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**Implementing household water treatment interventions:
actors and factors for success**

E. Ojomo, M. Elliott, M. Forson & J. Bartram, USA

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Despite the years of effort of organizations to scale up household water treatment and safe storage (HWTS) practices, HWTS practices are yet to achieve scale. PATH, UNICEF, and the Water Institute at UNC Chapel Hill collaborated to carry out a study aimed at determining the factors relevant to scaling up and sustaining HWTS practices. The main objective of the study was to produce useful and practical tools that could be used by organizations to effectively plan and implement HWTS interventions. This goal was achieved by interviewing HWTS practitioners with experience in dozens of countries and a variety of settings. The study identified six dimensions of a program essential to scale-up and sustainability: (1) Capacity building; (2) Resource availability; (3) Standards, regulations & legislation; (4) Integration and collaboration; (5) User preferences; and (6) Market strategies. Assessment tools were also developed to guide organizations in planning and implementing HWTS interventions.

Study overview

In 2012, PATH – an international non-profit organization, UNICEF and the Water Institute at the University of North Carolina at Chapel Hill (UNC) collaborated on a global study to determine the enablers and barriers to effective implementation of household water treatment and safe storage (HWTS) intervention. The study aimed to produce useful and practical tools that could easily be used by practitioners in the field. As a result, in addition to determining the enablers and barriers to scaling up and sustaining HWTS interventions, assessment tools were developed to aid organizations in implementing HWTS interventions. This study adds to the limited body of knowledge available on effective ways to scale up and sustain HWTS practices and is relevant because despite evidence that HWTS practices are effective in reducing diarrheal diseases, centuries of practice by individuals, and years of advocacy and implementation efforts by non-governmental organizations (NGOs), HWTS practices are yet to achieve scale (Clasen, 2008). The improvements in microbiology of water quality and reduction in diarrheal disease as a result of HWTS practices makes scaling up and sustaining HWTS practices important for public health (Sobsey, 2002). The study began in 2012 and is currently in the dissemination phase.

Completed activities

Interviews, focus groups and surveys

Interviews, focus groups and online surveys were the main methods used to determine the enablers and barriers to effective HWTS interventions. These were appropriate methods for two reasons: there is currently limited research on factors relevant to successful HWTS interventions and these methods allowed the interviewer to ask interviewees to respond based solely on experiences rather than perceptions.

Semi-structured in-person, telephone, and Skype interviews, focus group discussions, and online surveys were conducted with participants. Participants were instructed to give responses based solely on experiences with examples to back up responses. In addition to questions on factors that had enabled and hindered intervention process, questions on the role of gender and culture were also posed. Interviewees were recruited at the 2011 Water and Health Conference which took place in North Carolina in October 2011 and

through the WHO and UNICEF co-hosted HWTS Network listserv. A total of 79 interviews were carried out and participants comprised HWTS implementers, government officials, HWTS manufacturers and HWTS wholesalers and retailers. 64 of the interviewees carried out interventions in Africa, 24 in Asia, 14 in Latin America, and 9 in North America or other regions. Several of the interviewees were directly involved in interventions in multiple regions.

Analysis using framework

The analysis of interactions between and among institutions and individual actors can benefit greatly from the use of a framework. Frameworks help to identify “the elements and general relationships among these elements,” the understanding of which are essential for “diagnostic and prescriptive inquiry” (Ostrom, 2011). The Institutional Analysis and Development (IAD) Framework was used to analyse the responses from the interviews. The IAD framework was developed by Elinor Ostrom and outlines a systematic approach to analyse institutions and the actions that govern their interactions. There are three main components of the framework: external variables – elements outside an actor’s control that influence the decisions of different actors; action arena – refers to actors and the social space where individuals interact; and patterns of interactions and outcomes – relationship between action arenas. The interviews shed light on the numerous and interrelated factors relevant to implementing effective HWTS interventions. This framework was developed to maximise comprehensive analysis and decrease bias and was used to achieve this comprehensiveness. The IAD framework was chosen because it provides an organized way to assess the enablers and barriers and helps to systematically analyse actors relevant to scaling up and sustaining HWTS practices.

Study results

Factors

The analysis of the responses from the interviews yielded 24 distinct enablers and 27 distinct barriers to scaling up and sustaining HWTS practices. This was not surprising as the interviewees had carried out HWTS interventions in 25 countries under different setting and context is known to play a critical role in the effective implementation of interventions. The numbers of enablers and barriers were managed by grouping enablers with their counterpart barriers. For example, “affordable products” was mentioned as an enabler and “cost of products” was mentioned as a barrier so these were grouped into “technology cost” as a factor that is critical to scaling up and sustaining HWTS practices. The top ten most frequently are given below along with the number of times they were identified during interviews:

- Demand for HWTS – 29
- Fostering partnerships – 23
- Presence of an effective supply chain - 22
- User preferences - 20
- Favourable political climate – 17
- Affordable technology - 15
- Training on HWTS practices - 12
- Available resources – 12
- Standards to ensure effective technology - 9
- Integrating HWTS into other programs – 8

Due to the role of context in influencing the success of HWTS practices, it was essential to find a way to account for the other factors that interviewees had mentioned to be critical in their interventions. To do this, each identified factor was assigned to one of six domains. Division into domains was based on the identified factors as well as on similar grouping carried out in previous work (Rehfuess et al. 2014). Interestingly, the top ten factors listed above fit into these six major groups. The domains are:

- Capacity development - refers to the ability of both target individuals/households and organizations to carry out technical activities related to HWTS practices
- Resource availability - refers to the availability of economic and human resources necessary for scaling up and sustaining HWTS practices
- Standards, regulation, and legislation - refers to the formal rules that guide individuals and organizations and are enforced by police and the courts

- Integration and collaboration - refers to partnerships between different actors, institutions, and sectors to promote HWTS practices
- User preferences - refers to the preferences of the target individual, household or community with regard to HWTS practices. This domain does not include ability to pay for products and technologies as that factor is part of “resource availability” domain
- Market strategies - refers to the process used to bring the product to the consumer.

The table below shows the categorization of the top ten factors into these domains.

Table 1. Factors for scaling up and sustaining HWTS practices	
Domains	Interviewee identified factors
Capacity building	Training on HWTS practices
Resource availability	Available resources
Standards, regulation, and legislation	Favourable political climate Standards to ensure effective technology
Integration and collaboration	Integrating HWTS into other programs Fostering partnerships
User preferences	Affordable technology User preferences (e.g. preference for taste)
Market strategies	Created demand for HWTS Effective supply chain

Relevant actors for scaling up and sustaining HWTS practices

After an assessment of the interview responses, one thing stood out - collaboration is important for successfully implementing HWTS interventions. This includes collaboration of the implementing organization with governments and members of the target community, amongst other actors. Numerous actors are actively involved in scaling up and sustaining HWTS practices and the number of actors depends on the HWTS practice being promoted and the context in which it is promoted. Analysis of literature and the interviews identified six actors that are generally involved, regardless of context and HWTS practice. These actors were: implementing organization (e.g. non-government organizations, private sector organizations, governments, etc.), donors, product and technology manufacturers, wholesalers/retailers, governments, and the community.

With the aim of the study being production of results that are practical and useful for HWTS practitioners, we developed a guideline to better understand how to form effective collaborations with the different actors using the IAD framework. With this guideline, practitioners are aware of the different characteristics of other actors that should be considered to facilitate collaboration. In considering actors and facilitating collaboration, it is important to consider:

- Preferences – this refers specifically to preferences of the actors. For example, preference of a product by a targeted household over another
- Aspects of society – this includes factors like culture and social norms
- Resources – this refers to both economic resources and technical/management capacity
- Knowledge – this refers to knowledge about the program, the products, and/or HWTS practices
- Environment – this refers to the physical environment including road coverage, water source turbidity, etc.
- Rules – this refers to the formal rules (e.g. policies, regulations, etc.) that the different actors are governed by.

Development of assessment guides

Using the information obtained from the interviews and the analysis, assessment tools were developed to aid organizations in effective implementation of HWTS programs. Three tools were developed:

1. HWTS technology implementation feasibility assessment tool – this tool assesses the feasibility of employing a particular HWTS product and/or technology in a specific country based on import regulations, supply chain, and available labour
2. Individual and community level assessment tool – this tool guides organizations during the planning and implementation phase of an HWTS intervention and helps the organization determine drivers and deterrents for change that will maximize successful interventions
3. National government level assessment tool – this tool assesses the national governments preparedness to promote and scale up HWTS practices by considering government efforts and policies

Assessment tools

Three assessment guides were developed for this study. These tools were created for organizations interested in carrying out interventions. These assessment tools were tested by presentation at a workshop at the 2012 Water and Health Conference to a diverse group of HWTS practitioners. Over 20 practitioners at the workshop stated that the tools would be useful and they would use them when planning and implementing HWTS interventions. To maximize the effectiveness of the tools, the practitioners were broken up into three groups, with each group in charge of critiquing a particular assessment tool.

Current and future work

Piloting assessment tools

We are planning to pilot the assessment tools in three yet to be decided countries. It is important that they are piloted so that they can be validated. It is envisioned the tools will maximize the likelihood of scaling up and sustaining HWTS practices.

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Contact details

Edema Ojomo
The Water Institute at UNC
University of North Carolina at Chapel Hill
Tel: +1 615-498-7435
Email: ojomo@live.unc.edu

Michael Forson
United Nation's Children Fund
Tel: +1 917-265-4580
Fax: +1 212-326-7129
Email: mforson@unicef.org
www: www.unicef.org