MISSION REPORT

Developing a National Plan for Scaling Up Household Water Treatment and Safe Storage

4 December 2007

At the invitation of Dr. Terrence Thompson, Environmental Health Advisor, WHO/SEARO, I visiting the Philippines from 8-17 November, 2007 to work with the federal Department of Health (DoH) to plan and carry out a National Stakeholders Forum on Promoting Household Water Treatment and Safe Storage and to develop a National Plan for Scaling Up Household Water Treatment and Safe Storage in the Philippines.

In preparation for this field work, I reviewed various research papers, reports and other documents on water supplies, water quality, water interventions and waterborne diseases in the Philippines. I also reviewed international statistics and assessments of water coverage and environmental health in the country. Finally, I reviewed various national plans, reports and surveys prepared by the DoH, international organizations and NGOs working in the water sector in the country.

In the course of this field work, also met with and interviewed the following key informants representing the various stakeholders involved in household water treatment interventions:

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I also helped in planning and was a presenter in the National Stakeholders Forum on Promoting Household Water Treatment and Safe Storage held in Manila on 15-16 November 2007. Attendees included more than 80 delegates from national and provincial governmental agencies, UN agencies, NGOs and CBOs, technical advisors, academic and research institutions, and commercial companies that manufacture and sell HWTS products. They heard presentations on and discussed the state of water and waterborne disease in the Philippines, research on the effectiveness and cost-effectiveness of HWTS, case studies involving the implementation of various approaches in the country, and recent successes and challenges in implementing HWTS in other countries. My own presentation was on the research showing the effectiveness and cost-effectiveness of the intervention.
The final afternoon of the workshop was devoted to organizing a national network for promoting household water treatment in the Philippines and establishing a national plan for scaling up the intervention throughout the country. In this connection, I worked with the DoH to propose a structure for the network, lead by a steering committee consisting of representatives from each of the stakeholders. Forum participants accepted the structure and established the steering committee; its initial members were nominated from among those present. Thereafter, forum participants reviewed and agreed on an initial mission statement and a basic structure for the national network. The workshop concluded with a consensus on initial priorities for the national network. These were selected from a list I prepared based on ideas presented during the key informant interviews and at the workshop.

Following the conclusion of the National Stakeholders Forum, I prepared the attached document: Developing a National Plan for Scaling Up Household Water Treatment. The document summarizes the results of the literature review, key informant interviews and workshop. It also establishes the framework for moving forward with household water treatment and storage at the national, regional and local level in the Philippines over the next two years.

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A. Background

1. Water and Waterborne Disease.

Unsafe drinking water, along with poor sanitation and hygiene, are the main contributors to an estimated 4 billion cases of diarrhoeal disease annually, causing 1.8 million deaths, mostly among children under 5 years of age (WHO 2005). Because diarrhoeal diseases inhibit normal ingestion of foods and adsorption of nutrients, continued high morbidity also contributes to malnutrition, a separate cause of significant mortality; it also leads to impaired physical growth and cognitive function, reduced resistance to infection, and potentially long-term gastrointestinal disorders. Contaminated drinking water is also a major source of hepatitis, typhoid and opportunistic infections that attack the immuno-compromised.

In the Philippines, endemic diarrhoeal diseases are the second leading cause of morbidity (DoH 2004). Despite significant progress in case management over the past two decades, diarrhoeal diseases remain a major cause of mortality, especially among young children (DoH 2005). Water- and food-borne cases of diarrhoea (including dysentery and cholera), hepatitis A and typhoid and paratyphoid are also the leading cause of outbreaks investigated by the Department of Health (DoH), adding to the disease burden and requiring costly diversion of scarce health and other resources. Diseases associated with contaminated water also exact a heavy economic load in the Philippines, both on the public health care system for treatment and on persons affected for transport to clinics, medicines and lost productivity.

2. Improving Water Quality

While an estimated 85% of the Philippine population is covered by “improved water supplies”), most supplies consist of protected wells, tube wells, communal standpipes and rainwater harvesting; only 45% (58% urban, 23% rural) of Filipino households are connected to a piped-in distribution system (WHO 2006). According to an assessment by the DoH, while water samples from improved wells were generally free of faecal contamination at the source, most were contaminated at the point of consumption, and over 50% were heavily contaminated (DoH 1995). This is consistent with a large body of research world wide showing that drinking water which is safe at the source is subject to frequent and extensive faecal contamination during collection, storage and use in the home (Wright 2004). Thus, improving water supplies alone will not necessarily meet the Millennium Development Goal (MDG) of halving the portion of the population without sustainable access to safe drinking water.

Providing piped in, disinfected water, to each household is an important long-term goal in preventing waterborne disease. The World Health Organization (WHO) acknowledges, however, that on a global basis, such a solution would entail an investment of tens of billions of dollars each year to connect households at the rate of 300,000 per day. Accordingly, it has called for other approaches while progress is made in improving water infrastructure. Interventions to treat and maintain the microbial quality of water at the household level are among the most promising of these alternatives. This is particularly true in settings, like much of the Philippines, where populations have access to sufficient quantities of water, but where the water is microbiologically unsafe. The WHO-sponsored International Network to Promote Household Water Treatment and Safe Storage (HWTS) coordinates the efforts of all stakeholders to advance HWTS (www.who.int/household_water).
The DoH has recognized the contribution that household water treatment and safe storage can make to improving drinking water quality and preventing disease, both on a routine basis and as part of an emergency response. Building on a long-established programme for household water disinfection with a chlorine stock solution made from high test hypochlorite (HTH), the DoH conducted a two-year pilot to assess household use of a 1.25% solution of sodium hypochlorite for drinking water treatment in response to a suspected cholera outbreak in the Province of Pangasinan in 2004. Results from the pilot showed significant improvements in microbiological water quality, reduced cases of diarrhoea, and high acceptability by users compared to the HTH alternative. After careful review of this and other studies on sodium hypochlorite for routine water treatment, the DoH issued Administrative Order 2007-005 which provided guidance on the use of the 1.25% sodium hypochlorite solution as a method for directly treating water at the household level. The Administrative Order notes that the method will be just one approved method under the DoH Household Water Treatment and Safe Storage Programme and expressly acknowledges that such interventions shall be pursued in order to attain the goals and objectives set by the National Objectives for Health and the MDG for safe water.

B. Selected Approaches to Household Water Treatment

A study commissioned by the WHO identified 37 different products, technologies and approaches used in the microbiological treatment of drinking water in the home (Sobsey 2002). Only a few of these approaches have been rigorously assessed for the microbiological performance and health impact. These proven approaches are summarized below:

1. Chemical Disinfection. Chemical disinfection is the most widely-practised means of treating water at the community level; apart from boiling, it is also the method used most broadly in the home. While a wide range of oxidants are used in treating water, most household-based interventions employ hypochlorous acid derived from liquid sodium hypochlorite, solid calcium hypochlorite or high test hypochlorite (HTH) which are frequently available and affordable. Tablets formed from dichloroisocyanurate (e.g., NaDCC), a leading emergency treatment of drinking water, and novel systems for on-site generation of oxidants such as chlorine dioxide, also have a role in household water treatment. At doses of a few mg/l and contact time of about 30 minutes, free chlorine inactivates more than 99.99% of enteric pathogens, the notable exceptions being Cryptosporidium and Mycobacterium species. Its impact in reducing diarrhoeal diseases has been documented (Arnold 2006). The “Safe Water System (SWS)” is a programmatic chlorination intervention developed by the US Centers for Disease Control and Prevention in response to a cholera outbreak in Latin America. It combines bottles of dilute sodium hypochlorite with safe storage and behaviour change techniques (www.cdc.gov/safewater). Social marketing of dilute sodium hypochlorite for drinking water treatment has generated an estimated 9 million users of the SWS in 19 countries. In the Philippines, commercial production and sale of a 1.25% solution commenced recently following of the DoH Administrative Order 2007-005. Like most other household-based water interventions, however, the hardware must be accompanied by an extensive behavioural change programme to stimulate adoption and continued utilization by householders.

2. Filtration. Household filters potentially present certain advantages over other technologies. They operate under a variety of conditions (temperature, pH, turbidity), introduce no chemicals into the water that may affect use due to objections about taste and odour, are easy to use, and improve the water aesthetically, thus potentially encouraging routine use without extensive intervention to promote behavioural change. At the same time, they have a higher up-front cost. Higher quality ceramic filters treated with bacteriostatic silver have been shown effective in the lab at reducing waterborne protozoa by more than 99.9% and bacteria by more than 99.9999%, and their potential usefulness as a public health intervention has been shown in development and emergency settings (Clasen 2004; 2006). The improving quality of locally-fabricated silver coated ceramics is particularly promising as a sustainable and low-cost alternative (Brown 2007). Slow-sand filters, which remove suspended solids and microbes by means of a slime layer (schmutzdecke) that develops
within the top few centimetres of sand, are capable of removing 99% or more of enteric pathogens if properly constructed, operated and maintained (Hijnen 2004). A simpler but more advanced version, known as the “bio-sand” filter, was specifically designed for intermittent use and is more suitable for household applications. It has been tested both in the laboratory and the field (Stauber 2006) and is being deployed widely in development settings by the Centre for Affordable Water and Sanitation Technology (www.cawst.org) and in the Philippines by Plan International.

3. Thermal and Solar Disinfection. Boiling or heat treatment of water with fuel is effective against the full range of microbial pathogens and can be employed regardless of the turbidity or dissolved constituents of water. The Philippines National Standards for Drinking Water (AO 2007-12) recommends bringing water to a rolling boil for 2 minutes, this is mainly intended as a visual indication that a high temperature has been achieved; even heating to pasteurization temperatures (60°C) for a few minutes will kill or deactivate most microbial pathogens. However, the cost and time used in procuring fuel, the potential aggravation of indoor air quality and associated respiratory infections, the increased risk of burns, and questions about the environmental sustainability of boiling have led to other alternatives. Solar disinfection, which combines thermal and UV radiation, has been repeatedly shown to be effective for eliminating microbial pathogens and reducing diarrhoeal morbidity (Hobbins 2004) including epidemic cholera (Conroy 2001). Among the most practical and economical is the “Sodis” system, developed and promoted by the Swiss Federal Institute for Environmental Science and Technology (http://www.sodis.ch) and promoted in the Philippines by Hevetas. It consists of placing lower turbidity (<30NTU) water in clear plastic bottles (normally 1.5-2.0L PET beverage bottles) after aerating it to increase oxygenation and exposing the bottles to the sun, usually by placing them on roofs. Exposure times vary from 6 to 48 hours depending on the intensity of sunlight. Like filters, thermal and solar disinfection do not provide residual protection against recontamination. Accordingly, householders must have a sufficient number of bottles to allow them to cool and maintain treated water in the bottles until it is actually consumed.

4. Combination Flocculation and Disinfection. A particular challenge for most household-based water treatment technologies is high turbidity (suspended solids). Such solids can use up free chlorine and other chemical disinfectants, cause premature clogging of filters, and block UV radiation essential in solar disinfection. While turbidity can often be managed by pre-treatment or even simple sedimentation, flocculation/coagulation using common substances such as alum can be an effective and relatively low-cost option. Such forms of assisted sedimentation have been shown to reduce the levels of certain microbial pathogens, especially protozoa which may otherwise present a challenge to chemical disinfectants. However, disinfection is still required in most cases for complete microbial protection. Certain manufacturers have combined flocculation and time-released disinfection in a single product that is sold in sachets for household use. Tests of one product have shown that it reduces waterborne cysts by more than 99.9%, viruses by more than 99.99% and bacteria by more than 99,999999% (Souter 2003). Unlike the other methods of household water treatment discussed above, it has also been shown effective in reducing arsenic, an important non-microbial contaminant in certain settings. Field studies have shown such flocculation-disinfection products to be effective in preventing diarrhoeal diseases (Reller 2003). While these products are relatively expensive on a per litre treated basis, they may have application in certain emergency and other settings with high or unpredictable turbidity.

C. Evidence on Health and Economic Impact

This section summarizes research on the health and economic implications of household water treatment. That research suggests that (i) household-based water treatment can deliver significant health gains over conventional source-based interventions, (ii) the up-front cost of providing low-cost household water treatment is about half that of conventional source-based interventions, (iii) most or all of that cost can be borne directly by the beneficiary, not the public sector, and (iv) the public sector will nevertheless recover more than the full cost of implementation from reduced health costs for disease treatment.
1. Effectiveness against diarrhoeal diseases. Because it prevents recontamination of water in the home, treating water at the household level is more effective than conventional improvements in water supplies in ensuring the microbiological quality of drinking water at the point of consumption (Sobsey 2002). This translates into improved health outcomes. In a systematic review of 15 intervention studies for the World Bank, Fewtrell and colleagues (2005) reported that household-based water treatment and safe storage was associated with a 35% reduction in diarrhoeal disease compared to a statistically insignificant 11% for conventional source-based interventions. A more recent and comprehensive Cochrane review covering 38 randomized, controlled trials and 53,000 people in 19 countries found that household-based interventions were about twice as effective in preventing diarrhoeal disease (47% reduction) as improved wells, boreholes and communal stand pipes (27%) (Clasen 2006a).

2. Cost. The cost of implementing water quality interventions varies, from a low of US$0.63 per person per year (solar disinfection) and US$0.66 (chlorination) to US$3.03 (ceramic filters) and US$4.95 (combined flocculation/disinfection). This compares to an average US$2.61 per person per year for installing and maintaining wells, boreholes and communal tap stands in Asia (Clasen 2007). The cost of treating water by boiling has not been rigorously investigated in the Philippines, but has been calculated in other settings in Asia using a variety of fuels. The estimated cost for boiling is US$7.99 to US$8.34 per household for wood and LP gas users per year, respectively, in India; it is US$3.24 to US$20.16 for wood collectors and wood purchasers, respectively, in Vietnam (McLaughlin 2006). In Indonesia, where kerosene is the most common fuel (like much of the Philippines), the cost of boiling was 11-20 times higher (depending on volume heated) than treating water with sodium hypochlorite (PSI 2006).

3. Cost-Effectiveness and Cost-Benefit Analyses. The combination of lower cost and higher effectiveness renders household-based chlorination the most cost-effective of water quality interventions to prevent diarrhoea, with a cost effectiveness ratio in Wpr-B of US$521 per disability-adjusted life year (DALY) averted, compared to US$1077 for conventional source-based interventions (Clasen 2007). When health cost savings are included in the analysis, implementing low-cost HWTS interventions such as home-based chlorination and solar disinfection actually results in net savings to the public sector; in other words, the intervention more than pays for itself. A recent WHO-sponsored analysis also concluded that household-based chlorination was among the most cost-beneficial of the various options for pursuing the MDG water and sanitation targets, yielding high returns on every dollar invested mainly from lower health care costs but also increased productivity and the value of school attendance (Hutton 2007).

4. Willingness to Pay. Finally, there is considerable evidence that the target population is willing and able to pay for some or all of the cost of household-based water treatment products, leveraging public sector and donor funding and allowing it to be more focused on the base of the economic pyramid (Ashraf 2006). Population Services International (PSI), an NGO, has socially marketed more than 9 million bottles of sodium hypochlorite in 19 countries at an average price that equals or exceeds the cost of production (POUZN Project 2007); it also sells flocculant-disinfectant sachets in 8 countries at prices ranging from US$0.05 to 0.10 per sachet (treating 10L). A commercial company has sold more than 20 million NaDCC tablets in Kenya in the last 12 months on a for-profit basis. In the Philippines, commercial sales of 1.25% sodium hypochlorite are increasing both in urban centres at the recommended Php 30 sales price but also in more remote areas where the price more than doubles. The popularity of water supplied from refilling stations at significantly higher costs (Php 1-5/20L) provides further evidence of willingness and ability of consumers to pay for household water treatment products.

D. Epidemics and Emergencies

Outbreaks of infectious diseases and other emergencies occasioned by flooding and drought impose a heavy health burden in the Philippines and divert scarce health and economic resources away from continued national and regional development strategies. Because of its potential for rapid
and targeted deployment, household-based water treatment can be an effective intervention in response to such epidemics and emergencies. Point-of-use chlorination, solar disinfection and sachets combining flocculation/disinfection have been shown effective in reducing transmission of cholera and other diarrhoeal disease in outbreaks and emergencies (Conroy 2001; Doocy 2006). As noted above, a two-year pilot using sodium hypochlorite in Pangasinan following the SWS approach was effective and acceptable (University of Manila 2006). There is also evidence that such epidemics and emergencies provide an opportunity for increased adoption and long-term use by the target population (Ram 2007; Clasen 2006).

While boiling is often promoted in the Philippines and elsewhere in response to outbreaks of suspected water borne diseases and other emergencies involving interruption of water supplies, there is evidence that it may not be completely protective in actual practice. In random sampling of 400 households in Indonesia following the 2005 tsunami where people were encourage to boil, 47.5% of samples from the households were positive for *E. coli*, with 13.3% >101 CFU/100ml (high risk) and 18.0% <10>100 CFU/100ml (intermediate risk) (Handzel 2005). Another study of water samples from 1027 households in post-tsunami Indonesia found that neither adequate boiling (maintaining a rolling boil for at least one minute) nor adequate boiling combined with water storage in a narrow mouthed container were associated with a decreased risk of stored water contamination (Gupta 2005). This contrasts with results in Vietnam where, in a 12-week longitudinal study not involving an emergency or displaced population, boiling was associated with a 97% reduction in faecal contamination of stored drinking water in the home compared to source water (Clasen 2008).

E. Scaling Up HWTS in the Philippines

Governmental authorities, WHO and UNICEF, certain NGOs, research institutions and the private sector have established the foundations for an effective programme to promote household water treatment and safe storage in the Philippines. They are committed to expanding the coverage and uptake of HWTS in the country, particularly among the most vulnerable. They recognize certain challenges that must be overcome in order to achieve widespread and sustained adoption of the intervention. At the same time, they have identified opportunities for advancing HWTS in the Philippines, and strategies that they may pursue in order to scale up the intervention. Among other things, they agree on the need to coordinate their efforts.

In furtherance of such coordination, a National Stakeholders Forum on Household Water Management Promoting Household Water Treatment and Safe Storage was held in Manila on 15-16 November 2007. Attendees included more than 80 delegates from national and provincial governmental agencies, UN agencies, NGOs and CBOs, technical advisors, academic and research institutions, and commercial companies that manufacture and sell HWTS products. They heard presentations on and discussed the state of water and waterborne disease in the Philippines, research on the effectiveness and cost-effectiveness of HWTS, case studies involving the implementation of various approaches in the country, and recent successes and challenges in implementing HWTS in other countries.

During the Forum and the preparations for it, stakeholders identified possible action items for scaling up HWTS in the Philippines. These are listed in the Appendix A. They also agreed to organize a National Network for the Promotion of Household Water Treatment and Safe Storage (National Network) and established the mission, goals and guiding principles of such Network. The National Network would be organized around the following themes: Advocacy and Communication, Planning and Implementation, Communication and Knowledge Sharing, Research and Governance. It was also agreed that leadership of the Network would be provided by a Steering Committee consisting of representatives from of the stakeholders and chaired initially by the Director IV, National Center for Disease Prevention and Control, Department of Public Health. Numerous workshop participants agreed to serve on the Steering Committee.
Workshop participants then reviewed the list of possible action items in order to determine which items deserved particular priority and should therefore be part of the initial national plan for the National Network. After deliberations, they nominated several action items following the themes along which the National Network. These appear in Annex B hereto. Thereafter, workshop participants were each given the opportunity to vote on the single action item that they believed to be the highest priority. The total votes received for each item appears in brackets after each item in Annex B. The Steering Committee then convened to agree on the date of their initial meeting.

References


Souter PF, Cruickshank GD, Tankerville MZ, Keswick BH, Ellis BD, Langworthy DE, Metz KA, Appleby MR, Hamilton N, Jones AL, Perry JD. Evaluation of a new water treatment for point-of-use household applications to remove microorganisms and arsenic from drinking water. *J Water Health* 1(2):73-84


Appendix A

POSSIBLE ACTION ITEMS

1. Governmental Policy, Regulation and Planning

a. Policy
   - Ensure that national policies and strategies of the Department of Health recognize HWTS as an effective and cost-effective means of delivering the health gains associated with safe water in furtherance of national priorities and the MDGs
   - Develop and integrated HWTS strategy consistent with the Fourmula One approach
   - Emphasize the economic and poverty reduction benefits of HWTS, and secure promotional/training funding as part of the larger water supply/water resource policy and budget
   - Encourage greater funding of HWTS programmes at the national and especially the provincial level with initial targeting designed to address particular problems but also achieve demonstrable success to mobilize others
   - Balance the priority often given to emergency/outbreak response with more sustained support of HWTS on a routine basis
   - Define role of HWTS in emergency response, include training in HWTS approaches as part of the emergency response, and promote the transition of emergency to routine use
   - Based on the defined role for HWTS in emergencies, forecast and stockpile supplies of effective point-of-use products in order to improve preparedness and prevention
   - Explore HWTS as a solution for the high proportion of “improved water supplies” that 1995 field study found to be microbiologically unsafe
   - Clarify the role of boiling in HWTS, both in emergency and development (routine) practice
   - Encourage inclusion of research and practices into school curriculum as part of the wider water, sanitation and hygiene programme

b. Regulatory Matters
   - Encourage Department of Health to issue an Administrative Order that builds on AO 2007-005 by recognizing other rigorously researched HWTS options (e.g., NaDCC tablets, solar disinfection, biosand filters, combined flocculant/disinfectant) as safe and effective alternatives to sodium hypochlorite
   - Develop guidelines for national level standards for HWTS products
   - Review extensive body of research on the safety of PET bottles for solar disinfection of water and issue an official letter confirming same
   - Expedite registration of proven HWTS products
   - Reduce duties, taxes and other costs on imported HWTS products in order to improve affordability
   - Establish and fund water testing and surveillance programme to validate the microbiological performance and health impact of HWTS over 2-3 years in an especially challenging province

c. Leadership, Advocacy and Administration
   - Establish and equip DoH team to provide effective technical assistance to provinces and barangays to optimize HWTS choices, performance and coverage
   - Contract with NGOs, CBOs and the private sector to deliver targeted HWTS interventions
   - Train and involve Sanitary Inspectors, Barangay Health Workers (BHW) and other change agents (teachers, agricultural extension workers, students, etc.) in the promotion of effective HWTS
   - Coordinate the development of IEC materials that all stakeholders can use to promote HWTS at all levels
   - Disseminate AO 2007-005 more broadly to increase awareness of policy
• Once adequate supplies are available, consider the launch of generic (non-branded) national media campaign to increase awareness and demand for HWTS products, followed by community-based promotion by NGOs/CBOs at the local level
• Facilitate coordination of national policies that affect HWTS implementation at the provincial, municipal, barangay and sitio level and through greater inter-sectoral and inter-departmental cooperation
• Coordinate HWTS activities with other water, hygiene and sanitation strategies and initiatives, and encourage pursuit of synergistic opportunities with other interventions (mother and childhood health, immunizations, malaria and filariasis control, etc.)
• Consider entering into (or having donor enter into) guaranteed contracts with suppliers (similar to drugs for neglected diseases) to stimulate investment for higher levels of production and distribution of cost-effective options
• Encourage multi-lateral, bilateral and other donors to fund effective and cost-effective HWTS activities in support of the MDG targets for water coverage, health and child survival

2. Increase understanding and awareness of, and demand for, HWTS
• Identify the awareness gaps (e.g., that diarrhoea is natural/inevitable, that improving and protecting water quality minimized disease) and make those first priority; this will require multi-focused strategy depending on the target audience
• Adopt a consumer-oriented strategy; use consumer research to find out what the target population wants, and try to meet their demands
• Once adequate supplies are available, consider the launch of generic (non-branded) national media campaign to increase awareness and demand for HWTS products, followed by community-based promotion by NGOs/CBOs at the local level
• Consider a “national HWTS day” to coordinate governmental and non-governmental promotional campaigns
• Encourage targeted promotion of HWTS during rainy season when populations feel most vulnerable to waterborne diseases and are thus more willing to adopt protective measures
• Develop and disseminate effective, language- and culturally-appropriate IEC materials
• Develop specialized IEC materials for schools, clinics, emergencies
• Develop creative and appropriate strategies to reach remote locations
• Emphasize community- and household-based communication and demonstrations in addition to mass media Use locally-produced video to promote HWTS in mobile “road shows”, schools, community gatherings
• Using donor support, develop and implement campaign to give away initial supply of HWTS products as an introductory measure
• Use low-cost water analysis techniques (pool testers, aquarium testers, Coliscan™ prepared culture plates) to test water chemicals and microbiol
• Publicise success stories
• Create more visibility for HWTS at schools, clinics, health posts, etc.
• Use rapid sanitary surveys and drinking water quality indices to create awareness of water resource conditions and encourage householders to use the best available water sources

3. Coordination among HWTS Implementers
• Establish partnerships with DoH, provincial and municipal governments optimize coverage and allocation of resources
• Develop coordinated advocacy strategy to develop support and funding to make HWTS a priority at provincial level by demonstrating not only health but also economic benefits (net savings) from investing in HWTS
• Conduct technology and stakeholder forums at provincial and municipal levels
• Continue to map existing HWTS implementation efforts to improve awareness and monitoring of progress
• Introduce HWTS in emergencies and outbreak response as a long-term solution
• Provide training to in HWTS technology to provincial sanitary inspectors and BHWs
• Promote choice of different technologies and delivery strategies (public, social marketing, NGO, commercial)
• Coordinate implementation with existing Total Sanitation programmes
• Provide training in various HWTS products and technologies to promote optimal solutions and sustained uptake through greater acceptability
• Encourage collaboration with International HWTS Network, WPRO and other international HWTS efforts
• Increase access to research and lessons learned
• Emphasize overall programme management in delivery of HWTS interventions

4. Improve access to HTWS by vulnerable populations
• Increase availability/access to commercial HWTS products by taking advantage of and improving supply chains, especially to remote rural and costal populations
• Use schools, clinics, emergency-response and other special settings to promote and deliver HWTS options
• Include HWTS options as part of preparedness for natural disasters, and take advantage of special funding reserved for emergency response
• Look for opportunities to achieve multiple goals (e.g., Safe Water and AIDS project, school-based initiatives, child survival, survival kits)
• Employ micro-enterprise and micro-finance to enhance delivery and access
• Take advantage of entrepreneurial opportunities for fabricating, distributing and selling HWTS products
• Promote local production of effective HWTS options (e.g., ceramic filters) and improve capacity of existing producers
• Improve project/process management capacity for producing, delivering and securing use (behaviour change) of HWTS products as part of the effort to ensure quality control and optimize results

5. Promote research, monitoring and evaluation
• Involve Philippine governmental laboratories and epidemiologists, WPRO, universities, reference libraries and other research institutions in HWTS research and M&E
• Document and publicise the economic advantages of HWTS over refilling stations, boiling and other alternatives in the Philippines
• Evaluate the effectiveness of HWTS options to contain cholera and other outbreaks of waterborne disease
• Document and publicise the out-of-pocket savings to the public sector and householders from using HWTS (less diagnostic and treatment costs, medicines, lost productivity, etc. in the Philippines
• Document other benefits associated with HWTS (reduced school absenteeism, increased productivity, possible reduction in co-morbidity with other infections/diseases)
• Emphasize strategies for achieving acceptability, correct/consistent use, sustained use
• Study why people adopt household water treatment (aspirational, family, beauty, “good mother”, etc.) and other issues of behaviour change in the context of HWTS
• Implement longitudinal studies to verify efficacy trials
• Evaluate extent to which introduction of HWTS in emergency, outbreak or higher risk (e.g., rainy season) context increases adoption and long-term use of HWTS in the Philippines
• Develop and implement systems to monitor longer-term adoption
Appendix B

ESTABLISHING PRIORITIES IN 2008-2009

A. Advocacy
- Facilitate development of guidelines on HWTS (for DoH to issue administrative orders) (11)
- Disseminate AO 2007-005 and AO 2005-003 (Guidelines on the issuance of CPR for water purification devices and equipment) (14)
- Ensure HWTS is a government priority and adopts policies and strategies for HWTS (1)
- Encourage members of HWTS to register their technologies (4)
- Tap TV for promotion of HWTS (1)
- Encourage inclusion of research and practice into school curriculum as part of the wider water, sanitation and hygiene programme (0)
- Support the DoH in the development of guidelines on the use and reuse of PET bottles as drinking water containers (3)
- Link HWTS with International Year of Sanitation 2008 for funding (1)
- Develop

B. Planning and Implementation
- Develop and issue an AO to promote the use of HWTS (2)
- Integrate HWTS in Livelihood Programs (4)
- Explore different financing schemes for HWTS (3)
- Develop low-cost, appropriate and culturally-appropriate technology options (9)
- Develop an integrated HWTS strategy consistent with the Formula approach (0)
- Ensure that national policies and strategies of the Department of Health recognize HWTS as an effective and cost-effective means of delivering the health gains associated with safe water in furtherance of national priorities and the MDGs (0)
- Facilitate greater funding of HWTS programmes at the national and especially the provincial level with initial targeting designed to address particular problems but also achieve demonstrable success to mobilize others (5)

C. Knowledge sharing and communication
- Establish and equip Network members to provide effective technical assistance to provinces and barangays to optimize HWTS choices and performance (4)
- Provide training on products and technologies to promote optimal solutions and sustained uptake through greater acceptability (0)
- Train and involve sanitary inspectors, VBHWs and other change agents in the promotion of effective HWTS (4)
- Document and publicise the economic advantages of HWTS over refilling stations, boiling and other alternatives in the Philippines (0)
- Create more visibility for HWTS at schools, clinics, health posts, etc. (3)
- Use of HWTS in emergencies and outbreaks response as a long-term solution (4)
- Publication and dissemination of proven HWTS technologies (3)

D. Research
- Develop a working agreement with DoH to do research on HWTS technologies (4)
- Identify acceptable parameters for research—DoH/Govt standards (1)
- Map areas of greatest need for HWTS (15)
- Continue mapping of implementers and HWTS technologies being promoted (5)
- Develop common indicator for monitoring systems for implementers of HWTS (4)

1 Number in brackets is the number of votes received when workshop participants were asked to determine their top priority.
E. Governance

- Work to achieve a strong and active network (0)
- Organization of functional of HWTS Network (4)
- Provide updates (0)
- Form technical working groups with full time, dedicated staff for programming (0)
- Establish links among HWTS stakeholders (2)
- Form support mechanisms (2)