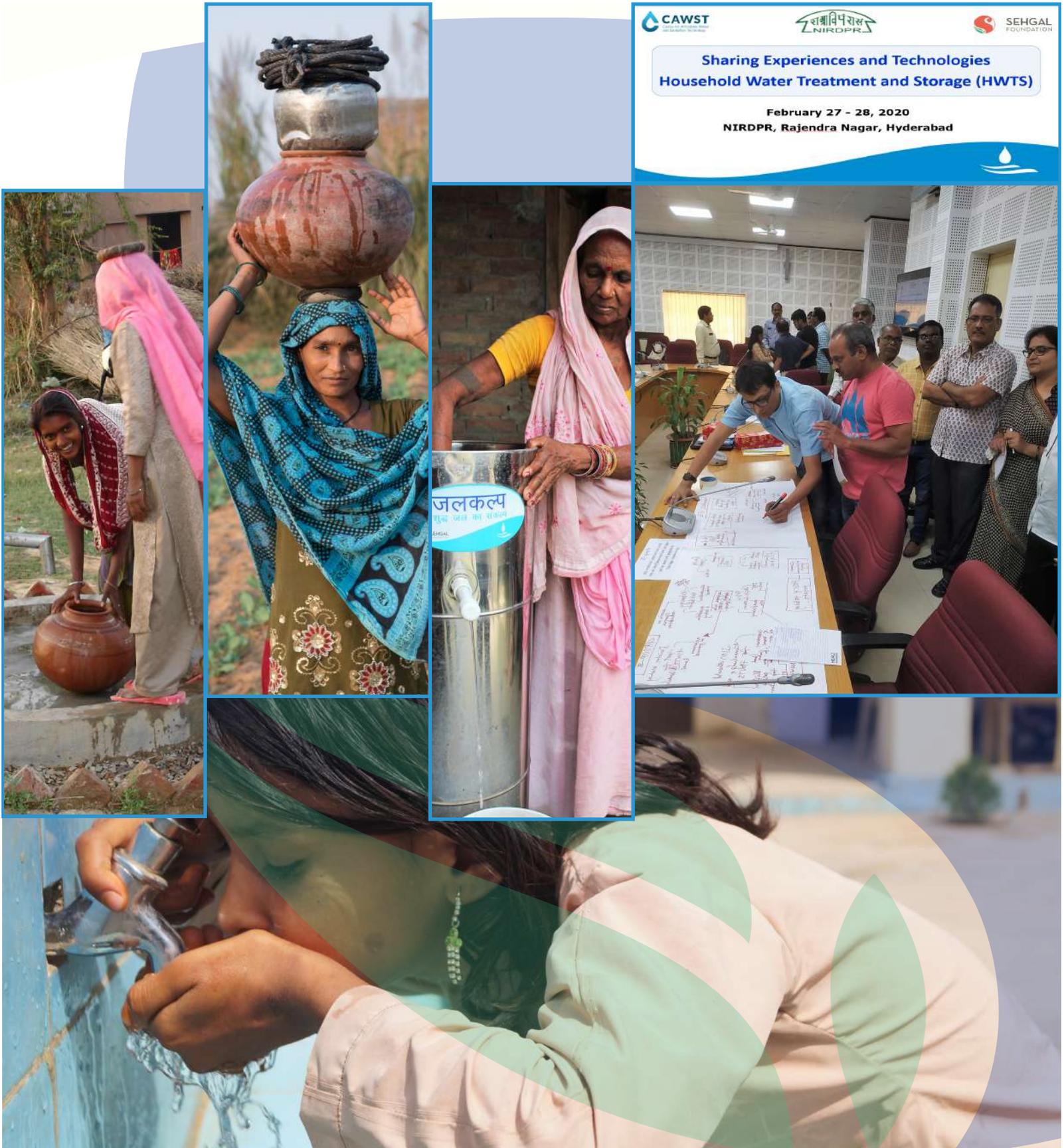




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HOUSEHOLD WATER TREATMENT & STORAGE (HWTS) FOR POTABLE WATER: LEAVING NO ONE BEHIND



Sharing Experiences and Technologies
Household Water Treatment and Storage (HWTS)

February 27 - 28, 2020
NIRDPR, Rajendra Nagar, Hyderabad





The Government of India has recently announced Har Ghar Jal, which will provide functional household tap connection (FHTC) to every rural household by 2024. This is in line with its commitment to achieve Sustainable Development Goal six for achieving universal and equitable access to safe and affordable drinking water for all. However, an important question that remains unanswered is how to ensure that the water at the point of use is safe to drink.

This brief presents suggestions based on the collective experiences of researchers, civil society representatives, policymakers, R&D institutions, and innovators who came together for a consultation convened jointly by National Institute of Rural Development and Panchayati Raj, S M Sehgal Foundation, and CAWST, Canada. The key answers posited as viable, tested, and sustainable solutions are:

- Bring about a policy shift to recognise HWTS as a viable option to make drinking water safe at the point of use.
- Build an ecosystem conducive for development and adoption of HWTS units to treat water for drinking.
- Ensure open access of credible data on water quality through real-time monitoring.
- Recognize access to safe drinking water is a fundamental right and consequentially provide subsidies for eligible beneficiaries and consider tax rebates for making HWTS filters affordable for those in poverty.
- Create Water Extension Centers, similar to Agriculture Extension Centers for effectively promoting and supporting initiatives on water quality and HWTS services.
- Integrate HWTS technologies, innovation, and implementation aspects into the curriculum of courses dealing with water treatment.
- Build partnerships for scaling up and replication of proven solutions.
- Develop programs to achieve compliance in the water sector aimed at long-term commitment and resources for education, training, and knowledge-sharing.
- Engage all stakeholders (university, private, public, and nongovernment sector) to develop a safe drinking water program for India based on technical, economic, social, human health, and environmental aspects, with the main goal to leave no one behind while considering local needs and sustainability.



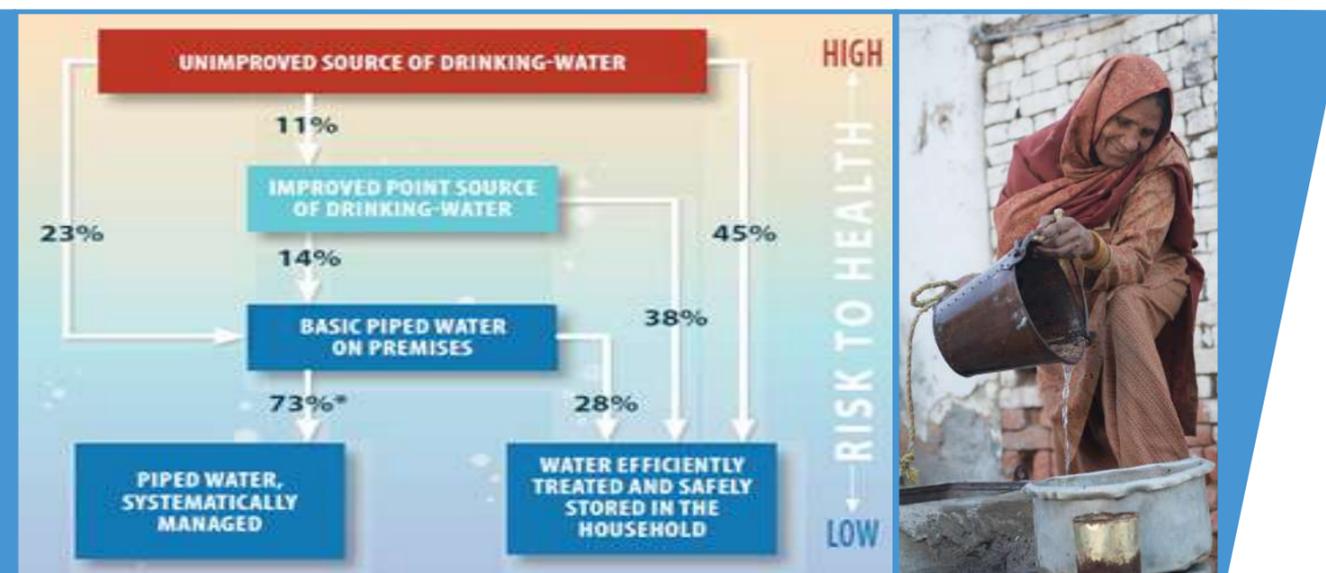
Challenge to Ensure Quality in Drinking Water Delivery Systems

India is the second-most populous country having about 17 percent of world's population, which has just 4 percent of water availability to meet their requirements. As reported, 81 percent of the rural habitations are being served with 40 liters per capita per day (lpcd) of drinking water from improved water sources. (Gol & NITI Aayog, 2019)

Experts and stakeholders in the water supply sector split piped water into two categories: i) a basic piped water on premises, and ii) a systemically managed piped water (continuous and safe supply), recognizing that piped water supply in low-and middle-income countries is often sub-optimal in quality and intermittent in supply requiring storage within the households (WHO, 2014).

A meta-regression study (Wolf et al., 2014) has quantified the reductions in diarrhoeal disease that could be achieved through different transitions moving from lower to higher service level categories. It has been pointed out that switching from an unimproved source of drinking-water to basic piped water on premises helps in reducing the risk of diarrhoeal disease by 23 percent, while water supply which is efficiently treated and safely stored in the households showed a disease reduction of 45 percent. (Figure 1)

Figure 1: Drinking-water supply transitions and associated reductions in diarrhoeal disease risks



*These estimates are based on limited evidence and should therefore be considered as preliminary and have not been used in the estimation of disease burden. Source: WHO, 2014.

SDG six targets universal access to affordable and safe drinking water, instead of improved water, by 2030. Despite the availability of adequate resources, the ten-year period may be inadequate to transform this into reality given the inherent issues and pace of implementation that the water sector has witnessed in the past. This however seems feasible in the Indian context with new initiatives such as Jal Jeevan Mission wherein the community-managed water supply systems proposed only need to be supplemented with HWTS to ensure desired quality at the point of use.

Centralized Treatment vs. Household Water Treatment Systems

The National Rural Drinking Water Programme launched by the Government of India in 2009 envisions enabling access to piped water supply in 90 percent of rural households by 2022. In this pursuit, the Ministry of Drinking Water and Sanitation (MDWS) in collaboration with UNICEF created a Drinking Water Advocacy and Communications Strategy Framework that was launched in 2013 that listed activities, knowledge, and interventions needed at different levels to ensure the attainment of safe and sustained water sources. At the household level, the framework highlights safe handling and use of HWTS as important dimensions in rationalizing the vision of the program (MDWS and UNICEF, 2013).

Alongside this, the Ministry launched another report in the same year which recognized that the cost of providing low cost HWTS is half the cost of providing conventional source-based interventions, and that the public sector is bound to recover more than the full cost of implementation from reduced health costs for disease treatment (CSIR-NEERI, 2013).

Despite the recognition of HWTS being an important element in resolving the issues around access to safe drinking water and achieving the vision of safe drinking water at point of use back in 2013, the ambitious Jal Jeevan Mission implementation strategy even in 2020 fails to recognize the importance of HWTS, thus leaving the scope that the intended beneficiaries under the scheme may or may not have access to water that is safe to drink.

HWTS technologies offer great potential in the effective treatment of water contamination and protecting the health, overall development, and productivity of the users (Bartram, 2001). HWTS as an alternative or supplement with centralized treatment has many advantages like sustainability (user is the owner), simple technology, economical, easy to operate and maintain, and reduced chance of secondary contaminations/ infections. It is evident that even in regions that are affected by various water quality issues such as fluoride and arsenic, HWTS is the solution. For instance, the JalKalp water filter (promoted by Sehgal Foundation in Bihar) is a good example of HWTS and is effective in addressing contaminants such as arsenic, iron, manganese, biological contamination, and turbidity simultaneously.

However, it is often noticed that the community-based water-treatment systems fail due to the following reasons:

- Lack of community participation in operation and management of community-level plants.
- Lack of awareness among communities on water quality and treatment aspects.
- Inadequate resources to undertake timely maintenance and service requirements of the

- plants.
- Lack of training and skills to maintain the plants.
- Poor socioeconomic conditions of the families to contribute toward operation and management of community-based water treatment plants.

Key Recommendations

This policy brief presents evidence-based, experiential and grassroots-driven recommendations emanating from years of on-the-ground experience to improve the access and availability of safe drinking water. Recommendations are divided into the following three categories:

- 1) **Build an Ecosystem for Promotion of HWTS**
 - o Make credible and layered data on water quality available to public (both at source and point-of-use level).
 - o Support innovators for carrying out location and problem-specific effective innovations on HWTS.
 - o Exempt Goods and Services Tax (GST) of HWTS systems meant for the bottom of pyramid.
 - o Consider incentives for eligible beneficiaries through subsidies.
- 2) **Generate Sustainable Demand through Grass roots Extension**
 - o Create a people's movement for mass awareness on the importance of safe treatment of drinking water before consumption alongside highlighting the utility and imperativeness of HWTS.
 - o Incentivize micro entrepreneurs and microfinance institutions to support adoption of HWTS through extending special loans.
 - o Build capacities of local village councils to create Water Safety Plans suited to their local contexts and handhold them to implement these plans.
 - o Identify HWTS systems that can be promoted in quality-affected regions and incorporate strategies for their promotion as part of the water supply programs.



- o Create Water Extension Centers similar to Agriculture Extension Centers to create awareness and provide technical support for ensuring clean drinking water at the point of use.

3) Build Partnerships for Scaling up Proven Solutions

- o Integrate HWTS technology, innovation, and implementation aspects into the curriculum of courses dealing with water management at the household and community levels in the realm of social development, etc.
- o Create a network of HWTS promoters, technology developers, and providers from across India on the lines of International Network on Household Water Treatment and Safe Storage.

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