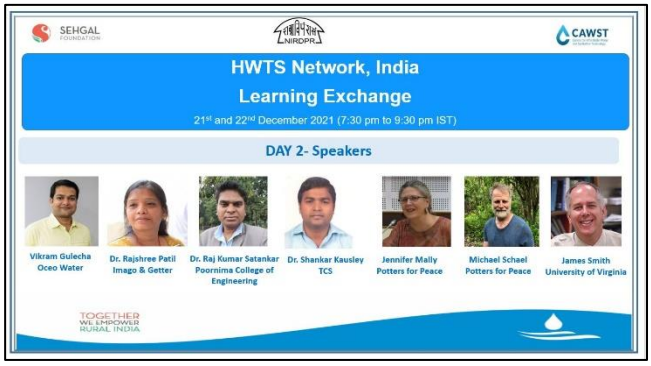
HWTS Network, India

Learning Exchange

December 21–22, 2021



Introduction

HWTS Network, India, hosted a Learning Exchange in partnership with Center for Affordable Water and Sanitation Technology (CAWST), Canada, and National Institute of Rural Development and Panchayati Raj (NIRDPR), India. The Learning Exchange was held virtually on Zoom platform on December 21–22, 2021 to facilitate the sharing of experiences and challenges faced by members, technological updates, and for the development of action plans on integrated approaches to household water treatment and safe storage (HWTS) and for strengthening network.

Government officials, project implementers, academia, corporates, national and international NGOs and researchers from all parts of India and those from different parts of globe interested in promotion of HWTS in India were present. Dr. Marcio Botto represented the Global HWTS Network (promoted by WHO, University of North Carolina, and CAWST).

The meeting commenced with a welcome address by Ms. Anjali Makhija, COO of S M Sehgal Foundation, India. She described the network vision and its alignment with the foundation's vision that every Indian should have access to safe drinking water. The network vision contributes to the expansion of safe drinking water coverage in India in rural and remote regions and peri-urban areas, focusing on the poorest of the poor marginalized sections of the community.

Special remarks were conveyed by Mr. Mohammad Khan from National Institute of Rural Development and Panchayati Raj (NIRDPR), India. He mentioned two major decisions in the formation of HWTS Network in India and the development of a policy brief. He explained the objective of the network set jointly, emphasizing the spread of knowledge and building the capacity of the members around the latest technologies, products, research, and project implementation.

HWTS Network, India Update (Jan–Dec'21)

Activities carried out during 2021 were shared. Highlights:

1. Capacity building:
    - Webinars: 5
        - Attendees: 155 males/46 females
    - Training workshops: 3
        - Attendees: 89 males/28 females
    - HWTS virtual courses: 2
        - Participants: 210 registrants
    - Water knowledge exchange: 1
        - Attendees: 44
    - Consultation to HWTS members
        - In person: 14
        - Remote: 34
2. International achievement: The network showcased the innovations on BSF technology at an international conference: UNC Water and Health 2021 organized by University of North Carolina (https://youtu.be/q98c5scUlIY)
3. Proud collaboration: TERI SAS (earlier known as TERI University) is a reputed institution in the field of environmental studies, founded by TATA Group, and working presently as an autonomous institution. TERI SAS became the first university in India to recognize household water treatment and safe storage. A certificate course, Introduction to HWTS, is in progress.

Learning Exchange Proceedings

Following HWTS Network, members volunteered for delivering presentations in the Learning Exchange sessions:

Speaker	Organization/Institution	Topic
Uday Shankar	Water Aid	Knowledge, Attitude, and Practices (KAP), Situation Analysis
Chandni Bedi	Navjyoti India Foundation	Women's Waterpreneurship: Success, Challenges, and Way Forward
Kaylea Brase Menon	Pure Paani	Understanding Market Challenges and Opportunities for HWTS Products
Akshay Roongta	Ooloi Labs	Virtual Training of Field Staff and Communities: Experiences and Opportunities
Rakesh Kumar Pandey	Shramik Bharti	Experience Promoting JalKalp, A Sustainable Solution to Clean Drinking Water in Kanpur
Preeti Chauhan	Little Green World	The Unexpected Story of Ladakh
Vikram Gulecha	Oceo Waters	Innovation and Management
Dr. Rajshree Patil	Imago and Getter	Development of Microporous Disc, using rice husk ash and clay for removing protozoan cysts from drinking water
Dr. Raj Kumar Satankar	Poornima College of Engineering	Expansion of Clay Ceramic Water Filter Technology in India: opportunities and challenges
Dr. Shankar Kausley	TCS	Simple Interventions for Providing Safe Drinking Water to Indian Households
Jennifer Mally/Michael Schael	Potters for Peace	Experience of Setting Up New CPF Production Unit
James Smith	University of Virginia	Madidrop: A Simple Solution for Safe Water
Marcio Botto	CAWST	Linking Global and Indian HWTS Network

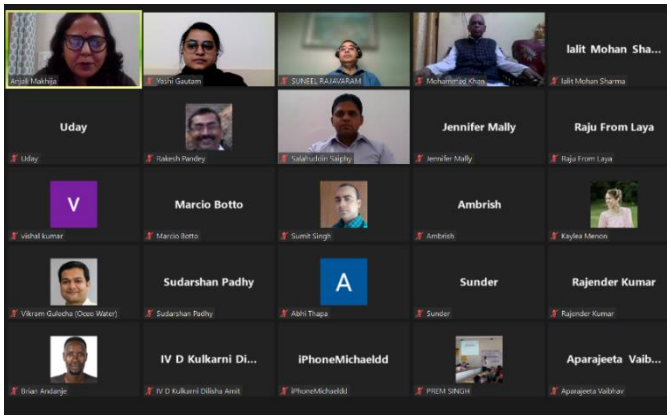
The Learning Exchange concluded with a group discussion on Strengthening the Network to Serve the Need. The discussion on the following questions was facilitated by Lalit Mohan Sharma, S M Sehgal Foundation. Key speakers for the discussion were Suneel Rajavaram from CAWST, Dr.

Marcio Botto from Global HWTS Network, and Dr. Sunderrajan Krishnan from INREM Foundation:

- How would you like to contribute your time to HWTS Network?
- Would you like to be interviewed for the next HWTS newsletter?
- We are looking for volunteers to present their ground experiences with HWTS Network members. Would you like to do that?
- What support do you expect from the network?

Registration: There 87 registrations for the Learning Exchange (12 females/75 were males). Registrations were from eight countries (Bangladesh, Canada, India, Pakistan, Nigeria, Kenya, Nepal, and USA) and from different backgrounds (community-based organizations/ non-profit charity organizations/academia/INGO/students and volunteers). Sixty-two Indian participants joined from eighteen states. Seven registrants were from S M Sehgal Foundation.

Glimpses of Learning Exchange



Compendium of Abstracts

Knowledge, Attitude, and Practices (KAP) Situation Analysis
Uday Shankar, Water Aid

Most families in the rural areas and small towns do not use any type of household water treatment system, and a recent survey shows water treatment methods at the households has been limited to 29 percent. The survey, conducted between January–March 2021 covered the households from multiple states in India, aimed to understand knowledge, attitudes, and practices on drinking water treatment and storage methods. It is important here to note that National Family Health Survey (NFHS-4, 2015) showed similar results, as 71 percent of rural households did not treat water before drinking or cooking. Among the population that use a household treatment system, boiling is the most common method, which may be also used along with filtration with cloth. The survey demonstrates that the households that use electricity-based treatment systems have more than doubled those using non-electric methods. However, the rapid growth of electric-type treatment systems is limited to certain geographies.

Andhra Pradesh is the only state where HWTS users were in majority (54%) when compared to the non-users. Bihar, Chhattisgarh, Madhya Pradesh, Odisha, and Uttar Pradesh were the other states. The least users were found in Bihar (10%) and the maximum were found in Chhattisgarh (46%).

We have evidence that the districts with known groundwater chemical contaminations use HWTS more commonly, depending upon the severity of the problem and interventions caused by the government and other agencies. Hence such data should be analyzed in a specific geographical context such as within a state boundary.

Assuming all unimproved sources are unsafe, it can be expected that families should be using water-treatment devices. However, the survey reveals that use of water-treatment devices by families has been more when they are accessing improved sources. The propensity to non-use is higher when families accessed unimproved sources. In rural areas and small towns, water storage vessels with lids are popular, and so is the use of a long-hand ladle, but only a few use vessels fitted with taps.

Women Entrepreneurs: Success, Challenges, and Way forward
Chandni Bedi, Navjyoti India Foundation

To make communities self-reliant, Navjyoti India Foundation has been empowering women regarding social and economic issues for more than three decades. In this context, rural women

were trained on biosand filters, with the support of S M Sehgal Foundation and CAWST, to address the issue of waterborne diseases. Two rural women were recognized and awarded globally by Women's World Summit Foundation, Geneva, for their efforts to provide safe drinking water to communities, using the technology that was appropriate, affordable, and sustainable despite all challenges faced by them. The patriarchal mindset and mobility issues were a major hindrance. The initial success was impeded by the lack of awareness in the communities on safe drinking water, non-acceptance of technology due to use of sand and gravel as the raw material, competitions from other filters on design, and the cost. Women started door-to-door awareness, connecting with potential customers, referral linkages, and sensitizing children in the schools to promote the cause. Collaborative support from various stakeholders led to the access of this technique for 144 households. The women finalized the name of their campaign as PaniCan and aspire to register this as a company. They have started receiving demands from the urban areas as well. However, the design and size of the filters can be improved for better acceptance, including nuclear and small families. To make waterpreneurship a success, a holistic program needs to be designed to train them as WASH ambassadors. Brainstorming is needed with like-minded individuals promoting HWTS to scale this up so that more communities adopt this technique.

Market challenges and opportunities for HWTS
Kaylea Brase Menon, PurePaani

Improving access to HWTS products and services for marginalized communities is critical for achieving sustainable development and social inclusion. Unfortunately, many technologies that have been designed for low-income consumers have not obtained widespread acceptance and sustained use. In order to improve the rate of adoption, social-impact organizations must first understand the many factors that influence choices are made by "base of the pyramid" consumers; then they must design interventions to address the challenges and leverage the opportunities in the market. This presentation will explore the process of consumer valuation and adoption of HWTS products and the corresponding barriers that consumers and businesses face. In addition, the presentation will include a case study of how Pure Paani, a social impact startup, is facing difficulties and opportunities in the process of providing affordable and portable water purifiers to vulnerable communities. A research framework has been developed to investigate how Pure Paani can improve their product adoption. Finally, ideas and guidelines for further research were discussed.

Leveraging Virtual Training of Field Staff and Communities: Experiences and Opportunities
Akshay Roongta, Ooloi Labs

Presentation laid out the basics of what makes virtual training approaches powerful if adopted, not just as a stop gap during lockdowns, but in the longer run. Three case studies showed how virtual training is being used by partners in the ForWater Network across India with a variety of different

types of learners and topics. Also shared were some upcoming capacity-building opportunities being supported by Arghyam, the ForWater Collective, facilitated by Ooloi Labs.

The Unexpected Story of Ladakh, India
Preeti Chauhan, Little green World

Ladakh falls under the Trans-Himalayan region of India and has a fragile mountain-desert ecosystem. Himalayas, which are considered to have pure water full of mineral, has been polluted over the years due to various causes.

Ladakh became popular for domestic tourists post the release of famous Bollywood movie *3 Idiots*. The movie definitely brought economic prosperity for the region but also brought unexpected, wicked problems for the region. Ladakh, which only received mindful foreign tourists who stayed for a month or more, now receives domestic tourists who only wish to visit famous touristy places, such as Pangong Lake and Nubra Valley, with an average stay of one week.

Domestic tourists looked for more comfort rather than actual experiencing Ladakh in its original form. This resulted in making water available for tourists all the time and resulted in the import of packaged water bottles, packaged food, and many other facilities.

This water requirement by tourists resulted in heavy dependency on groundwater and caused groundwater contamination due heavy use of flush toilets and poor sewage systems. The high usage of packaged drinking water and other products resulted in a waste management crisis.

We are focusing on reducing the packaged bottle usage and providing safe drinking water. Biosand water filters (BSFs), which mostly use locally available resources, do not require electricity to operate and has negligible maintenance. The efficiency of the BSF is achieved by a microorganism layer, called “biolayer,” that forms naturally in BSF, and survives in temperatures from 15–20ºC. Ladakh’s temperature drops down to -20 to -25ºC in winter, which makes it difficult to work efficiently.

Innovation and Management
Vikram Gulecha, Oceo Water

For most in the tech world, the word “innovation” evokes the idea of the latest IT device, app, or online service. People often perceive success by how many novel and attention-grabbing products a company has created. While not meaning to diminish the tremendous influence of the Samsungs and Apples of the world, churning out new gadgets that we subsequently can’t live without, the definition of innovation shouldn’t be limited to inventing a new product. In reality, innovation extends much further.Many devices such as smart home hubs, smart televisions, smart ovens, and many more are reaching consumers on a daily basis.

Perhaps it's time to consider a product that has been overlooked so far—a smart water purifier that is responsible for dispensing daily drinking water in a household. Its importance and necessity rivals any other products in any household.

Microporous Disc Using Rice Husk Ash and Clay for Removing Protozoan Cysts from Drinking Water
Dr. Rajshree Patil, Imago & Getter

Protozoan cysts, which cause watery diarrheal disease, including cryptosporidiosis and giardiasis, are the toughest microbes resistant to most disinfectants. Due to their high resistance against disinfection action, very few household purification devices offer protection against them. The present study describes a simple and inexpensive way to develop a purification media in the form of a compact porous disc suitable to incorporate in the household purification system to trap protozoan cysts. This compact disc is fabricated, using a mixture of rice husk ash (RHA) and clay. The study found that the major parameters of the process, such as particle size of RHA, the ratio of RHA in the fabrication mixture, and the sintering temperature, contribute significantly to the tortuous porous network formed within the disc. The required porosity within the purification media for trapping cysts particles of sizes in the range of 3–5 µm was achieved by employing different combinations of these parameters. The cyst-trapping performance of the disc was evaluated as per the NSF 53 guidelines by using fluorescent microsphere beads as a surrogate to cysts. The optimized configuration of the disc demonstrates; three log reductions of cyst-sized particles.

Expansion of Clay Ceramic Water Filter Technology in India: Opportunities and Challenges
Dr. Raj Kumar Satankar, Poornima College of Engineering

Microbes and particulates are frequently found in drinking water. The contaminated drinking water is poured into the baked, salted clay frustum-shaped G-filter receptacle. Water percolates through the micro-nano porous receptacle due to gravity. The water that has percolated can be collected in a container and consumed. The basic materials for these filters are clay and sawdust, which are blended in an equal volumetric proportion to make the combination. The mixing technique is very similar to how potters make earthen pots. When the wet mixture is crushed with a molding machine, the emergence of certain pores, following the sintering process, is optimized. The traditional baking method (open-hearth kiln or open firing) allows the sawdust to completely burn, which aids in the formation of these pores. Through such filters, an average of ten liters of water percolates in eight hours. This baked-clay water-filtration method is effective in removing microbiological (e. coli and bacteria), turbidity, and other organic and inorganic pollutants from drinking water at the point of use. Researchers from IIT Jodhpur have been working on establishing a collaborative network for clay ceramic water filter research, training, and distribution across the country. Even during the epidemic, team members took part in a variety of events and shared their knowledge on an online platform to teach others about the technology. With the help of the

government and other supporting agencies, more than 500 filters were provided to the local community as part of an expansion effort. One stumbling block to the long-term viability of clay ceramic water filters is whether locals are prepared to pay for G-filters when other drinking water options are available. This necessitated extra effort in order for everyone in the rural area to have access to safe drinking water.

Simple Interventions for Providing Safe Drinking Water to Indian Households
Dr. Shankar Kausley

Providing safe drinking water to its citizens is one of India's major challenges. The presentation gave details of a portfolio of low-cost water purification solutions developed at TCS Research for the removal of microbial as well as inorganic contaminants such as arsenic and fluoride from the water. These solutions include Tata Swach, compact water purification cartridges, arsenic removal filters, fluoride removal filters, the Shudh purification pen, and the three-in-one modular water filter. They can purify the water, meeting the international standards while requiring negligible intervention by the end-user. Further, these solutions are inexpensive and designed to be suitable for deployment in low-income rural as well as urban households.

About HWTS Network, India

Vision
All Indians must consume affordable safe drinking water.

Goal
Network shall contribute to increased safe drinking water coverage in India, specifically in rural, remote, and peri-urban areas, with a focus on the poorest of poor people through the implementation of household water treatment.

Objective
To increase knowledge and build capacities of members on appropriate and affordable HWTS technologies, products, research, and HWTS project implementation.

Membership
Organizations working or interested in HWTS for drinking water can join the network for free. It is expected that all members will cooperate and coordinate with S M Sehgal Foundation, the holding secretariat of the network. The Network presently has 186 members.