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**ACCESS TO SANITATION AND SAFE WATER:  
GLOBAL PARTNERSHIPS AND LOCAL ACTIONS**

**Sustaining point-of-use (POU) water quality interventions  
in Ghana: The behavioural perspective**

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*In Ghana, diarrhoeal diseases continue to be a major cause of under-five morbidity and mortality, mainly due to faecally-contaminated household water and unhygienic practices. Although the West Africa Water Initiative (WAWI) partnership has attained remarkable success in drilling boreholes and providing alternative improved water sources in intervention communities in the Northern Region, promoting household water treatment and safe storage products and technologies alongside is a cost effective alternative to reducing diarrhoeal and other water-related diseases. This paper outlines the behaviour change perspective for implementing household safe water treatment and storage technologies, based on a literature review. The review highlights the health benefits of point-of-use water products, sources of water supply in WAWI intervention communities, current water treatment and storage practices, the facilitating factors and obstacles to behaviour change.*

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## **Introduction**

The West Africa Water Initiative (WAWI) is a novel partnership model of 13 international organizations of varied backgrounds that works closely with governments and local partners in Ghana, Mali and Niger since 2001 to provide rural water supply and sanitation as the entry point for community development. Objective two of the Initiative is “to reduce the prevalence of water-borne and sanitation-related diseases, particularly trachoma, guinea worm and diarrhoeal diseases through the promotion of personal hygiene and environmental sanitation practices.”

Outcome two of WAWI objective two is to ensure that communities are practicing “appropriate behaviours” for the prevention of these diseases at the household and individual levels. This implies that the hardware, behavioural change and the enabling environment needed for improved water supply, sanitation and hygiene interventions are in synergy.

The health benefits of safe water supply and sanitation facility provision may not be achieved if water collected is not handled safely and latrines provided are not properly utilised. Hence, the need to properly address the key problem of behavioural change in order to reinforce the linkage between improved facilities and sustainability of health impact user practices. The effectiveness of interventions may be measured by changes in behaviours, as it is expected that a change in behaviour will usually result in reduced morbidity and mortality (Curtis, 2000, cited in Shordt, 2006).

It is within this context that the USAID Hygiene Improvement Project (HIP) is supporting field partners of WAWI to strengthen their behaviour change approaches around water, sanitation and hygiene, focusing on three key, high impact and cost effective hygiene practices:

- Washing hands with soap or a close substitute at four critical junctures;
  - After defecation
  - After cleaning a baby’s bottoms
  - Before preparing food and cooking, and
  - Before eating
- Safe disposal of faeces, especially child faeces; and
- Safe storage and treatment of drinking water in the household (at the point-of-use)

This paper has two main objectives. First, to highlight the behavioural change perspective of sustaining point-of-use (POU) water quality interventions in Ghana based on a literature review. Second, to share HIP’s experiences working with the WAWI partnership in the Northern region since April 2007.

### **Point-Of-Use water treatment and storage**

The 2003 Ghana Demographic and Health Survey (GDHS) reported that almost half (46.4%) of rural households lack access to improved drinking water, and diarrhoeal prevalence in the two weeks preceding the DHS was lowest in households that have access to indoor piped water (GSS, NMIMR & ORC Macro, 2004).

Boadi et al. (2005) in a self-reported survey found that lack of or inadequate access to potable water is associated with high prevalence of diarrhoea among children under six years in the Greater Accra Area. Boadi and his colleagues found an association between source of drinking water and prevalence of childhood diarrhoea (during a two-week recall period) as follows; 7.0% among 157 children in households with a private indoor pipe, 17% among 170 children in households accessing water from a shared standpipe and 33% for 154 children in households reporting water vendor as a source of drinking water.

Shier et al. (1996) also reported an association between a high incidence of diarrhoea morbidity and mortality and untreated water among young children in Northern Ghana. Their study revealed evidence of water sources being associated with prevalence of diarrhoeal morbidity (during a one-week recall period) in the hot dry season preceding the rains, with the use of borehole and piped drinking water being associated with lower prevalence.

While the WAWI partnership has attained remarkable success in drilling boreholes and providing alternative improved water sources in intervention communities, promoting household water treatment and safe storage products alongside would be cost effective in reducing diarrhoea, guinea worm and trachoma due to drinking contaminated water (Brown, 2007; Clasen et al., 2007; Grundy et al., 2006; Clasen & Boisson, 2006). In many of these communities, water contamination during collection, transport, storage and use in the household continue to pose serious threat to health (Peletz, 2006).

### **Source of household water**

A 1998 estimate indicated that only 2% of the rural population in Ghana had access to piped water within the home, and the situation remains unchanged because of population increases (GSS, and MI, 1999). In addition, there are wide disparities between regions and within regions (urban vis-à-vis rural areas). People living in the three Northern regions and in rural households are less likely to have access to improved water sources than urban households and people living in southern Ghana. Unprotected water sources such as dams (dugouts), reservoirs, streams, rivers, seasonal ponds and shallow wells appear to be the main sources of drinking water for many rural communities in the Northern Region (CWSA/CIDA, 2001; Peletz, 2006, Johnson, 2007). In a self-reported survey, Peletz (2006) reported that more than half (56 %) of the population in the region does not have access to an improved water source. Water from unimproved sources is usually contaminated by both human and animal excreta and therefore poses disease risks to people.

### **Household water storage and treatment practices**

Water collection and storage practices, especially the choice of water collection and storage containers are fundamental in determining household water quality (Sobsey, 2002). Some safe storage of drinking water practices include: keeping water containers clean and covered, ensuring clean water storage area, and the removal of visible particles in the water.

In the Northern Region and elsewhere in Ghana, water for household use is typically stored in locally made clay pots, plastic and metal containers, jerry cans, or aluminium pots. Some of these storage containers may not have narrow mouths and lids (clay pots, plastic basins and metal drums). In observations, CWSA/CIDA (2001) found that 43% of households in the Northern Region store water in open containers. Though about half (48%) of households observed covered their drinking water, 64% of them share the cup used for drinking water. Again, the study reported that two-thirds (66%) of households observed were likely to contaminate their drinking water in one way or the other – usually through uncovered vessels, dippers exposed to dust and children dipping dirty hands into water containers (CDC, 2006).

Murcott (2006) identified three broad areas of water quality – physical, chemical and microbiological – that can be improved by household water treatment. Physical removal technologies include ceramic and Biosand filters, cloth filters, and coagulation/flocculation technologies. Boiling, solar disinfection (SODIS), and chlorination are examples of technologies that improve the microbiological quality of water. Improving the chemical quality of water may be a bit complicated and thus require special skills at the household level. Some technologies can be combined at multiple levels to achieve improved water quality, for example, combining coagulation and flocculation with a disinfection technology such as chlorination. In addition, safe storage containers can be designed using a standard size storage vessel, with a narrow mouth or opening with a lid, and an easily accessible dispensing device.

### **Facilitating factors of behaviour change**

In structured observations, CWSA/CIDA (2001) reported that 43% of households in the Northern Region, particularly in Guinea worm endemic communities, used cloth filters to treat their drinking water, primarily to remove the guinea worm copepod. Similarly, Peletz (2006), in self-reported responses found that 54% of households reported using cloth filters. Both CWSA/CIDA (2001) and Peletz (2006) found that a few households used other water treatment technologies such as boiling, chlorination and alum.

In a randomised, placebo-controlled, double-blinded, longitudinal study to test the health impact of Aquatabs (chlorine-based water purification tablets) in the Tamale Metropolis, the Centers for Disease Control and Prevention [CDC (2006)] reported that 70 (29%) of households at baseline were filtering their water, 54 (23%) were using alum and 33 (14%) did not use any form of water treatment. The CDC interim report stated that after the five-month intervention study (during which free Aquatabs and placebo tablets were distributed to intervention and control households respectively), household water filtration dropped to 54 (23%), alum use reduced to 16 (7%) and Aquatabs adoption rate was almost universal.

Johnson (2007) identified urban residence and high socio-economic status as factors that may facilitate the quick adoption of point-of-use water treatment products and technologies. Johnson found that many urban households knew that their drinking water was unsafe without treatment and were willing to treat their water.

### **Obstacles to behaviour change**

Working towards behaviour change at multiple levels is an important element in the successful implementation and adoption of point-of-use water quality improvement interventions. However, there could be the tendency for projects to overlook the need to critically analyze obstacles to behaviour change before interventions are implemented.

To promote water treatment products like Aquatabs on large scale, a major behavioural change challenge would be how to convince users that the true intention of introducing the tablet is to make their drinking water safer, and not for hidden agendas like birth control (CDC, 2006). For people to adopt and sustain the use of chlorine-based treatment products, they must believe that the product is safe and effective. Further, users should be comfortable with the taste of treated water.

Other potential obstacles to the promotion of POU technologies in WAWI intervention communities include; high illiteracy and low socio-economic status of many households. Boadi et al. (2005) reported that educated mothers, for instance, were “more exposed to the importance of hygiene, better childcare and feeding practices, and more aware of disease causation factors and preventive measures.” Thus educated mothers are more likely to adopt safe water treatment practices than their illiterate counterparts.

### **Discussion**

The willingness of people to adopt POU technologies will partly be determined by their perceptions of the safety of existing water sources, for instance, whether they consider the source clean and free from germs. Accordingly, finding out respondents’ perceptions about the safety of water sources will provide valuable information on the behavioural obstacles and facilitating factors for adoption of POU interventions.

In addition, habits could be strong barriers to behaviour change, especially among low literate populations. People are likely to say: “we have used this water for generations without serious health problems, and so why should we change now”. Perhaps, it is important for water, sanitation and hygiene formative studies to document how habits could predict behaviours.

### **Recommendations**

The literature suggests dearth of local studies on point-of-use water disinfection products, technologies and behavioural determinants in Ghana.

1. It is recommended that more local qualitative and quantitative studies on these cost effective hygiene practices be conducted.
2. Donor funded programmes, projects and interventions promoting these household water treatment options should strengthen existing partnerships and broaden collaboration with Ghanaian universities and training institutions to develop local research capacities for effective transfer of knowledge.
3. It is necessary for WAWI partners and others to conduct simple formative research studies on point-of-use systems that could provide baseline data for measuring end of programme impact.

Again, the challenge for the WAWI partnership and other groups working in the provision of water and

sanitation is to ensure that improved hygiene behaviours are promoted, adopted and sustained by communities at scale. It makes sense that approaches to water, sanitation and hygiene delivery:

- Focus on a mix of interventions, including POU water treatment and storage;
- Promote underlying benefits that motivate behaviour change; and
- Ensure that behaviour change promotional activities have theoretical bases and a baseline data for monitoring and evaluation.

### Prospects

In April 2007, HIP trained field staff and managers of the expanded WAWI network and their collaborators on a behavioral analysis approach to designing interventions. The aim was to encourage them to incorporate these skills into the development of existing behaviour change activities and further the agreement of a common behavior change strategic approach throughout the partnership.

The process has been very useful in many ways. First, the approach provided a conceptual framework, from which many of the field partners (UNICEF, NewEnergy, and World Vision Ghana) are refocusing their promotional efforts as well as the monitoring and evaluation of those efforts. Second, it is helping the Network and collaborators to refocus their work and define more clearly what practices specific audiences need to adopt and how they intend to promote them; and more importantly the approach has increased the awareness of partners regarding the need to proceed in stages depending on what the barriers are and which small doable actions people may engage in.

What is needed now is for the partnership to continue to look for opportunities for combining elements of the behaviour analysis approach with their existing community mobilization skills to encourage wide dissemination and improve penetration of water, sanitation and high impact hygiene practices, including point-of-use products and technologies, in target communities.

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