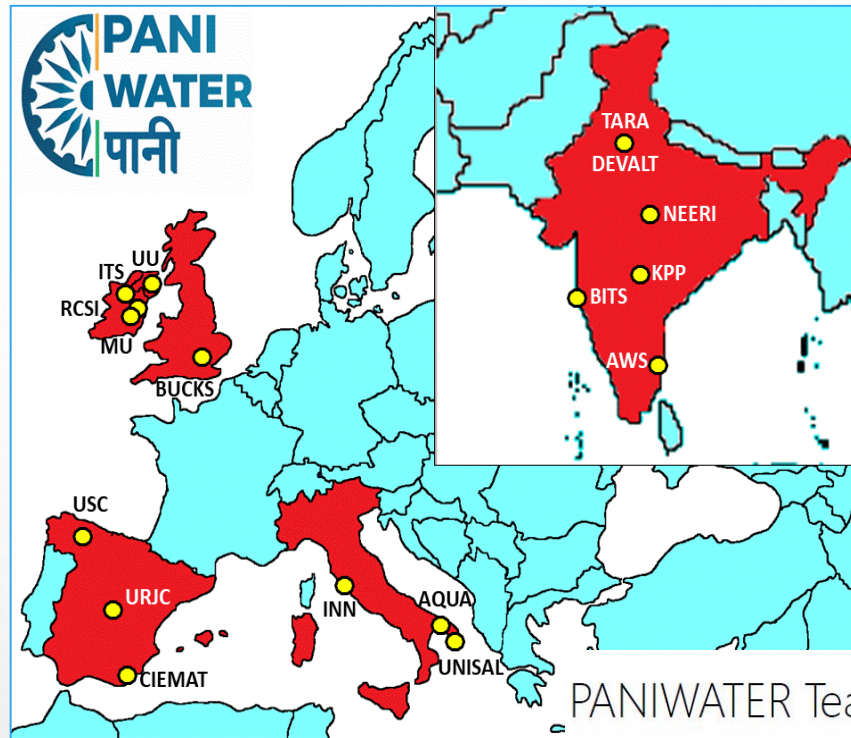
4 YEARS

€4.9M TOTAL JOINT BUDGET

€3.5M EU PROPOSED AND SANCTIONED

€1.316 M INDIA (DST PROPOSED)

€ 0.742 M SANCTIONED FROM DST , INDIA



PANIWATER Team consists of:

- STEM Scientists
- Social Scientists
- Designers
- Entrepreneurs
- Public Health Experts

From:

- NGOs
- Universities & HEIs
- SMEs
- National Research Institutes



INDIA EU WATER COOPERATION

Attractive call for scientists :



- **COLLABORATIONS BETWEEN INDIA AND EU CAN BRING ABOUT RADICAL CHANGES IN SCIENTIFIC UNDERSTANDING OF PROBLEMS IN WATER SECTOR AS WELL AS OTHER ENVIRONMENT SECTORS**

- **FUNDING**

The total budget was of about 30 Mln EUR (15 Mln from Europe and 15 Mln from India) and therefore the funding of at least 5-6 projects with a request between EUR 3 million and EUR 5 millions is expected.

- **Tremendous efforts by EU and DST to publicize the call to increase participation Pan India**
- **Emphasis on technology demonstration (TRL-3-6)**
- **Relevant and wide research areas in water sector**
- **TOPIC : WATER**

1. **DRINKING WATER PURIFICATION WITH A FOCUS ON EMERGING POLLUTANTS**
2. **WASTEWATER TREATMENT WITH SCOPE FOR RESOURCE/ENERGY RECOVERY REUSE RECYCLE AND RAINWATER HARVESTING, INCLUDING BIOREMEDIATION TECHNOLOGIES**
3. **REAL TIME MONITORING AND CONTROL SYSTEMS IN DISTRIBUTION AND TREATMENT SYSTEMS** ⁸

WHY TOPICS APPROPRIATE IN INDIAN CONTEXT



- **Water Scarcity** : Distribution unequal as not all rivers are perennial and dependency on ground water for drinking purposes is increasing in rural areas where water supply is irregular and intermittent
- **Water Quality**: Struggling with drinking water pollutants : iron, fluoride, arsenic, ammonia, toxic metals, point of use microbiological contamination
- 20-30% loss in water supply reported due to leakages thus creating opportunity for recontamination of water during supply .
- Contaminant risk assessment models reqd; SCADA for ESR ; Pressure gauges not available in water supply network
- Effluent discharge standards for inland surface waters, sewers, land for irrigation , coastal waters
- Emerging pollutants an emerging topic, monitoring and remediation technologies required (questions were raised on concern for these pollutants as no stipulated standard for drinking). However, recent Publications have confirmed their presence in surface waters and treated wastewaters and created a widespread awareness.
- Treated wastewater indiscriminately used in irrigation , possibility of bioaccumulation in food produce
- Policy driven recycle and reuse of treated wastewater
- Industrial wastewater either discharged in inland surface water, land or zero liquid discharge

CHALLENGES

- **LONG AND DETAILED FORMAT (TOOK 4 MONTHS TO FINALIZE OBJECTIVES AND FORMULATE 7 WORK PACKAGE WITH 18 COLLABORATORS)**
- **IT WAS A GREAT EXPERIENCE WITH THE SCIENTIFIC COLLABORATORS PUT THEIR IDEAS TO SUCCESSFULLY SUBMIT IN TIME**
- **Results were declared in mid 2018 and final kick off of the project for Indians was on 1st April, 2019**
- **Inordinate delay in the start of the project did not coincide with start date for EU**
- **EU Partners are equipped with full grant and Indians have faced 50-60% budget cuts and delayed release of funds**
- **Unmatched expectations (eg Capacity for water and wastewater treatment plants and no of beneficiaries) and budget**
- **Pressure from EU partners for Deliverables updating but many Indian partners have not received the budget**
- **Agreement between parties inclusive of the above**
- **Opinion : PRE EVALUATION OF PROOF OF CONCEPT : Realistic EXPENDITURE sought , SITES ; Involvement of Govt bodies in the call to smoothen procedure for site selection and processing related paper**

PROJECT EVALUATION

- FAIR AND BALANCED
- TIMELY EVALUATION AND DECLARATION OF RESULTS
- TRANSPARENT
- EFFICIENT
- REVIEWERS APPROPRIATE AND RELATED

Basis of evaluation / Strength of the proposal

- EXCELLENCE /RELATION OF PROPOSAL TO WORK PROGRAMME / STATE OF THE ART TECHNOLOGIES (PRIOR ART) / PRELIMINARY PATENT LANDSCAPING OVERVIEW AND LIST OF PATENTS TO MONITOR
- ORIGINAL ASPECTS OF PROPOSAL LEADING TO ADVANCES BEYOND CURRENT STATE OF THE ART
- EXPECTED IMPACTS, RELATION BETWEEN PROPOSAL AND SDGs
- ADDITIONAL IMPACTS AND MEASURES TO MAXIMISE IMPACTS
- ENVISAGED BUSINESS MODEL , POTENTIAL BARRIERS OF COMMERCIALIZATION , COMMUNICATION STRATEGY
- IMPLEMENTATION OF WORK PACKAGES

PROJECT EVALUATION



- DETAILED FORMAT AND SKILLFUL WRITING SKILLS AND PRESENTATION REQUIRED VIS A VIS SCIENTIFIC EXCELLENCE/MERIT AND GU OF TECHNOLOGY
- VERY STIFF COMPETITIVE EVALUATION (5 DECLARED SUCCESSFUL OUT OF 64) 4 PROPOSAL HAVE CSIR-NEERI AS AN INDIAN PARTNER , OUT OF WHICH ONE AS INDIAN COORDINATOR
- JOY OF SUCCESS NOT LASTING : HARD WORK NOT COMMENSURATE WITH THE BUDGET ALLOCATION FOR INDIANS AND NOT MATCHING EU BUDGET
- MANY INDIAN PARTNERS HAVE NO MANPOWER AND TRAVEL BUDGETS / WORK PACKAGE LEADERS HAVE NO INTERNATIONAL TRAVEL BUDGET
- STEERING COMMITTEE AND GENERAL ASSEMBLY MEETING WERE CHOSEN SUCH THAT THE EU PARTNERS COULD DEMONSTRATE/ TRAIN RESEARCH STAFF
- EU AND DST, INDIA COULD BETTER ESTABLISH THE TERMS OF THE COOPERATION
- REVIEWERS (DST and EU) WORKSHOP TO BE ON THE SAME PAGE AND THEIR DECISIONS SHOULD INCLUDE INDIAN AND EU QUERIES TOGETHER PRIOR/DURING AFTER EVALUATION (deliverables are related , technologies are as a result of Co-creation, Co-design and co-production between India & EU
- WHETHER PROJECT EVALUATION INCLUDED FINANCE/BUDGET JUSTIFICATION ?
- DST WEBSITE SHOULD ALSO HAVE REVIEWING CRITERIA (EG. EXCELLENCE, IMPACT, QUALITY AND EFFICIENCY OF IMPLEMENTATION, GENDER BALANCE ETC
- ESSENTIAL TO AVOID REEVALUATION AND RE REVIEWS AND BUDGET CUTS AFTER PROPOSAL APPROVED BY EC RE REVIEWING AFTER DECLARATION OF SUCCESS ONLY DAMPENS SPIRIT AND ENTHUSIASM OF THE RESEARCH
- SINCE ALL BUDGET WAS JUSTIFIED DURING 4 REVIEW MEETING , THE BUDGET WAS AGREED UPON KEEPING IN VIEW THE ENVISAGED DELIVERABLES WHILE WRITING THE PROPOSAL
- ALL FUNDING RECEIVED HAVE TO SUBMIT UTILISATION CERTIFICATE SO CANNOT BE MISUSED

CHALLENGES



- EU WEBSITE TAKES A WHILE TO GET USED IT (TUTORIALS ARE HELPFUL)
- LEAR UPLOADING/ CONSORTIA AGREEMENT : LEGAL CELL FOR PROTECTING RIGHTS NOT CLEAR TO INDIANS AS DST FUNDED PROJECT AND DST WOULD DEAL WITH PATENTS APPLICATION AND RETENTION
- **OPINION : EU AND DST, INDIA CAN DEAL WITH THIS TOGETHER AS INDIAN PARTNERS BOUND BY DST REGULATIONS AND FUNDING , EG : IF DST SAYS CSIR IS A LEGAL ENTITY THEN IT CAN BE AGREED UPON**
- ALL SCIENTIFIC PARTNERS SHOULD FOCUS ON TECHNOLOGY DEMONSTRATION , DISSEMINATION AND COMMERCIALIZATION
- CRITERIA FOR EVALUATION INCLUSIVE OF BUDGET AND IF SO, NO BUDGET CUTS
- **JUSTIFICATION OF BUDGET WAS INCLUDED IN PROPOSAL**
- LOTS OF EMPHASIS ON **SCALE** OF TECHNOLOGY DEMONSTRATION RATHER THAN SCIENTIFIC MERIT AND POSSIBLE SUCCESS
- JOINT REVIEW AND PRESENTATION BY COORDINATORS FOR EVALUATION, IF ANY
- RE-EVALUATION AND RE-BUDGETING AND RE-VISITING PROPOSAL AFTER DECLARATION OF RESULTS IS DEFINITELY **A NO NO** : DISCOURAGES SCIENTISTS AND LOSS OF FOCUS/INTEREST IN PARTNERS

LOTUS

Co-creation of innovative low cost technology for water challenges in India

- Development of
 - an **innovative sensor** capable of measuring several contaminants with one chip, 24/7
 - tailor-made **decision support tools** (dashboard, automatic water treatment...)
- **Co-creation, Co-design** and **co-production** between India & EU
- **Implementation in five different case-studies**

Guwahati city
water system
management.

Tanker-based
water
distribution
system.

Irrigation
system
management

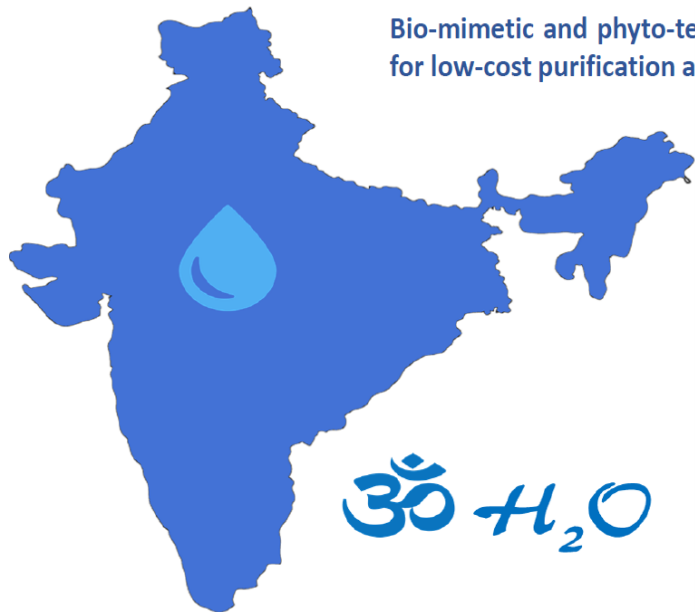
Ground/river
water
monitoring
system

Monitoring and
control of algae-
based waste-
water treatment



INDIA-H₂O

Bio-mimetic and phyto-technologies designed for low-cost purification and water recycling



ॐ H₂O

www.india-h2o.eu



EU-India Water Project – 2019 to 2022



PAVITRA GANGA - 'GIVING BALANCE'

UNLOCKING **WASTEWATER TREATMENT, WATER RE-USE AND RESOURCE RECOVERY** OPPORTUNITIES FOR URBAN AND PERI-URBAN AREAS IN **INDIA**

Waste water treatment & Resource recovery

Water Governance

Smart Water Management

Two urban open innovation sites: Barapullah Drain (New Delhi) and Jajmau Standard Treatment Plant (Kanpur)

thank
you