USAID
FROM THE AMERICAN PEOPLE

# Water Supply, Sanitation and Hygiene (WASH) Course

## Participant Workbook

March 4-8, 2013
Training Resources Group, Washington D.C.

**Presented by USAID's Bureaus** for Economic Growth, Education and Environment and Global Health

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# INTRODUCTION

Welcome to the Water, Sanitation and Hygiene (WASH) course. This course is part of a competency-linked learning initiative for USAID. The general objective of this course is to provide USAID field staff with an introduction to the technical field of WASH and an understanding of the tools available to support effective programming in this high priority development sector.

## Course Objectives

By the end of this course, you will:

Describe why the WASH sector is important for USAID.

Discuss and apply institutional and legal requirements to USAID programming in the WASH sector.

Examine proven interventions in Water, Sanitation, and Hygiene that are available to accomplish WASH objectives.

Plan how to apply USAID resources and programming mechanisms to address challenges and comply with regulations in the WASH sector – leading to effective and responsive WASH programming.

## Agenda

| Online Pre-Course | Day 1: Monday - Theme: WASH Sector – Context / Institutional & Legal Frameworks and Water | Day 2: Tuesday - Theme: Proven Interventions & Best Practices in Sanitation & Hygiene/ M&E and Reg 216 | Day 3: Wednesday - Theme: Site Visit | Day 4: Thursday - Theme: After Action Review, Financing and Integrated Approaches | Day 5: Friday - Theme: Programming Integrated Activities Exercise & Resources and Wrap-up |
|---|---|---|---|---|---|
| Breakfast / travel to training site | | | | | |
| Definitions<br><br>WASH Facts & Figures<br><br>Current WASH Issue Readings | 8:30 – 12:30<br>Registration<br><br>Opening / Overview / Expectations / Some Starting Definitions<br><br>Break<br><br>Turbulent Waters of WASH: Emerging Issues in the Field<br><br>Institutional / Legal Frameworks Impacting WASH part 1 | 8:30 – 12:30<br>Opening / Overview of Day<br><br>Proven Sanitation Interventions (Part 1)<br>• Sanitation Sustainability Principles - Technology, Governance, Finance, & Environmental Best Practices for Urban & Rural Areas<br><br>Stretch break<br><br>Proven Sanitation Interventions (Part 2)<br>• Best Practices<br><br>Break<br><br>Proven Hygiene Interventions (Part 1)<br>▪ Key hygiene practices for diarrheal disease reduction<br>▪ Steps in designing a hygiene behavior change strategy. | 8:30 to 12:30<br>Site Visit:<br><br>Meet the hosts / briefing<br><br>Site visit to build on Day 2 sessions / include examples of WASH best practices in<br>▪ Technology<br>▪ Governance<br>▪ Finance<br>▪ Environment<br>▪ Behavioral Change | 8:30 to 12:30<br>Opening / Overview of Day<br><br>After Action Review<br>▪ Lessons Learned from site visit<br><br>Break<br><br>Group Reports<br>▪ Lessons Learned<br>▪ Trainer Summaries<br><br>WASH Financing | 8:30 to 1:00<br>Opening / Overview of Day<br><br>Programming Integrated WASH Activities: Applying Your Knowledge<br>• Group Task<br>• Discussion<br>• Application<br><br>WASH Programming Resources<br><br>Course Wrap-Up<br>• Application Planning & Commitments<br>• Course Evaluation<br>• Certificates<br>• Closing |
| LUNCH (1 hour) | | | | | Closing Lunch |
| | 1:30 to 5:00<br><br>Institutional / Legal Frameworks Impacting WASH Part 2<br><br>Break<br><br>Proven Water Interventions (Part 1)<br>▪ Key Characteristics of Water Supply and Best Practices<br><br>Break<br><br>Water Interventions (Part 2)<br>▪ Technology, Governance, Finance, & Environmental Best Practices for Urban & Rural Areas | 1:30 to 5:30<br><br>Proven Hygiene Interventions (Part 2)<br>▪ Best Practices for promoting behavior change<br><br>Break<br><br>Monitoring & Evaluation for WASH<br><br>Regulation 216<br><br>Prep for site visit | 1:30 to 5:00<br>Site Visit<br>▪ continued<br><br>Wrap-up / thank hosts<br><br>Return to training site | 1:30 to 5:00<br><br>Integrated WASH Programming Approaches<br><br>Break<br><br>Review Exercise: Game Show | |
| | Journaling & Discussion / Overview of Next Day | | | | |

## Trainer Biographies

**Sharon Murray** has worked for 25 years in a variety of environmental management and interdisciplinary development positions in both the US and abroad. She has been a core member of the USAID Water Team/Office since 1999, and has provided technical support to over 25 Missions in strategic planning, activity design and program evaluation related to water resources management and water supply and sanitation service delivery in a variety of settings in all regions. She also designed, manages and provides ongoing technical support to several multi-million dollar GDA partnerships, including the Coca-Cola "Water and Development Alliance" (WADA) GDA partnership (with current water sector activities in 23 countries). With Global Health Bureau she co-manages a GDA water partnership with Rotary International, with WASH activities in Dominican Republic, Philippines, and Ghana. Besides GDAs, she is also AOTR for the "GLOWS" Leader With Associates (LWA) mechanism in integrated water resources management and WASH service delivery. She also provides field support to Missions through water sector knowledge management activities of the Water Office, as well as training in Environment/Natural Resources Management, Water Supply, Sanitation and Hygiene (WASH), Water and Climate Change, and Water and Food Security. In addition to field support, Sharon is engaged in USG interagency efforts and international leadership activities related to water, including Water Team participation in international water events and technical input into other major USG policy initiatives in the water sector. Sharon holds a Masters Degree in City and Regional Planning and a Ph.D. in Environmental Science, Policy and Management.

**Helen Petach** is currently a Biomedical Research Advisor for USAID Bureau for Global Health, with primary responsibility for managing indoor air pollution, water, sanitation, and hygiene activities with a particular focus on health impacts. She has over 20 years experience in biomedical research and education. Prior to joining USAID, she was a member of the faculty at the University of Waikato and later at the University of Colorado. She has worked in the private sector to create business strategies and manage product development for telecom products at Hewlett-Packard and disease diagnostics at SomaLogic. She holds a Ph.D. in Chemistry from Cornell University.

**Rochelle Rainey** serves as USAID's Senior Advisor for household drinking water quality and provides leadership in the development, evaluation, and dissemination of innovative program approaches in health-focused water supply, sanitation and hygiene activities. She serves as liaison to and coordinates with the USAID Water Team, linking health-focused water supply and sanitation activities with other water sector activities, including integrated water resources management and Feed the Future. She also maintains liaison with other international development organizations such as WHO, PAHO, UNICEF, UNDP, and the World Bank and other donor and bilateral agencies in the areas of water, sanitation and hygiene behavior change. Rochelle has a BA in Business Administration, an M.Sc, in Environmental Health Management, and a Ph.D. in Public Health from Oregon State University. Dr. Rainey served as a Peace Corps volunteer in Nepal (1988-1990), and then returned to Nepal as a Fulbright Scholar (2001 – 2002) where she conducted research to pilot-test solar disinfection of drinking water in households in peri-urban Kathmandu. She has had extensive experience in a variety of

development activities, including microfinance, gender analysis, natural resources management, sustainable agricultural production, and public health.

**Jesse Shapiro** is a Water, Sanitation and Hygiene (WASH) Advisor and Sanitation Focal Point at USAID. He is an engineer with experience in WASH policy development, organizational capacity building, and provision of technical assistance to government for the WASH sector. Jesse has particular expertise in sanitation including CLTS, sanitation marketing and building enabling environments for sanitation improvement. Prior to joining USAID, Jesse was based in the field with the governments of East Timor and the Marshall Islands, was a technical advisor for various INGOs, and was a Peace Corps Volunteer. Jesse holds a Master's of Science in Civil Engineering - Water and Sanitation from Michigan Technological University, a Graduate Certificate in Sustainability from Michigan Technological University and a Bachelor of Science degree from the University of New Mexico.

**Heather Skilling** is a Senior Water and Sanitation Advisor within the Water Office of E3. She has more than 25 years of experience in the water and sanitation sector working with USAID, The World Bank, Asian Development Bank, GIZ, DfID and private consulting firms. Within the Water Office she is COR for the SUWASA Project (Sustainable Water and Sanitation in Africa), Activity Manager for the Africa component of FABRI (Further Advancing the Blue Revolution) and AOR for our grants to the Africa Water Operator's Partnership of Africa Water Association and to the Water and Sanitation Program of the World Bank. She is a member of the Steering Committee of Sanitation and Water for All on behalf of USAID and provides technical assistance and strategic support to Bureaus and Missions in the area of water and sanitation, especially urban services. Ms. Skilling specializes in working with service providers (both utilities and small scale providers) to improve service, particularly to poor customers, through better governance and management and through partnerships and contracting. She also has worked with governments to improve the institutional, regulatory and legal operating environment for service providers. Heather has worked on service improvement and sector reform in countries including the Bahamas, Brazil, China, Ghana, Guyana, Hungary, India, Indonesia, Lesotho, Malawi, Montenegro, Pakistan, the Philippines, Saint Lucia, Serbia, Thailand and Uganda. Until April 2005, Ms. Skilling was Vice President and Practice Director of Stone & Webster Consultants' Regulation and Privatization Practice. Prior to that, she was Senior Manager with Deloitte & Touche's Emerging Market Group in the utility practice. Heather has a Bachelor's Degree from Williams College and a Masters Degree in International Economics from Johns Hopkins University School of Advanced International Studies. She also studied at the American University in Cairo.

**Merri Weinger** has over 30 years experience in public health and development, with a special focus on environmental and occupational health. She currently manages hygiene improvement in the Maternal Child Health Division of USAID's Bureau for Global Health, with a special focus on providing technical assistance to Missions in the design, implementation and evaluation of innovative water, sanitation and hygiene (WASH) programming. She is also actively engaged with other international development organizations, donors, academic institutions and non-governmental organizations in collaborative WASH-related initiatives and partnerships. Prior to joining USAID, she worked with the World Health Organization in Geneva for 10 years in the

Offices of Environmental Health, Health Promotion and Communicable Diseases (Roll Back Malaria Initiative). In the international arena, she has also provided consultation to the Pan American Health Organization, International Labour Organization, non-governmental organizations, academic institutions and community organizations with emphasis on health promotion, human resources development and training. In addition to her international experience, she worked for over 10 years with the City and State Health Departments in northern California in environmental and occupational health promotion. Merri holds a Bachelor's Degree from Barnard College in Latin American Studies and anthropology and a Master's in Public Health from the University of California at Berkeley.

**Meredith Ferris** has worked for 10 years with Training Resources Group, Inc. (TRG) as an adult learning specialist and organizational development consultant. Over those 10 years she has worked extensively with a variety of USAID Bureaus, Offices and Teams. In her work with USAID she has served as a consultant working in partnership with USAID staff to design, develop and lead successful implementation of conferences, workshops, and training programs both in the US and overseas. As part of the Capitalizing Knowledge, Connecting Communities (CK2C) contract she has helped to design, deliver, monitor and adapt blended and online training courses include the Environment Matters, ENRM Overview, WASH Overview Course, Applied ENRM Programming, ENRM Foundations (online), Programming Environment Funds (online). In addition to her work with USAID, she has worked with numerous domestic and international clients including the World Bank, the International Finance Corporation, the International Monetary Fund, the Environmental Protection Agency, Biogen Idec, and many others. Ms. Ferris is skilled in the development of highly effective participant materials and in the design and delivery of blended experiential training programs. She holds a Bachelor's degree in music with a minor in psychology from Mary Washington College and a Masters Degree in Adult Education and Human Development from The George Washington University.

**Sarah Schmidt** is the Assistant Program Manager for USAID's CK2C project. She manages bilingual web content, communications, and partner outreach for www.frameweb.org, a collaboration and knowledge-sharing tool for approximately 2,000 NRM practitioners around the world. Her role with CK2C draws on her previous experience as DAI's Knowledge Management Specialist, where her work supported DAI's thought leadership and new business initiatives. Sarah's eleven years of professional activity in Latin America, the Middle East, and Washington, D.C., have given her solid experience working in multiple sectors of development with national governments, nongovernmental organizations, and communities, including in conflict areas. Before coming to DAI, she worked for the International Monetary Fund performing research and analysis and for Peace Corps Panama as both a volunteer and a staff member. Sarah holds an M.A. in international relations from the University of St. Andrews, Scotland, with a concentration in Middle East conflict. In addition to her native English, she is fluent in Spanish.

Day 1

# Online Prerequisite Course - WASH Definitions and Facts & Figures

## Speed Connecting: Challenges and Opportunities

### Individual Task

Think of the challenge or opportunity you posted online and be prepared to describe it in 2-3 sentences.

### Group Task

As you share these with others, note any similar challenges/opportunities you and others are facing.

## TURBULENT WATERS OF WASH: CURRENT DEBATES IN THE FIELD

**Key Messages:**

- There are key emerging topics and debates in the WASH sector that USAID staff should be conversant about as they do WASH programming.
- For USAID to be a more transformative actor in WASH worldwide, Agency staff must understand the latest evidence and paradigm shifts in the sector and incorporate these concepts in USAID programming.

## Five Key Debates

- "Hydro-Philanthropy"
- Water and Sanitation as a Human Right
- Sanitation: The "Big Necessity"
- The Sustainable Services at Scale Approach ("Triple-S")
- Life Cycle Costing of WASH Services ("WASHCost")

### Table Task

With your table, talk about your answers to the discussion questions posted for the topic you've been given. Make a few notes as needed.

## INSTITUTIONAL AND LEGAL FRAMEWORKS IMPACTING WASH: PART I

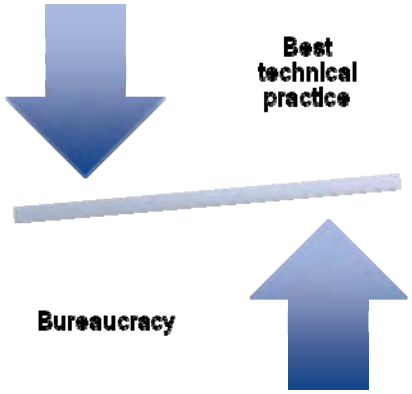
**Key Messages:**

- There are numerous, distinct USG policy, legislative, and budgetary guidelines and requirements related to WASH that must be understood and respected in USAID programming.
- Each has a different scope, various definitions, and different timing for when and how to apply them.
- This session will introduce these requirements and give participants a chance to 'practice' their application.
- Additional resources will be introduced that are available after the course to assist in working with these various requirements appropriately.

## Water Programming at USAID

In addition to the enormity and complexity of the WASH challenge facing the world, there is the added layer of USAID's own institutional and legal complexity.

At the international level, there have been several major commitments and widespread endorsements related to WASH since 2000 – including the Millennium Development Goals for water and sanitation, the Water for Life Decade in the 90's, and the International Year of Sanitation in 2008.




**Graphic 1 – Balancing technical best practice with bureaucratic constraints**

Within the US, there has been an increasing amount of attention paid to WASH in developing countries on the part of citizen interest groups. This has led directly to increased Congressional interest in international WASH from both political parties as well as the House and the Senate, making it an extremely resilient to changes in administrations or Congressional elections.

On the part of the US Congress, there has been a particular focus on WASH in sub-Saharan Africa and the need for USAID to shift funding to these countries.

How has all this interest expressed itself in the legal and institutional context of USAID over the last several years? It may be helpful to view them as 'levels' of policy and law that include WASH, but have different levels of legal and financial authority associated with them. Figure 1 and **Table 1** outline these various levels.

**Figure 1 - The USAID Institutional Context for "Water"**

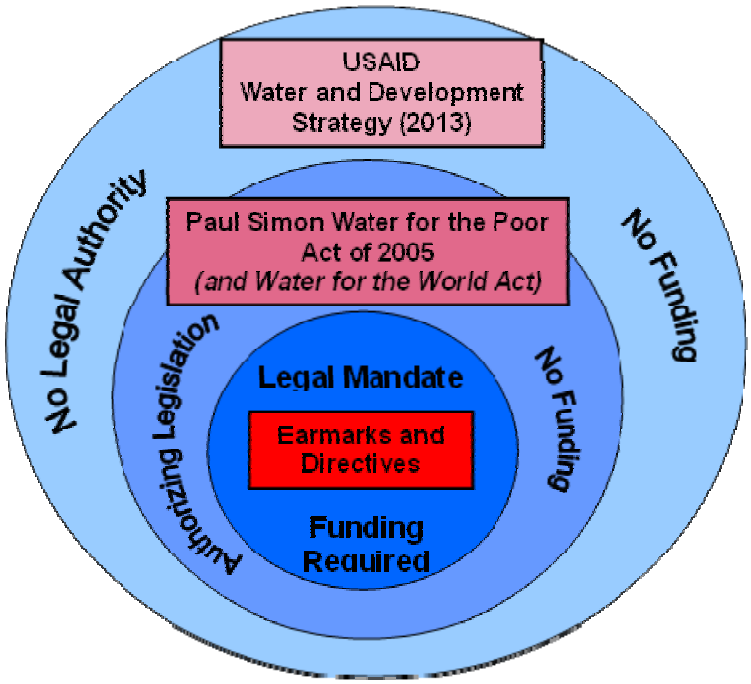


**Table 1 – Legal/ policy levels related to WASH with funding and reporting requirements**

| Name | What is it? | Legal Authority | Time Period | Funding | Reporting Requirements |
|---|---|---|---|---|---|
| Agency "Water and Development Strategy" | Provides a strategic framework for the water sector which emphasizes two major areas of focus - (1) WASH, (2) water and food security (especially agricultural water use). Emphasizes integrated water resources management, climate change resiliency, etc. It also recommends greater geographic focus. | Internal Agency policy document | To be finalized in 2013 | No specific funding provided | TBD, but will draw on existing reporting structures outlined below. |
| Paul Simon Water for the Poor Act | Authorizing legislation that requires USAID/DOS to develop and implement a 10 year strategy to address water supply and sanitation access and water management that supports increased access to WASH | Authorizing legislation | 2000-2015 | No specific funding provided | USAID funding for all water- related activities has been reported since 2000 |
| Earmarks or Directives | "Hard" Congressional appropriation – water earmark definition focused on WASH (both specific WASH interventions, and some water resources management or water productivity with clear and demonstrable linkages to WASH). Other key initiatives including FtF and GCC also potentially partially attributable for WASH activities. | Appropriations legislation | Annual since 2003 | $315 million hard earmark ($125 million in Africa) (as of FY2012) | Required reporting on funding levels for all earmark eligible activities (E3 Water Office compiles with assistance of FACTS, BRM, Regional/Pillar Bureaus and Missions) |
| Foreign Assistance Framework / Operational Plans/ PPRs | The Agency's annual programming, budgeting, target setting, and reporting platform. Includes requirement to allocate funding according to Water "Sub-Key Issues" | Administrative requirement | Annual | N/A | Funding is broken out across four sub key Issue areas including WASH. Funding for all water-related activities has been reported since 2000. |
| FACTS Indicators | USAID database for reporting progress against annual Operational Plans and PPRs – includes Standard Indicators associated with FAF Elements (which are recommended but not required), and limited opportunity to develop Custom Indicators. | Administrative requirement | Annual | N/A | Standard Indicators for WASH located under Elements 3.1.8 and 3.1.6.8 WASH activities can be programmed under numerous other Elements/Sub-Elements and still use these WASH standard indicators. |

## USAID Water Earmark

### Background and context

Earmarks are funds provided by the Congress for projects or programs where the congressional direction (in bill or report language) circumvents the merit-based or competitive allocation process, or specifies the location or recipient, or otherwise curtails the ability of the Executive Branch to strategically manage funds. Congress includes earmarks in appropriation bills - the annual spending bills that Congress enacts to allocate discretionary spending - and also in authorization bills, although the latter do not guarantee that funding will actually be appropriated.[1]

Though the Agency does sometimes get earmarks directing funding to specific geographies or recipients, most of the earmarks that USAID deals with are line item type earmarks for technical sectors, like water, biodiversity, HIV/AIDS, microenterprise, climate change, etc.

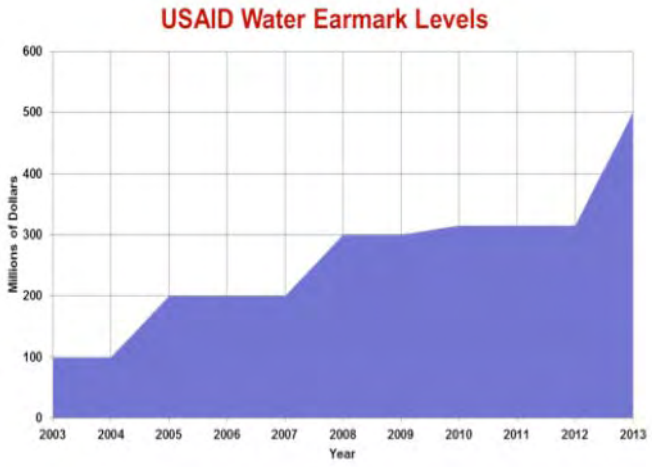
There are a few things to be aware of as you are considering how you apply earmarks and directives in your programming for WASH and any other sector.

- **An earmark is legislation and therefore a law and legally binding:** The Agency is legally bound to meeting the levels and terms of the earmark.
- **Legislation is renewed annually:** USAID annual appropriations bill may include changes in funding levels or Congressional definitions from year to year.
- **There are different types of earmarks**: Hard earmarks are required to be met, soft earmarks and directives are usually considered to be recommended but not required, and other Initiatives or directives may be required by the Executive Branch. The 'water earmark' has been a hard Congressional earmark since 2003, with the exception of FY11, where the federal government was on a Continuing Resolution for the entire fiscal year.
- **Earmarks are reportable and auditable:** The Agency is subject to audits on how closely we have conformed to earmark requirements.

### Earmark levels (2003-2012)

- "Water supply and related activities" earmark was first imposed in FY2003– at a level of $100 million
- Increased to $200 million in FY2005, with $50 million targeted to sub-Saharan Africa
- Increased to $300 million in FY2008 and FY2009, with $125 million targeted to sub-Saharan Africa

**Figure 2 - USAID Water Earmark levels**



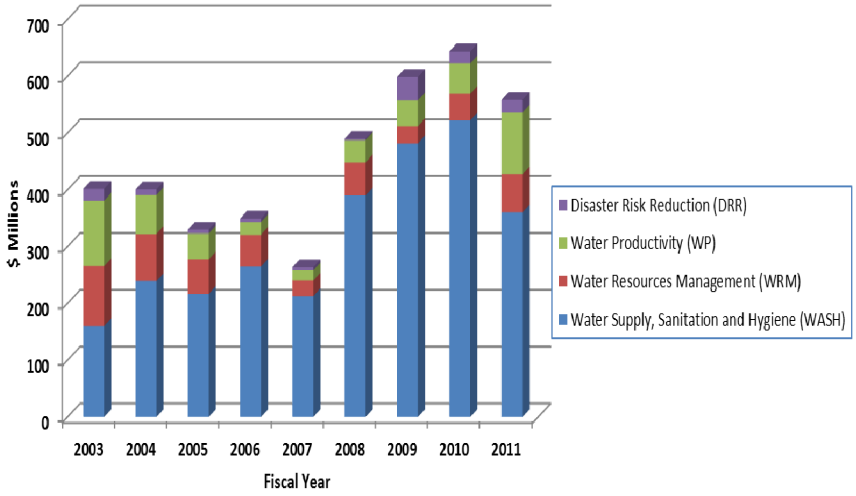

[1] Source: http://earmarks.omb.gov/

- Increased to $315 million for FY2010-12, with $125 million targeted to sub-Saharan Africa

**Trends**

It's useful to look at the funding trends across all different subsectors of water activities over time, and specifically how the water earmark has affected that. Figure 3 compares these subsectors and is described in detail below.

**Figure 3 - Comparison of water subsector over time**




*WASH*

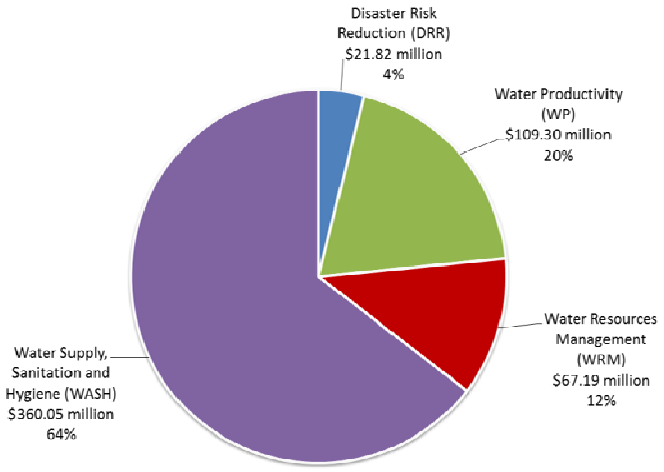
- From 2003-2007, the water earmark only drove slight shifts in water sector programming, WASH funding did experience a slight increase overall.
- Starting in 2008, there was a dramatic uptick in WASH-focused spending, not only in sub-Saharan Africa, but also in some of the CPC countries around the world.

*Water Resources Management and Water Productivity*

- In 2003, the distribution of water-related funding was fairly even across the three subsectors of WASH, Water Resources Management (WRM), and Water for Productive Uses (WP), including agriculture, industry, and energy.
- Starting in 2004, the non-WASH proportion of activities decreased relative to WASH. This is due to a combination of the increase in the WASH-focused water earmark, a simultaneous increase in other 'environment' sector earmarks (e.g. biodiversity), and the great decline in the Agency's agriculture sector programming over this same period.
- In 2011, this trend began to be reversed as the Agency began to invigorate spending on both the Global Climate Change and Feed the Future Presidential Initiatives, both of which have water-related investment associated with them.

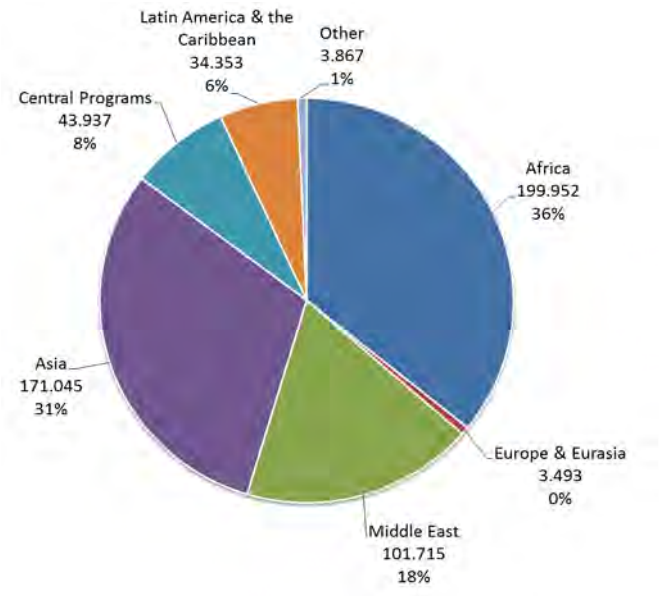
Below is a closer look at water funding in the most recent year for which we have reporting (FY2011):

**Figure 4 - Distribution of Water Funding by Theme (FY 2011)**




Even with the relative increase in water resources management and water productivity activities, we can still see that Agency water funding is dominated by WASH. This is due to the water earmark on the one hand, but is also driven by large capital and infrastructure investments, which occur primarily in Critical Priority Countries (CPCs) and the Middle East (Figure 3).

**Figure 5 - Distribution of Water Funding by Region (FY 2011)**




This geographic distribution of funding in FY11 is also fairly typical of past years (Figure 5):

- Over $200 million of all USAID water funding in FY11 was directed to Critical Priority Countries or Strategic Partner countries, most of which are in the Middle East and Asia.
- The balance of funding is distributed across 53 other countries and regional Missions (with a different mix of countries for each IR subsector).
- Africa region funding has also significantly increased with the earmark sub-attribution to Sub-Saharan Africa, representing 36% of the total in FY11.

The bottom line is that the earmark is likely to remain at least at current levels for the foreseeable future, and perhaps increase over time.

**Stay tuned for ongoing refinements in earmark attribution definitions and guidance!**

## Attributing Activities to the USAID Water Earmark: Digging Deeper

### Earmark Definition

The earmark definition has evolved over the years in consultation with Congressional representatives.

**FY2003-FY2007:** "Water supply and related" activities included domestic (drinking) water supply and sanitation services (hardware and software), and hygiene promotion only. (Water resources management or water productivity activities were not permitted. Large-scale wastewater treatment infrastructure was not permitted).

**FY2008:** The earmark definition remained focused on drinking water supply, sanitation, and hygiene (WASH). Also eligible were those activities related to water resources management and water productivity that have a demonstrable impact on WASH outcomes. These latter activities were virtually always only partially attributable to the earmark. Attribution criteria were developed by technical staff to assist in guiding Missions (Box 1).

**FY2009-2010:** The earmark definition remained the same as FY2008. Slightly modified appropriations language did permit a very small amount of flexibility to do non-WASH related activities at the level of the entire USAID water portfolio, however exemptions were negotiated in advance and received approval by the water Technical Earmark Group (TEG) and Regional Bureaus. Additional guidance was developed for attribution of some development-oriented IDA funded activities to the earmark.

**FY2011:** Due to the all year Continuing Resolution, there was no official hard water earmark during this year, although most Bureaus/Missions maintained WASH sector funding levels and adhered to previous year definitions.

**FY2012:** The water earmark definition shifted back to the WASH-centered definition of FY2008, in part because of the increased availability of other streams of funding that could be applied to water resources management (WRM) or water productivity (WP) activities (e.g., from Global Climate Change-Adaptation or Feed the Future). Partial attribution for WRM or WP activities

**Box 1 - Criteria for meeting the water earmark (2008-2012)**

- An activity must state as a primary or secondary objective increased access to drinking water supply or sanitation services, better quality of those services, and/or hygiene promotion. The objective may correspond to either direct or indirect support as defined in water management, water productivity or water security, but it must make explicit the linkage to drinking water supply, sanitation or hygiene outcomes.
- Activities must identify objectively verifiable indicators and targets that track progress towards the identified drinking water supply, sanitation, and/or hygiene objective. To the extent possible, the use of common FACTS indicators is encouraged. For those interventions that do not lend themselves to the standardized FACTS indicators, activity managers may also develop customized indicators to track progress.
- In programs that include both earmark eligible and non-eligible activities, funding may be attributed to the earmark only in proportion to the activity's support of the earmark definitions provided here.

that have a direct impact on WASH outcomes was still possible according to this definition, but not the case-by-case exceptions of FY2009-2010.

**FY2013:** The appropriations bills under consideration differ across the House and Senate – with the former holding steady at $315 million for the water earmark, and the latter proposing an increase to $400 million. No decisions have been made about earmark definitions or eligible funding accounts.

### Funding Accounts

As of FY2012, funds may be attributed to the water earmark from most funding accounts, including Development Assistance (DA), Global Health and Child Survival (GHCS), Economic Support Funds (ESF), Andean Counterdrug Initiative (ACI), Support for East European Democracy (SEED), Freedom Support Act (FSA), International Disaster Assistance (IDA), or Transition Initiative (TI), with the following stipulations:

- Check the latest report language to see whether there is a minimum amount of the earmark that must be met from the DA account (in some years this has been as much as $150 million of the total).
- While the earmark is supposed to be met with non-disaster/humanitarian resources such as IDA and/or TI account funds, when activities implemented with these funds meet the above requirements for eligibility and are substantially similar to development-oriented WASH activities they will be counted towards the earmark. These funds cannot be used for planning purposes, however, and will only be attributed towards the earmark retrospectively.
- Any separate or additional guidelines on the use of GHCS funds for water-related activities should be consulted.
- No funds may be attributed towards this earmark from either the PL-480/Title II (Food For Peace) account or any supplemental appropriation.

### Funding Streams

There are numerous other funding streams available that are not focused on the water or WASH sector, but which in fact are regularly used to support water-related activities in the Agency. (Figure 6)

Besides the water earmark, these include:

- Global Health accounts related to Maternal and Child Health,
- Nutrition or HIV/AIDS,
- Feed the Future Initiative,
- Food for Peace/Title II,
- Global Climate Change Funding for both Adaptation and Mitigation,
- Biodiversity earmark funding, and
- most flexible of all, ESF or CPC funding.

All of these directives and earmarks have directly funded some aspects of WASH except biodiversity (also some co-programming of WASH and Biodiversity has occurred, e.g., in protecting upper watershed ecosystem services for downstream potable water supply).

**Figure 6 - Potential USAID Water funding sources**

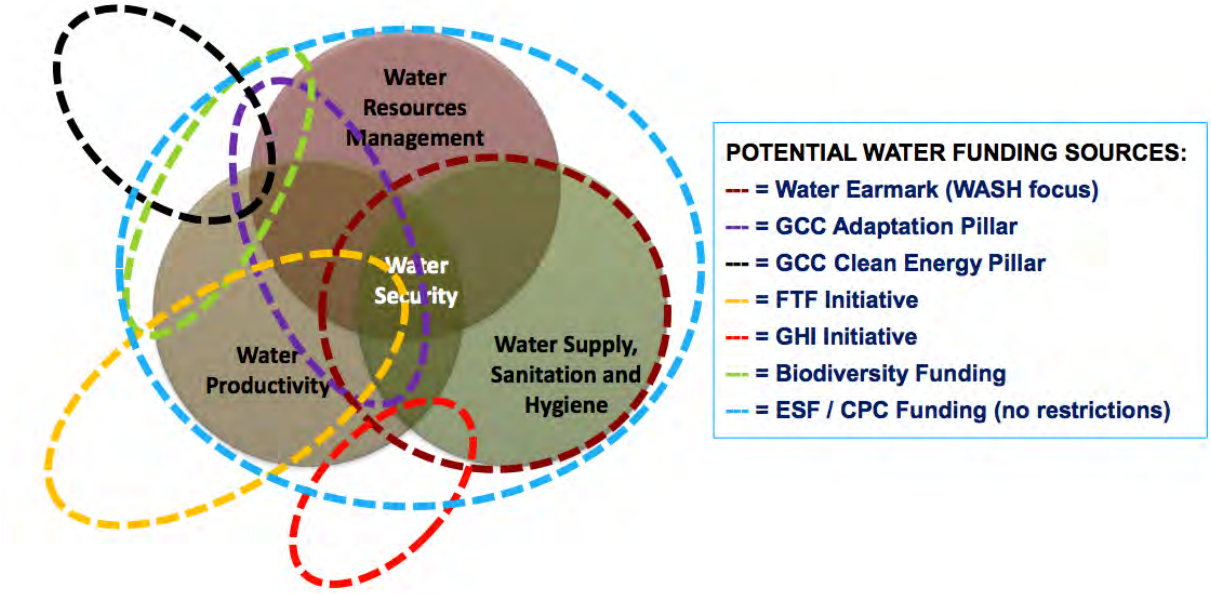


**Table 2 - Illustrative water activities and possible funding sources**

| Illustrative Water Activity Area | Possible Funding Sources<br>X = direct funding/100% attribution possible<br>(X) = indirect or partial attribution possible | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Water Earmark (including MCH and PEPFAR GHI sources)*** | **Biodiversity Earmark** | **GCC-Adaptation** | **GCC-Clean Energy** | **Feed the Future** | **Title II (Food for Peace)**** | **Other** (including unrestricted DA, ESF, IDA, etc.) |
| ***WASH (Water Supply, Sanitation, Hygiene)*** | | | | | | | |
| All "normal" domestic water supply, sanitation, and hygiene (WASH) activities – e.g., urban and rural domestic water supply systems; latrine and sewage collection systems; (no large wastewater treatment) hygiene behavior change including handwashing and household water treatment – both hardware and 'software' | X | | | | | X (in practice, primarily small-scale rural WASH interventions; longer term policy, institutional strengthening or capacity building excluded) | X |
| Provision of water services that provide water for both domestic purposes (e.g., drinking water) and for productive purposes (e.g., gardening, small-scale agriculture or husbandry, small-scale enterprise) – i.e., Multiple Use Services (MUS) – both hardware and 'software' | X | | | | X (assuming productive activity is agriculture related) | X (see above) | X |
| Improved utility operations – including better drinking water quality treatment, reduced leakage or non-revenue water in the system, improved financial sustainability, etc.) (NOTE: separate or combined utilities addressing drinking water supply, sewerage and wastewater utility strengthening are eligible) – both hardware and 'software' | X | | | (X) (municipal utility water-energy efficiency programs (e.g., Watergy)) | | | X |
| Some activities in water resources management or water for productive | X | | | | | X (usually at | X |

| Illustrative Water Activity Area | | Possible Funding Sources<br>X = direct funding/100% attribution possible<br>(X) = indirect or partial attribution possible | | | | | |
|---|---|---|---|---|---|---|---|
| | **Water Earmark (including MCH and PEPFAR GHI sources)*** | **Biodiversity Earmark** | **GCC-Adaptation** | **GCC-Clean Energy** | **Feed the Future** | **Title II (Food for Peace)**** | **Other** (including unrestricted DA, ESF, IDA, etc.) |
| uses, if a direct linkage can be made to positive WASH outcomes – but usually only partial attribution is allowed (e.g., protection of watersheds where water is used for multiple purposes) | | | | | | smaller watershed scale - longer term policy, institutional strengthening or capacity building excluded) | |
| National or local (e.g., municipal) assessments of climate vulnerability specifically of WASH services (e.g., drinking water supply sources, types of sanitation systems, etc.) | X | | X | | | X<br>(linked to DRR programming, for example) | X |
| Capacity building of WASH service providers in climate change adaptation approaches | X | | X | | | | X |
| Development of scalable technologies/ approaches to build more climate resiliency of WASH services | X | | X | | | | X |
| Use/application of scalable technologies/ approaches to build more climate resiliency of WASH services | X | | X | | | X | X |
| Strengthening of overall hydrologic/meteorologic data and information management for decision-making/planning, including future climate projections | (X)<br>(maybe 10-15% attribution) | | (X)<br>(partial attribution – depending on degree of water-related climate risk and use of information for increased resiliency) | | (X)<br>(partial attribution – depending on amount of agricultural water use in that basin or aquifer system) | | X |

| Illustrative Water Activity Area | | Possible Funding Sources<br>X = direct funding/100% attribution possible<br>(X) = indirect or partial attribution possible | | | | | |
|---|---|---|---|---|---|---|---|
| | **Water Earmark (including MCH and PEPFAR GHI sources)*** | **Biodiversity Earmark** | **GCC-Adaptation** | **GCC-Clean Energy** | **Feed the Future** | **Title II (Food for Peace)**** | **Other** (including unrestricted DA, ESF, IDA, etc.) |
| ***Water Resources Management*** | | | | | | | |
| Basin/watershed management, including policy and enabling environment reform, laws and regulations, institutional strengthening, governance, hydrologic data and information management, etc. | (X) (maybe 10-15% attribution) | (X) (maybe partial attribution, assuming the basin/watershed has documented high biodiversity value) | (X) (maybe partial attribution, assuming the basin/watershed has high vulnerability to GCC) | | (X) (partial attribution – depending on amount of agricultural water use in that basin) | X (usually at smaller watershed scale - longer term policy, institutional strengthening or capacity building excluded) | X |
| Conservation of aquatic biodiversity – including biologically significant ecosystem services | | X *(assuming all four BD criteria met)* | | | | | X |
| Wastewater treatment plants (construction) | (X) for very small-scale community systems only (no large-scale wastewater treatment plants) | (X) (in very few cases where industrial or domestic pollution can be explicitly identified as a significant threat to high value BD) | | | | | X |
| ***Water Productivity*** | | | | | | | |
| Irrigated agricultural water efficiency programs | | | | | X | X | X |
| "Green water" agricultural water efficiency/productivity (through conservation agriculture, soil and water conservation, rainwater harvesting, small-scale supplemental irrigation, etc.) | | | | | X | X | X |
| Integrated Pest Management activities that reduce agricultural chemical use and protect water quality | | | | | X | X | X |

| Illustrative Water Activity Area | | Possible Funding Sources<br>X = direct funding/100% attribution possible<br>(X) = indirect or partial attribution possible | | | | | |
|---|---|---|---|---|---|---|---|
| | **Water Earmark (including MCH and PEPFAR GHI sources)*** | **Biodiversity Earmark** | **GCC-Adaptation** | **GCC-Clean Energy** | **Feed the Future** | **Title II (Food for Peace)**** | **Other** (including unrestricted DA, ESF, IDA, etc.) |
| Development of water sources/services that provide water for both domestic purposes (e.g., drinking water) and for productive purposes (e.g., gardening, small-scale agriculture or husbandry, small-scale enterprise) – i.e., Multiple Use Services (MUS) | | X | | | X (assuming productive activity is agriculture related) | X | X (longer term policy, institutional strengthening or capacity building excluded) |
| Industrial 'cleaner production' and pollution prevention | | | | (X) Programs focused on industrial energy efficiency (end-use) will likely also increase water use efficiency and reduce water pollution | | | X |
| Hydropower generation-related activities | | (X) (e.g., for environmental mitigation, environmental flow management, and/or Environmental Impact Assessment when proposed hydropower is an identified significant threat to BD, and all BD code criteria are met) | | X (for direct hydropower development; Note that some hydropower activities related to environmental management (for example upstream sediment control), or for environmental mitigation (e.g., Environmental Impact Assessment and Mitigation for hydropower plants) may also be eligible for attribution) | | | X |
| End-use energy efficiency programs that also result in end-use water efficiency (e.g., "Watergy"/Water-Energy Nexus programs) | | | | X | | | X |

### Table task – Where does it go?

On the wall is a large diagram with 3 concentric circles:

- Water for the Poor Act
- Water Earmark – partial attribution only
- Water Earmark – 100% attribution

Each table has a set of large post-its with typical USAID “water activities” listed on each. Table team members consult each other and decide where each activity “fits” in the diagram at the front of the room, and place post-it there.

**HINT**: Many activities fit into more than one level – choose the most strictly defined level the activity could meet

**EXTRA CREDIT**: Place a “dot” on the card if you think another earmark or Initiative beyond the water earmark could also support the activity (and be prepared to defend your answer!)

### Partial Attribution

Determining the 'correct' partial attribution is not an exact science, but should be based on the core idea of contribution to WASH outcomes, and the principle of 'reasonableness' of the amount being attributed.

Here are a few guiding questions that may help you to make an estimate of what can be justified as an attribution.

**What percentage of the water protected by general watershed management is used for potable consumption?**

One of the most common ways to attribute broader water resource management activities is by looking at the proportion of overall water resources in the given watershed or catchment that is used for domestic water supply vs. other uses. This is usually around 10-15% of the total.

**What proportion of the beneficiary population within the watershed will receive measurably improved drinking water or sanitation from this intervention?**

While this may be possible in some cases, attribution gets a little tricky if there are very large urban areas in the target region whose potable water supplies come from an upstream watershed. Under such a scenario 90% or more of the population in an area could be considered 'beneficiaries' of a water resources management activity in the watershed. But attributing such a high proportion of water resources management activities to a WASH-focused earmark might be hard to justify unless you can demonstrate a direct, tangible, positive, and predominant impact on WASH services as a result of the intervention.

**Does my activity address surface water or groundwater quantity or quality? How does this correspond with the actual sources of drinking water in the area?**

Let's say that you are trying to attribute some of a watershed soil and water conservation program to the water earmark. If you are working in an area where 100% of the drinking water comes from 100 m+ deep boreholes, it would be difficult to justify attributing the watershed management activity that mainly affects surface water and shallow groundwater to your interventions.

**Can you prove that the treatment of wastewater reduced the need to treat drinking water before consumption? What proportion of the treated wastewater is used as a drinking water source? Did small-scale wastewater treatment contribute to the sustainability of water supply or sanitation services?**

If you are going to try to attribute any environmental management activity to the water earmark, there must be a direct linkage to the provision of drinking water, sanitation, or hygiene services and practices. Just treating wastewater from a large treatment plant before discharge into a water body (e.g., river, lake), does not necessarily mean that much or any of this water is actually used in an improved drinking water supply system, or that there are sanitation/health or service sustainability benefits from the investment.

Be conservative in doing these estimates of partial attribution – typically you will find that general water resources management activities fall into the 10-20% range. Water productivity activities are typically harder to justify, and would be evaluated on a case-by-case basis.

Whatever the justification, it needs to pass the 'reasonableness' test in terms of a logical argument that is not overly convoluted or with two many assumptions or causal links explaining the connection to domestic water supply or sanitation.

**Helpful hints:**

**Follow the money**

What proportion of the overall activity budget is spent on activities that are WASH-related?

**Be conservative in your estimates**

What is the reasonable linkage of this activity to WASH outcomes? Make sure attribution of all water resources management or water productivity activities appropriately assigns the percentage of benefits associated specifically with WASH outcomes.

## Earmark attribution is an art and a science….
## ….. But you are not alone!

USAID technical staff in Washington can help Missions (and their partners):

- Understand if a proposed activity will meet the earmark, and what is reasonable to attribute
- Design or modify an activity so it can meet the definition of the earmark

## NOTES

## NOTES

## CHARACTERISTICS OF WATER SUPPLY SYSTEMS IN DEVELOPING COUNTRIES: IMPROVING SERVICE AND ACCESS

**Key Messages:**

- Have to think beyond direct service delivery - sustainability requires an approach to governance, financial, technology and environmental issues.
- There should be a focus on incremental improvement while committing to the longer term.
- Needs and costs are huge – it is imperative that resources are used for the greatest value.
- USAID brings skills in financing, partnerships, and “the software.”

## Realities affecting the WASH sector

The session is an overview of the challenges to providing safe and sustained water to people in developing countries – and some options for overcoming the challenges.

We will explore the different challenges that exist depending on whether people live in urban, rural or peri-urban areas and examine some of the effective responses employed by USAID and others in addressing these challenges.

To do this, it is first important to recognize some of the realities affecting the WASH sector.


So while the trend is toward urbanization, there has to be a balance of attention between the current rural needs and the growing urban needs.


In order to meet the MDGs, developing countries have a long way to go financially.


Given the fact that utility coverage is lagging – and financial resources are deficient for the sector overall – we have to pay attention to the way in which people are actually receiving water.


Piped network water is certainly the safest to drink and the most economical to provide in the long run – but in urban areas, the formal utilities have been unable to expand to keep up with the enormous growth in urban populations.

## Water service providers

There are four main catagories of water service providers:

**Communities**

Rural water supplies are often operated and maintained by community organizations. But we can also see community management in slums and peri-urban areas.

**Utilities**

A utility is the urban entity that manages and operates the facility needed to abstract water from the source, treat water, and transport it to households through taps or to public stand posts where you buy water by the bucket.

**Small scale Providers (SSPs)**

There is a range of names for these providers – vendors, small-scale providers, small private operators, alternative or informal providers. Just as they have many names, SSPs have many forms. They can be for profit or non-profit, co-ops, entrepreneurs, or family owned.

**Self-supply**

These systems are entirely financed by the households themselves. In some countries, governments officially resist Self-Supply as a legitimate approach, since they don't see it as 'modern' – but advocacy on the part of WASH organizations (like UNICEF) is changing minds. With targeted technical assistance most self-supply sources can relatively easily be brought up to MDG.

## Source and technology

There are two basic water sources – groundwater or surface water.

Surface water sources:

- River/pond collection
- Rainwater harvesting
- Spring protection
- Gravity-fed schemes
- Piped networks

Groundwater sources:

- Hand-dug wells
- Tubewells and boreholes (manual or mechanized pumping)
- Piped networks

**Sustainable services**

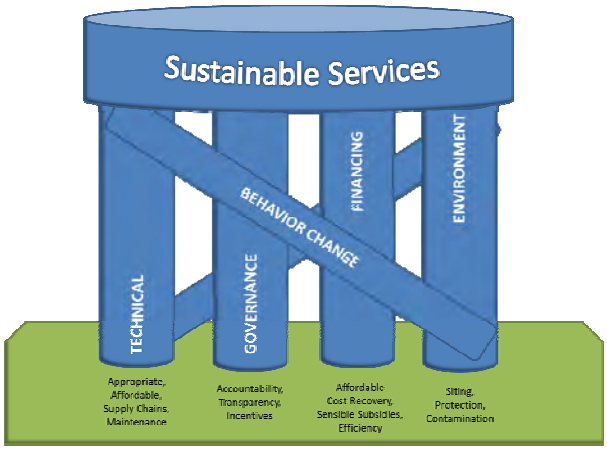
As important as the source of water is the ability to plan for sustainable service.

Experience among the donors and NGOs shows that there are four main pillars to sustainability to consider during design:

1. technical,
2. governance,
3. financing, and
4. environment.

Supporting all these pillars is the concept of behavior change – or adopting a new way of approaching these aspects of programming.

**Figure 7 - Pillars of sustainable water services**




### Table Task

At your tables, review the image on the screen and consider the following questions:

What do you see that is wrong here?

What could have caused this situation?

**HINT:** Remember the four pillars of sustainable services.

## Improving rural services

USAID invest in rural services enough to make improvements, but not to deliver service throughout rural areas. However, by thinking about the context of service delivery rather than an individual project and focusing on the following three areas, USAID can have an impact in other ways.

1. **Focus on Big Picture**
   - Look at sector overall – opportunities to strengthen sector reform.
2. **Help develop links Beyond Community for operational sustainability**
   - Working thru community and creating accountability at that level makes sense, but to craft truly sustainable solutions, you have to look beyond the village.
3. **Create Financial sustainability (or first steps toward sustainability)**
   - Acknowledge that rural systems may need a degree of government subsidy.
   - Balanced with need to develop ownership

## Urban water supply

Utility coverage in the urban areas is actually declining. What is happening?

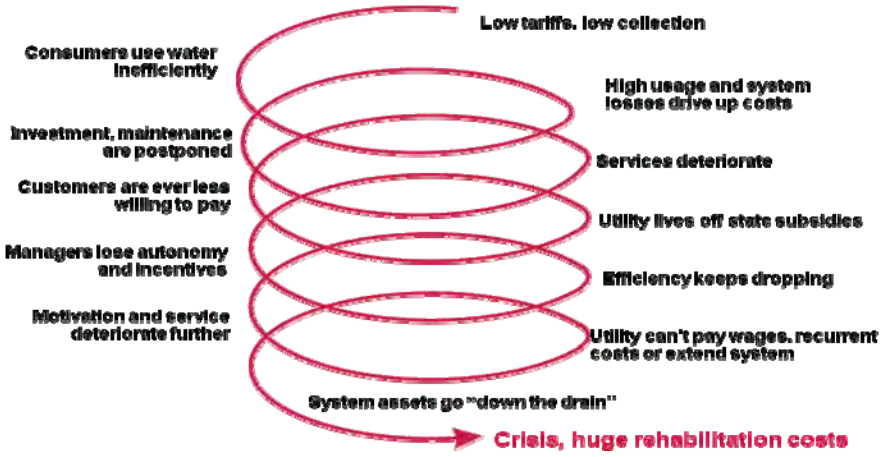
The issues typically start with **low cost recovery**, either because tariffs are set too low or because utilities are unable to collect, due to a range of factors, what they are owed against bills.

**Low prices** provide no incentive for **demand management**. Lack of adequate income limits **ability to either expand** or increase service – or **maintain infrastructure**.

This results in high leakages. As there is less water to sell, the relative operating costs are higher and more quality problems emerge.

The result is a downward spiral of poor service including low pressure, poor quality and a lack of continuity.

**Figure 8 - Factors of a dysfunctional water service**



### Table Task – TUBIG Water Company (TWC)

With your table, identify interventions that might be used to stop the death spiral outlined in the TWC handout.

Use the space below to take a few notes.

### Urban water supply: utility reform and governance

Water utilities still provide the safest and most economical solution and reform is a feasible remedy for sustainability. These improvements typically happen in several layers:

- setting out the right policy and regulatory framework,
- rationalizing the sector structure,
- re-allocating responsibilities, and
- making improvements within the utility.

**Sector efficiency**

Aligning and strengthening the various sector institutions to create better accountability, efficiency and transparency with a long term goal of financial sustainability.

**Utility efficiency**

Core is corporatization where utility takes on commercial orientation of a private company.

**Re-assigning sector responsibilities**

Contracting certain functions can be very effective because it serves to clarify obligations and expectations and allows for risks to be shared. Regulators play a role, which should be distinct from operations.

## Peri-urban water supply small-scale providers

When the utility doesn't function, isn't affordable, or doesn't reach everyone – people have to get water in other ways. Small-scale providers (SSPs) are prevalent throughout the developing world – but also have their issues.

**Lack of oversight and regulation.**

**High prices.** SSPs charge much more for water than a customer connected to the network.

**Quality issues.** There are many cases where the water – even if the quality was reasonable to start with – is contaminated through the way it is conveyed to the customer or the source itself. But SSPs are undoubtedly part of the service provision chain for some time – so need to find ways to formalize service and bring them into partnership with the utility and government

**Table 3 - Comparing urban African city of population served by utility vs. SSP**

| City | Urban Pop. Supplied by Utility | Urban Pop. Supplied by SSPs |
|---|---|---|
| Dar es Salaam Tanzania | 46% | 39% |
| Nairobi Kenya | 50% | 50% (including 60% of urban poor) |
| Khartoum Sudan | 33% | 95% of poor residing in informal areas |

### Improvements

**Dependent water** SSPs (tanker, kiosk, standpipe operator) have relationship with utility that can be leveraged for better service

**Independent water** SSPs (small networks, borehole operators) are harder to regulate and other institutions may have to be involved in oversight.

There are two aspects to keep in mind:

1. SSPs are businesspeople. They will move into a market vacuum and are demand driven.
2. Supporting SSPs can be seen as pro-poor. If service is reasonably priced and services are of adequate quality, SSPs can be an effective way to reach poor people.

## Dealing with New technology

There will always be new technologies and gadgets, which may or may not be cost effective and appropriate at scale. But the solution is more likely to be about new approaches to problems and new applications of technology:

- Better contracting mechanisms and sector arrangements to allow for small piped systems.
- Designing for multiple use systems.
- Better mapping and use of geospatial data.
- Bringing down the costs of boreholes.
- Integrating technologies to support cost recovery and sustainability.
- Diversification for water security - Seawater, Recycle / reuse (NEWater), Rainwater collection.

### Video - Gundfos Lifelink

Watch the video and take a few notes thinking about the following questions:

How would you respond?

What are the pros and cons of what was presented?

## NOTES

## NOTES

## Daily Resources

**Water**

- Economic regulation of water

# ECONOMIC REGULATION OF WATER

## SUMMARY OF KEY ECONOMIC REGUALTORY TASKS AND FUNCTIONS

| Tasks → / Functions ↓ | Price Regulation | Service Quality Regulation | Competition Regulation | Consumer Protection |
|---|---|---|---|---|
| ***Gather information and data*** | | | | |
| | • Get information on current and projected tariff revenues and costs<br>• Get information on willingness-to-pay, for alternative service levels | • Obtain information on current service levels<br>• Carry out technical studies | • Obtain information on illegal conduct or monopoly behaviour | • Conduct customer Surveys<br>• Organise call centres to file complaints |
| Monitor the implementation of existing rules | | | | |
| | • Audit financial accounts<br>• Ensure that adequate tariffs are charged | • Monitor that levels of service are met<br>• Monitor that coverage targets are met | • Investigation of abuses of monopoly power – predatory practices, etc… | • Administrative audit of systems and procedures in place to educate customers, and share information |
| Determine rules | | | | |
| | • Tariff reviews, linked to inflation or tariff rebasing<br>• Modify tariff structures and payment methods | • Define or review quality standards<br>• Adapt existing quality standards to real needs | • Organise bidding process<br>• Rule on competition case following complaint | • Define consumer service standards or requirements |
| Enforce decisions | | | | |
| Enforce decisions | • Define tariff adjustments on basis of performance<br>• Apply penalties | • Require improvements in service quality | • Mandate break-up of monopoly power or changes in access terms | • Resolve dispute between consumers and regulated firm |

**Identifying Best Practices in Pro-Poor Regulation of the Water Sector,** Sophie Trémolet, Catherine Hunt and Aurélie Grangé, ***BNWP – WSS 090, 2005, Report for the World Bank***

Day 2

## SANITATION

**Key messages:**

- Don’t forget sanitation in USAID programming.
- Sanitation is more than just latrines.
- Draw on existing USAID expertise and resources.

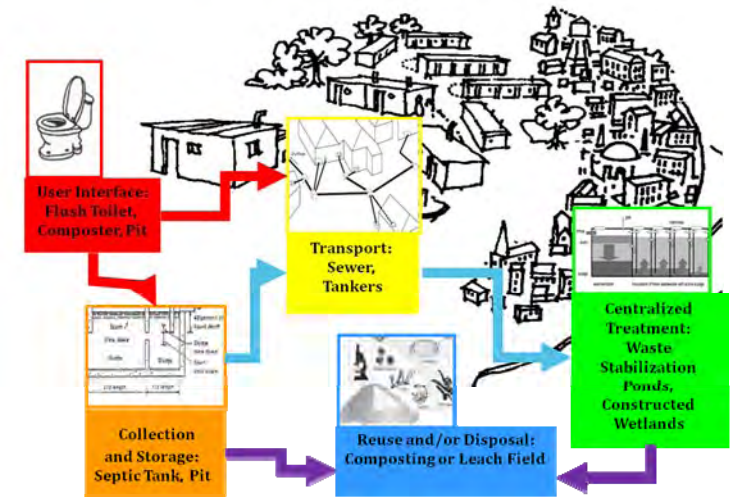
## Sustainability

Keep in mind the four pillars of sustainability as it is applied to sanitation - Technological, Environmental, Governance, and Financial - plus the human dimension that is particularly important for sanitation – **Behavior Change**.

Behavior Change is a cross cutting element that supports and reinforces all of the pillars, but especially for sanitation – there are a lot of cultural and social issues related to how humans individually and as a society dispose of their excreta.

### Technological sustainability

**Figure 9 - Where does it go? Source: SuSanA.org**




There is a range of activities and technologies involved in providing sustainable sanitation, starting from the user depending on whether the sanitation is “onsite” (stays where it is dropped), or “piped”. And eventually onsite sanitation is going to need emptying, so how to do that without putting human health at risk is also part of the sanitation discussion. Now let’s consider what it takes to achieve sustainability in this system.

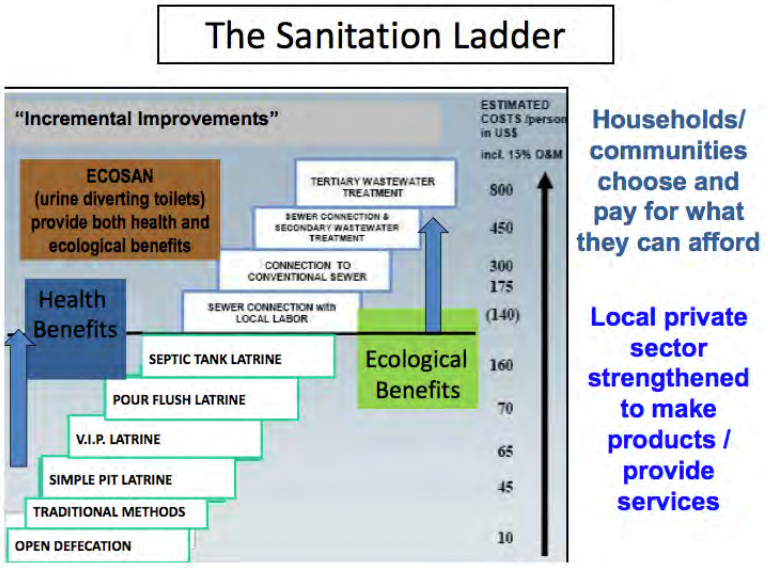
**Appropriate technology criteria:**

- Affordable
- Easy available to consumers in that location
- Culturally acceptable – this is especially important in the sanitation realm because there are so many sensitivities and taboos around human waste, and so many unique cultural practices
- Easy to use and maintain – just as in water supply, overly complicated technologies that require a lot of attention, or special skills to operate or maintain are not the best choice in most places, and will quickly fall into disrepair or simply not be used.
- And related to this, the technologies chosen must be within the capability of local people – either the users themselves or local technicians – to construct, maintain/repair and replace over time.

### Sanitation ladder

Instead of prescribing a single, one-size-fits-all solution to a community’s sanitation needs, people are given a choice of what they want and can afford within this “ladder” of increasingly sophisticated – and expensive – options. Figure 10 illustrates the sanitation ladder, but let’s look at it in more detail.

**Figure 10 - Sanitation ladder**




The emphasis is on moving a community away from defecation in public spaces, while still ensuring that the most appropriate and affordable technology is selected and used, which indicates a range of options.

This demand-driven approach must also be accompanied by ensuring that local providers are available to produce and sell the products desired at an affordable price.

At higher levels of the sanitation ladder, with piped sewers and wastewater treatment, all of the health benefits have been captured, and the additional costs lead to ecological benefits.

The ECOSAN, or urine diverting models of sanitation sit right at this intersection, because, when installed and used properly, they can provide both health and ecological benefits.

### Group Task – Discussion

Think about the following questions and take a few notes.

What sanitation technologies have you observed in the city where you live? In the rural areas of your country?

Share an experience of how a sanitation technology was appropriate or *not* for the context.

### Environmental sustainability

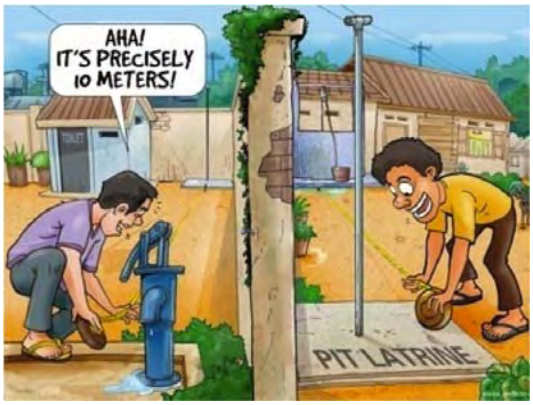
Earlier we discussed the potentially serious downstream environmental impacts of sanitation waste that is not treated before being released into the environment. This includes waste from all sanitation technologies, and includes both liquid waste and solid waste. Two important aspects to consider:

- **Avoid water quality contamination.** Considering that the Millenium Development Goals (MGDs) for sanitation and most domestic sewage systems in developing countries don't treat their sewage, environmental sustainability requires good siting and design of sanitation facilities.
- **Consider water quantity (availability and scarcity)** in choosing sanitation technologies. The average toilet flush consumes more than 6 liters of water, and even high efficiency toilets use over 4 liters per flush. As more residents of developing countries are hooked up to urban sewer systems, and convert to water-based sanitation technologies (i.e., flush toilets), this will become an issue of increasing importance.

### Regulation 216

Everybody lives downstream!

USAID environmental compliance rules *do* require us to consider the pollution impacts of any sanitation interventions and address them if possible. Although large-scale wastewater treatment systems may be outside the realm of USAID's control, sanitation programs should consider such issues as latrine and septic system siting, good design, and sludge disposal related to on-site systems.




### Pair Task – The taboo of poo

With a partner, share how people in your country, ethnic group, culture, or family act and feel when discussing human feces and urine. Consider the following questions to guide your conversation:

- What emotions arise? (embarrassment, shame, fear, disgust, nervousness)
- What vocabulary do you use? (formal, scientific, 'baby talk', 'bad words', humor)
- How do you change the tone/vocabulary in different settings?
- How does your personal reaction to this issue differ from other cultural / ethnic / gender / family groups that live in your country?

### National level

This discomfort around public discussion of human feces is a major factor in the lack of policy prioritization of sanitation, which can be a severe governance obstacle. Other contributing factors to sanitation being labeled as the 'forgotten child' include:

- **The lack of strong enabling environments and institutional structures** to support sanitation promotion and investment as an equal priority to water supply.
- **The institutional framework for sanitation is often fragmented**. The different elements of the supply chain—from hygiene promotion, to latrine construction, to latrine emptying—are in the hands of different public and private players, with multiple actors often present at each stage.

### Community and local level

Moving down from the national level, there are important governance factors to consider at the community and local level as well.

- **Strong local government/community governance and participation in decision-making through demand-driven approaches.** In both urban and rural contexts, participatory decision-making to ensure demand-driven solutions and 'ownership' of all sanitation approaches adopted is a cornerstone of sanitation programming.
- **Gender equity and engagement of women.** The important role of women and girls in mobilizing community demand, designing, sitting, financing, maintaining, and operating appropriate sanitation systems must be recognized and gender considerations factored into every program.
- **Utility reform principles for networked sewage and wastewater treatment.** Many of these systems are owned, operated and managed by the same large utility water suppliers and the same principles of improved corporate management and responsibility apply to the sewerage, drainage, or wastewater side of these utilities.

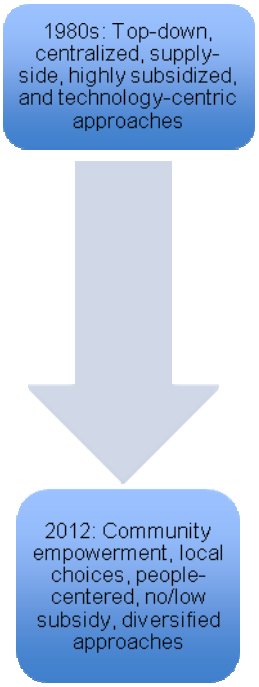
**Suggested read - New York Times**

MUMBAI, India — Men and women here in India's largest city, a congested, humanity-soaked metropolis of roughly 20 million residents, would seem bound by at least one common misery: far too many people sharing far too few toilets. Public bathrooms in Shivaji Nagar, a Mumbai slum where one estimate puts the ratio of toilets to people at 1 to 300.

Read the full article here: http://www.nytimes.com/2012/06/15/world/asia/in-mumbai-a-campaign-against-restroom-injustice.html?_r=2&hp

**Image 1 - NY Times Prashanth Vishwanathan, A woman in Mumbai, India, washing the feet of her child outside an open toilet on stilts where the waste goes directly into an open water source.**

**Evolution of Sanitation Programming – Example: Community-Led Total Sanitation (CLTS)**




In general, the evolution in governance within the sanitation field has shown a shift away from top-down, centralized, supply-side, highly subsidized, and technology/hardware-centric approaches to greater emphasis on community empowerment and demand-driven, low/no-subsidy approaches.

CLTS is a participatory community-based approach to sanitation that was formulated in Bangladesh by a man named Kamal Kar, and is now being adopted and adapted in other countries around the world.

CLTS departs from traditional and historical approaches to sanitation in developing countries, which have not worked very well or proved sustainable over the years. Table 4 below, compares traditional sanitation with the CLTS approach.

**Table 4 - Traditional sanitation versus CLTS**

| Area of Major Shift | Traditional Sanitation | CLTS Approach |
|---|---|---|
| Toilet designs are those of: | Outside engineers | Insiders and community engineers |
| Indicators of measurement of change | Number of toilets built | Number of open defecation-free (ODF) communities |
| Major inputs | Sanitary hardware, subsidies those are expensive | Software/training and capacity building |
| Outsider's attitude, motive and intentions towards insiders | Helping, donating, philanthropic | Agents of triggering local empowerment and initiators of collective local action |
| Outsider's role | Teaching, advising, prescribing and supplying hardware | Facilitating a process of change and empowerment |
| Major outcome | Increased number of latrines | ODF communities and no shit in the open |
| Major emphasis given on: | Toilet construction | Empowerment of people |
| Mode of learning | Verbal | Visual/by doing |

*Motivation*

One of the major lessons learned from CLTS is that getting people to adopt sanitation may not depend entirely – or even primarily – on **health-driven** motivations.

Many other things may be going on as motivating forces driving people to want and to use improved sanitation approaches:

- **Respect or prestige** - the CLTS process may have created a social norm where a latrine indicates higher status.
- **Personal comfort, self esteem** - the desire for a sanitary way to deal with human feces comes from very personal concerns about comfort or self-esteem.
- **Convenience** - demand created by the CLTS activities, and Total Sanitation/Sanitation Marketing for the first time makes it convenient to invest in a toilet, by providing the entire package from one agent.

### Video – CLTS 2012 UNICEF, Chad

Take a few notes as you watch the video.

### Group Task - Discussion

In the video you just saw – what were some of the factors that supported private sector to meet the demand created by CLTS?

**Image 2 - Community Mapping, source: Huffington Post.com**

### Financial sustainability

Some major lessons learned in the financial realm include:

**Community and household scale**

The trend is towards either no or low subsidy approaches that focus both on creating demand for sanitation which people pay for largely themselves. This is coupled with sanitation marketing on the supply-side to provide ways for people to actually access affordable and appropriate sanitation technologies. On the demand side we have seen how approaches such as CLTS are being adopted around the world. On the supply side, we'll talk a bit more about sanitation marketing in a minute.

**Utility management**

The major trend is towards management models that focus on cost-recovery through user fees, reducing losses, etc., and overall getting the utility to a full financially sustainable state so it can access capital for system extension and upgrading.

**Access to credit**

An area of great interest and innovation is in the area of access to credit and other innovative financing to cover the capital costs of WASH infrastructure as well as financing of entrepreneurs engaged in the sector. USAID is a global leader in advancing models of larger scale financing of utilities, e.g., through supporting bond issues for utilities, as well as large revolving funds, at times with the assistance of our USAID development credit guarantees.

**Subsidy**

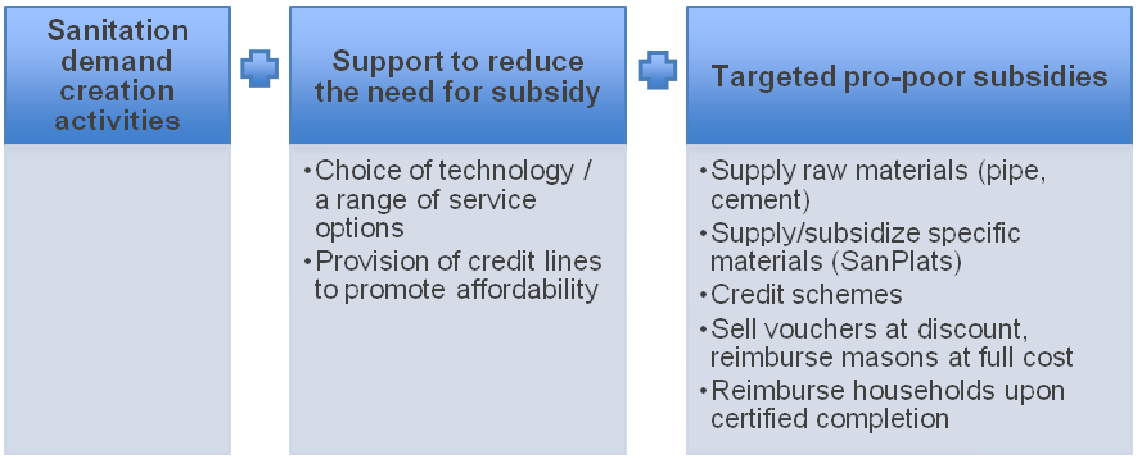
As discussed in the example of CLTS there is a trend in the sanitation sector towards no- and low-subsidies for individual household sanitation access. There have been many lessons learned on the questions of subsidy. Here are two major lessons to consider:

- **When systems are totally subsidized** there is no sense of ownership, less likely to maintain and use, hinders incentive to contribute at an affordable level, unsustainable
- **Access to poor still a challenge**, even with CLTS. Sanitation solutions can be capital intensive and subsidies may be necessary in some communities.

*The way forward*

State-of-the-art thinking, such as from the World Bank's Water and Sanitation Program's (WSP) Sanitation Global Practice Team[2], is a that flexible combination of no-subsidy and targeted subsidy approaches are the best.

[2] http://www.wsp.org/wsp/sites/wsp.org/files/publications/financing_analysis.pdf




**Sanitation Marketing: Supply sanitation goods and services as a business**

Sanitation Marketing is a systematic approach to assisting people to access and supplying appropriate and affordable sanitation goods and services through a market-driven business model.

A few of the key steps of this approach, which draws a lot from regular commercial marketing principles, include:

1. Conducting market research to find out what people want, and what they're willing and able to pay.
2. Developing a responsive set of products at the right price.
3. Carrying out marketing and promotion of the products, e.g., through demonstration centers or manuals that show the range of sanitation technologies available to people, and what each costs; and finally
4. Building capacity of local manufacturers and producers so that you have someone who can actually supply what people want in a sustainable fashion.

### Table Task – video

As you watch the video "Kibera Kenya - Understanding Small Scale Service Providers," reflect on the following questions, then discuss your observations at your table and be ready to share your findings with the full group.

- How are people making money in the supply chain of sanitation provision?

- What is working right? What could be improved to increase sustainability?

- How could 'sanitation marketing' approaches be effectively applied?

### Group Task – video

As you watch the video, "Marketing Sanitation in Rural East Java" take a few notes and be ready to discuss with the training group.

## Key messages

- Don't forget sanitation in USAID programming!!!
- Sanitation is more than just latrines!
- Draw on existing USAID expertise and resources:
    - Staff assistance
    - Education / outreach / technical materials available through www.ehproject.org and www.washplus.org

## NOTES

## NOTES

## HYGIENE

## Contribution of undernutrition to child mortality

17% of child deaths globally can be attributed to diarrhea, undernutrition contributed to 73% of these deaths - and is the underlying cause of 3.5 million child deaths each year in addition to stunting the physical and mental growth of 200 million children. 73% of the children who died from diarrhea would not have died if they had not also been undernourished.

In the latest data, diarrheal disease is now about 11% of child mortality, but although the mortality has gone down, the morbidity (number of cases of diarrhea) has not. Children are still getting 3-4 cases of diarrhea per year, which can affect their nutritional status and thus their physical and cognitive development for the rest of their lives.

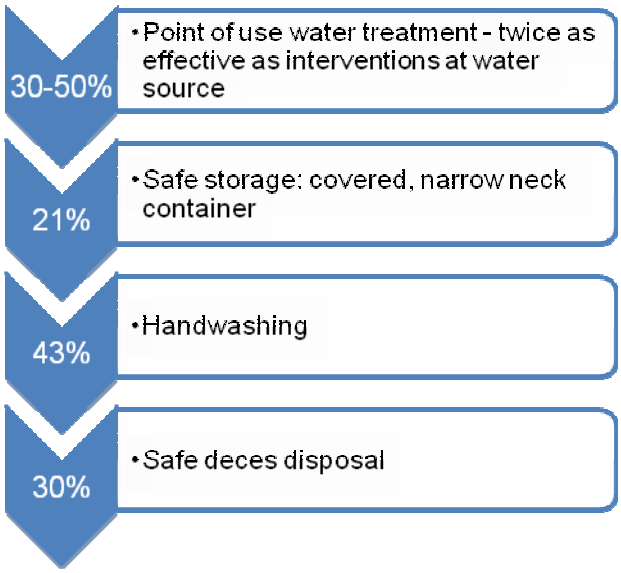
## WASH behaviors for Diarrhea Reduction

USAID focuses on four key hygiene practices, effective in reducing diarrheal disease in children under five - one of the top three killers of children in this age range.

1. Treatment
2. Water supply - safe storage
3. Handwashing
4. Safe feces disposal

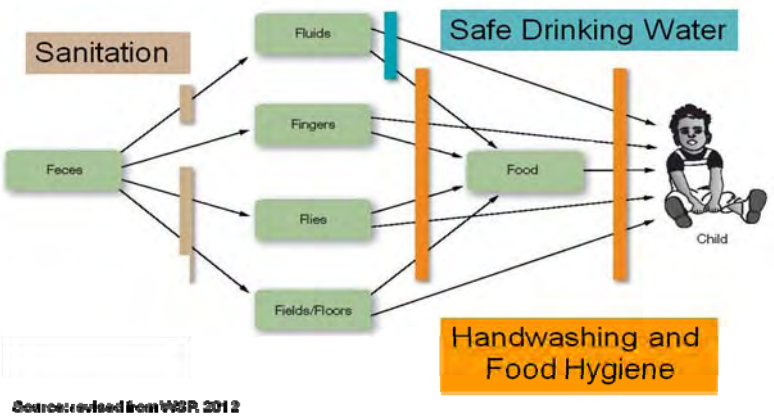
**Food hygiene** is a fifth that USAID is just beginning to engage more in with the integration of WASH and Nutrition becoming more visible with the Feed the Future Initiative.

Improving hygiene and sanitation practices can have a dramatic effecting on reducing both diarrheal disease and acute respiratory infections.



## Exposure

Figure 11 - "F" diagram




Source: revised from WSP, 2012

Eating food or drinking water that is contaminated with human feces generally causes diarrhea. Figure 11 shows the usual ways diarrhea germs reach people: via fingers, flies, fields and fluids to food or directly into the mouth.

The objective of hygiene interventions is to break the routes of transmission between feces and people (the new host).

- **Sanitation or Safe disposal of feces** prevents feces from contaminating water and the environment; prevents exposure to flies.
- **Water quality interventions** such as household water treatment and safe storage can help to remove contaminants from drinking water before it reaches the new host.
- **Food hygiene** tries to ensure that food is free from pathogens before it is consumed.
- **Water in sufficient quantities** enables people to wash food before cooking and eating it; wash surfaces, to bathe and wash hands.
- **Handwashing prevents** people from ingesting feces through dirty hands- used in feeding children and oneself and in preparing food.

### Food hygiene

There are small 'doable' actions that can greatly improve human to feces contamination, such as:

- Keep food preparation area clean
- Separate raw and cooked foods
- Cook foods thoroughly
- Store food safely
    - Time
    - Temperature
    - Covered containers
- Use safe water and fresh raw ingredients

### Water supply

Household drinking water can become contaminated in many ways. Here are some of the major contamination points to consider:

- **Source** water (e.g. rivers) can be contaminated by human and industrial waste before it reaches the consumer.
- **Transportation** of water is often accompanied with hand-to-container and hand-to-water contamination. This contact means that even the purest water from the best-protected source will be contaminated.
- **Storage and handling** in the home should ideally be in a container with a lid, ideally with a spigot or ladle to serve the water and should be stored in a clean place (not on the floor). If water is served with a cup- the user's hands can contaminate the water.

### Water treatment

Water disinfection at the point of use is another effective method of reducing human to feces contagion.

USAID recommends four household water treatment options that have an evidence base of health impact in the field.

1. **Chlorination** –USAID supports social marketing of several chlorine products – liquid sodium hypochlorite.
2. **Combined chlorine with flocculation with PUR® (Procter & Gamble).** Water treatment powder in a plastic sachet is recommended for 10 liters of turbid or muddy water. It is appropriate for use in areas where drinking water is taken from muddy ponds or rivers, and for emergency response.
3. **Filtration** - Ceramic filters depend on mechanical removal of contaminants. Users simply pour water through the filters. Biosand Filters are actually more similar to a wastewater treatment plant – there is an active microbiological layer that "digests" contaminants in addition to the filtration through different layers of sand and gravel.
4. **Solar Disinfection** uses a combination of UV light, and heat to inactivate pathogens in drinking water. Users are trained to place bottles in the sun for 1-2 days, depending on climate (6 hours if sunny, 2 days if cloudy).
5. **Boiling** - CDC recommends a rolling boil of 1 minute, in order to ensure that users do not stop heating the water before the true boiling point is reached. There is high potential for recontamination after boiling and prior to consumption. Water should be stored in the same container in which it was boiled, handled carefully, and consumed within 24 hours to prevent recontamination.

### Handwashing

There are critical times when handwashing has the greatest impact towards reducing the risk of hand-to-mouth contamination.

- After defecation
- After cleaning a baby's bottom
- Before preparing food/cooking
- Before eating/feeding a baby

Other factors to consider in hygiene programming that can facilitate handwashing are:

- A designated place for handwashing.
- Reducing the amount of water needed for handwashing – for example using a water saving device that allows a small trickle of water to be released for each handwash.

## Integrating hygiene improvement into existing health and development programs

There are some key entry points where hygiene can be integrated into existing health and development programs. Some examples of these are:

**Table 5 - Existing health programs and hygiene linkages**

| Entry point | Hygiene linkage |
|---|---|
| Child/Newborn Health | Linkage of prevention messages with oral rehydration therapy; integration of WASH in antenatal care; handwashing promotion for birth attendants and mothers/caretakers to prevent neonatal mortality. |
| HIV/AIDS | 90% of HIV/AIDS population suffers from diarrhea, which is the most common opportunistic infection. |
| Democracy and governance | Decision-making and management of local water resources (access/allocation, conflict resolution, and protection) as well as maintenance, operations, and cost-recovery related to water infrastructure (pipes, pumps, taps). |
| Education | Ensuring that schools have access to water supply and sanitation facilities. The availability of water supply and private, sex-segregated sanitation facilities at schools has been demonstrated to directly affect attendance levels of all students, but particularly of girls. |
| Agriculture | Attention to domestic water quality, sanitation and hygiene will support better health through a reduction in diarrhea, which will improve utilization of available food resources. |

## Behavior change

What do we mean by behavior change?

Hygiene behavior change aims to identify, promote and facilitate improved behaviors that:

- Have significant positive impact on health
- Are feasible to achieve, (people both willing and able to make changes)

### Strategy

Successful behavior change activities must be **desired, actual, and feasible.** To accomplish this there must be a clear strategy to achieve the desired behavior outcome. The below steps that need to be taken to develop this strategy.

1. Conduct Behavior Analysis. The first step in any behavior change activity is to find out what people are already doing.

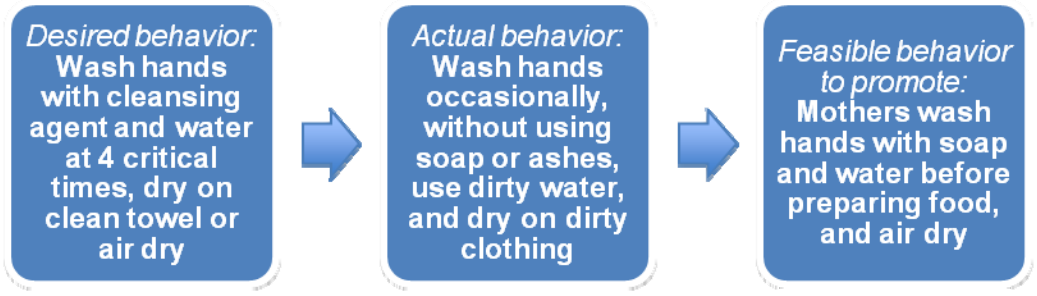
   Define target audience.

   Use research to identify motivators and barriers to achieving feasible behavior.

   Define behavioral objectives

Remember that the desired behavior outcome may not be the ideal behavior, but is a feasible, priority behavior that is effective.

**Example: Handwashing to mothers of children under five years old**

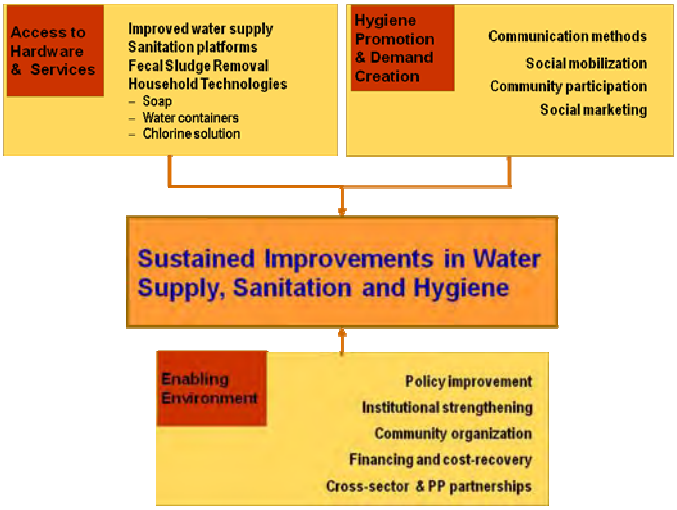


### WASH Improvement Framework

This framework outlines development interventions by using motivators and barriers. It reflects three essential elements necessary for improved WASH and diarrheal disease prevention.

- Hygiene promotion using diverse techniques
- Access to hardware – at both community and household levels
- Enabling environment

**Figure 12 - WASH Improvement Framework**




The key is that all partners – individuals, households, communities, NGOs, the private sector, governmental organizations at all levels, international organizations and donors – collectively address the various dimensions of the Framework.

### Comprehensive approach to behavior change

An effective behavior change strategy requires a good understanding of what people are already doing and why- and what's feasible to do. It also requires a multifaceted approach which is much more than communication and messages. Table 6, below, provides illustrative activities to consider in a comprehensive approach to achieving behavior change.

**Table 6 - Behavior change illustrative activities**

| Infrastructure | Product | Communications | Training | Mobilization | Policy | Finance |
|---|---|---|---|---|---|---|
| Provision of adequate safe water sources.<br><br>Provision of hand washing stations.<br><br>Availability of soap. | Soap<br><br>Hand washing stations<br><br>Soap making supplies | Demonstrations<br><br>Use of mass media<br><br>Educational games, theater, songs<br><br>Sports star advocate | NGO and public health agents:<br>• Key hygiene practices<br>• Strategies for BC communication<br>• How to conduct a community meeting<br><br>Community members:<br>• How and why to wash hands<br>• When to wash hands<br>• Include demonstration and practice | Contests for "clean hands, clean family"<br><br>Hygiene clubs<br><br>Creation and/or strengthening of water committees to advocate for infrastructure<br><br>Community engagement in decision making<br><br>Engage women AND men | Advocacy for Hand Washing (and WASH)<br><br>Include local government/ public health workers in design and implementation of interventions<br><br>Include hygiene education in curricula for primary and secondary schools, health care professional schools and health care staff in-service | Collection of community funds to build hand washing stations<br><br>Small grants<br><br>Voucher system for targeted subsidies<br><br>Public private partnership with soap manufacturer |

### Group Task

Individually, review the case study assigned to your group. After reading the case, as a group:

- Identify and list (on flipchart) what the initiative is doing that seems to be effective (best practices, factors that enhance sustainability) for promotion of improved hygiene practices.

- Discuss if this initiative might be possible in your Mission's situation. If not, provide one thing you might do differently and why.

**Image 3 - 'Sopo' the Malawian handwashing campaign character**

## NOTES

## USAID INSTITUTIONAL AND LEGAL FRAMEWORKS IMPACTING WASH: PART II

**Key messages:**

- The Foreign Assistance Framework, Operational Plans, and Standard Indicators are tools – not programming drivers.
- FACTS is USAID's comprehensive central data collection system that helps the Agency document funding and results in WASH to meet various reporting needs.
- FACTS is only one part of good WASH program Monitoring and Evaluation (M&E), and USAID is encouraging a move to more systemic monitoring of the sustainability of WASH services over time.

## Reporting on WASH

There are three main components for reporting and measuring performance for WASH in USAID.

1. Operational Plan (OP) / Performance Plan and Report (PPR) “Key Issue” Reporting
2. FACTS Indicators
3. Other WASH M&E

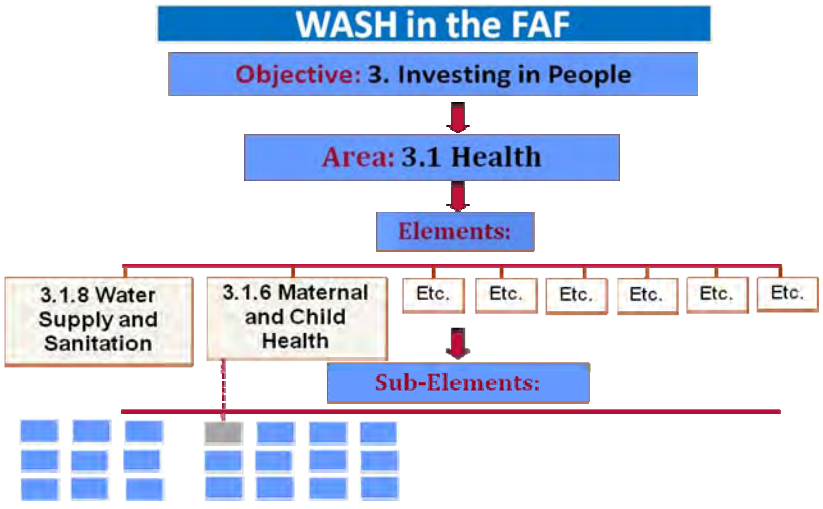
### Foreign Assistance Framework (FAF)

Before focusing on each reporting and measuring components individually, it is important to understand how the WASH sector corresponds with the overall Foreign Assistance Frameowrk (FAF) that is the platform through which we assign budgets and do reporting in the Agency.

You are not required to locate your funding for WASH activities (earmarked or not) in any one place in the FAF when doing your Operational Plans. WASH activities appear in many places within the FAF “Area”, “Element”, “Sub-Element” structure – in fact, Operating Units have included WASH activities in over 20 Elements and Sub-Elements in the last few years.

WASH does have a “dedicated” space in the FAF, however, located under the Health ”Area” within the “Investing in People” Objective (Figure 13). There are two Elements that contain specific references to WASH. The first is “Water Supply and Sanitation” (3.1.8), which is related to services. The other is “Maternal and Child Health” (3.1.6) and specifically sub-Element 3.1.6.8 that is linked to Hygiene behaviors.

**Figure 13 - WASH in the Foreign Assistance Framework (FAF)**



## Operational Plan (OP) and Performance Plan and Report (PPR) "Key Issue" Reporting

Besides the specific attribution of funding, implementation mechanisms, and results to the "Elements" of the Foreign Assistance Framework (FAF), there are several crosscutting topics that are called "Key Issues" that must also be addressed in the OP and Performance Plan and Report (PPR) processes.

In the case of water, linking funding and activities to a Key Issue assists the Agency in three ways.

- **Annual reporting requirements** associated with the Paul Simon Water for the Poor Act.
- **Annual tracking of obligations** under the Congressional water earmark.
- **Comprehensive historical documentation** of all USAID water funding in all subsectors and from all accounts (ongoing since 2000).

There isn't a single "Water" Key Issue, rather four distinct and mutually exclusive sub-Key Issues in the water sector.

1. Drinking Water Supply and Sanitation (earmark)
2. Watershed/Water Resources Management (earmark or non-earmark)
3. Water Productivity (earmark or non-earmark)
4. Disaster Preparedness (non-earmark)

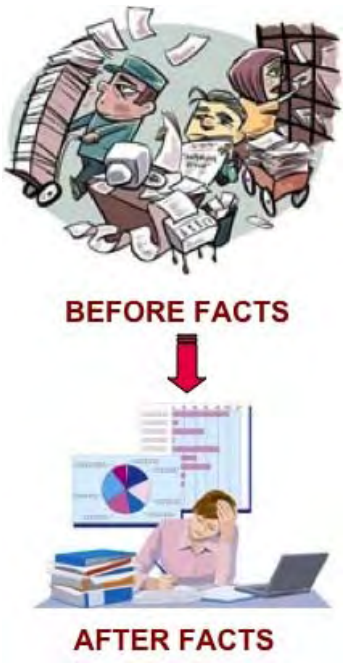
When reporting on these Key Issues users are asked to indicate whether or not the funding in each Sub-Key Issue area is intended to be attributed to the water earmark. Drinking Water Supply and Sanitation activities are always considered water earmark funding, Disaster Preparedness activities may never be attributed to the earmark, and Water Resources Management and Water Productivity activities may include both water earmark and non-water earmark resources.

IMPORTANT NOTE: It **does not** matter which Element or Sub-Element funding Key Issues are assigned to. Key Issues transcend the entire Foreign Assistance Framework and are meant to be a place where you can roll up activities linked to an issue across the entire Framework, regardless of where budget is assigned.

## FACTS = Foreign Assistance Coordinating and Tracking System

Historically indicators were developed and tracked separately by USAID and the State Department, causing a lack of consolidation to provide a comprehensive picture of foreign assistance activities and results. In response, the FACTS system was formalized as part of the Foreign Assistance Framework planning and budgeting structure, to provide:

- Central repository to facilitate country level planning, monitoring and data management
- Data collect for the OPs and Annual Performance Reports (PPRs)
- The system is designed to help the USG respond quickly and accurately to questions from Congress, the White House, the public and our many foreign assistance stakeholders.




FACT indicators include both output and outcome indicators. An output indicator measures immediate things the project produced, "e.g. number of people trained," while an outcome indicator measures the result of the program, e.g. "number of people with access to improved water supply."

In day to day programming, most indicators exist at the Element level in the FAF In the past, the only standard indicators that a program could report against had to link to the Element where funding was assigned. Since 2011, FACTS now permits Operating Units to report against indicators located anywhere within the FAF, regardless of where you have assigned your funding.

**Custom indicators**

Standard indicators may be complemented by "custom indicators" that are developed by each Operating Unit at the Implementing Mechanism level to measure and monitor performance in areas not captured by the existing standard indicators. "Custom" wash indicators may be useful for:

- program management oversight and guidance,
- more detailed progress reporting or
- getting "credit" for program results that are not reflected in the common indicators.

FACTS guidance indicates that Custom Indicators should only be added at the 'outcome' level --- **no custom 'output'** indicators will be accepted (e.g., number of people trained).

In practice, custom indicators are rarely used in FACT. They are quite useful for deeper program monitoring and evaluation, however. Developing a robust and detailed set of custom indicators specifically tailored to your program is definitely recommended as you develop your program PMPs or specific activity performance monitoring systems.

**FACTS and WASH Standard Indicators**

In the case of WASH standard indicators, the primary FACTS indicators are found linked to Element 3.1.8 and sub-Element 3.1.6.8. As mentioned above, you can report against these indicators regardless of where your WASH funding is located in the FAF. The standard WASH

indicators were revised and improved in 2011. The most important of these indicators are summarized in **Box 2**.

**Box 2 - Key FACTS WASH Standard Indicators**

IIP 3.1.8 Water Supply and Sanitation

- Number of people gaining access to an improved drinking water source (i.e., new access)
- Number of people receiving improved service quality from existing improved drinking water sources (i.e., existing access)
- Number of people gaining access to an improved sanitation facility
- Number of improved toilets provided in institutional settings
- Number of new policies, laws, agreements, regulations, or investment agreements (public or private) implemented that promote access to improved water supply and sanitation
- Percentage of children under age five who had diarrhea in the prior two weeks
- Percent of a drinking water utility's supply that is non-revenue

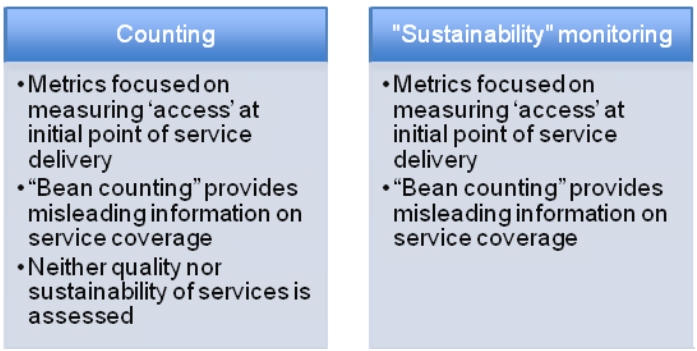
IIP 3.1.6.8 Household Water, Sanitation, Hygiene, and Environment

- Percent of households in target areas with soap and water at a handwashing station commonly used by family members
- Percent of households in target areas practicing correct use of recommended household water treatment technologies
- Number of liters of drinking water disinfected with point-of-use treatment products
- Number of villages in nationally certified "open defecation free" communities

WASH standard indicators attempt to cover a breadth of WASH activities and program dimensions, including water supply and sanitation services, access to services in household and institutional settings, first time MDG access and improvements in the quality of existing service, system hardware as well as software issues related to capacity, enabling environment, financing, and behavior change, etc.

### Definitions and guidelines

- "Indicator Sheets" provide detailed guidance on each standard indicator
- Definitions and measurement units are important, since different types of access or service are measured
- Ask for clarification from USAID technical offices in E3 and GH if you have questions on what to



count or how to count it.

## WASH Monitoring and evaluation (M&E) trends

Beyond FACTS the development of additional, customized indicators there is a movement within the WASH sector that is trying to reframe what and how results are monitored. A number of WASH benchmarking and monitoring systems are shifting the focus away from just one-time 'counting' of access directly after a system is constructed, to measuring factors associated with the ongoing, sustained delivery of services.

## Key messages

- The Foreign Assistance Framework, Operational Plans, and Standard Indicators are tools – not programming drivers.
- FACTS is USAID's comprehensive central data collection that helps the Agency document funding and results in WASH to meet various reporting needs.
- FACTS is only one part of good WASH program Monitoring and Evaluation (M&E), and USAID is encouraging a move to more systemic monitoring of the sustainability of WASH services over time.

## Table task – WASH monitoring and evaluation

**USAID would like to move towards an increased focus on measuring sustainability of WASH services.**

At your tables, discuss the following questions and be prepared to share with the group.

What are two challenges USAID Missions face in measuring water supply or sanitation service sustainability?

What can USAID do to address these challenges and improve the monitoring of WASH service sustainability in its programs?

What do Missions need to overcome challenges and help mainstream service sustainability monitoring into WASH programs?

## NOTES

## USAID INSTITUTIONAL AND LEGAL FRAMEWORKS IMPACTING WASH: PART III

**Key message:**

- All USAID-financed WASH activities require an environmental review and approval prior to obligation of funds.

## USAID Environmental Compliance

USAID's environmental compliance rules were put in place during the same era as other major environmental protection legislation in the US in the 1970s. The institution of environmental compliance rules was initially precipitated by a lawsuit linked to pesticide exposure in Pakistan. USAID settled out of court, but developed NEPA compliance "Environmental Procedures" through 22 CFR 216 (Title 22, Code of Federal Regulations, part 216)

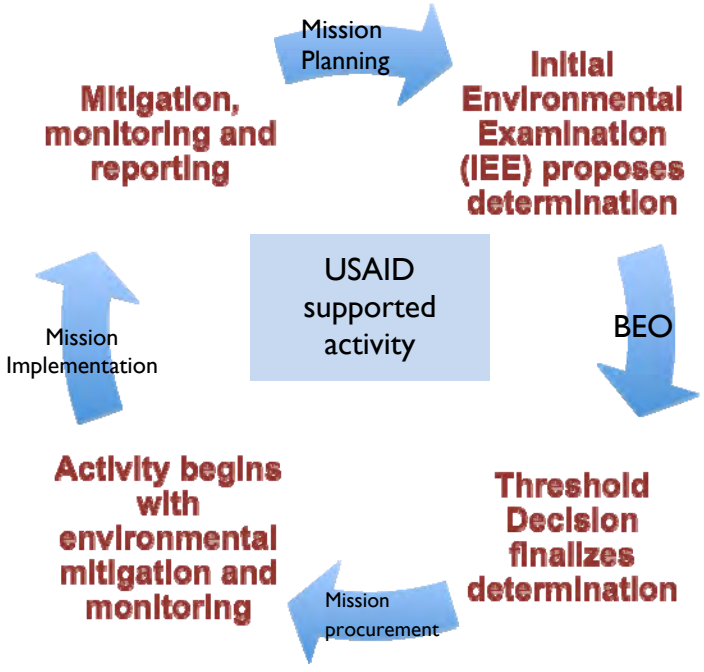
22 CFR 216 established a system of Bureau Environmental Officers to approve environmental compliance decisions and an Agency Environmental Coordinator – a system that continues to this day.

**Who, what, when and how?**

USAID's environmental compliance regulations come into play throughout the program cycle.

1. Starting with Mission planning, and passing through the determination phase where an Initial Environmental Examination (IEE) or a Request for Categorical proposes a "Determination" for an activity.
2. The Bureau Environmental Officer (BEO) then issues a "Threshold Decision" formally approving the proposed "Determination."
3. The activity begins after procurement/obligation with an Environmental Mitigation and Monitoring Plan, which "will avoid a significant effect on the environment" and describe the "means to mitigate adverse environmental impacts."
4. Mitigation, monitoring and reporting continue through the implementation and life of the activity.

**Figure 14 - USAID Regulation 216 and Program Cycle**



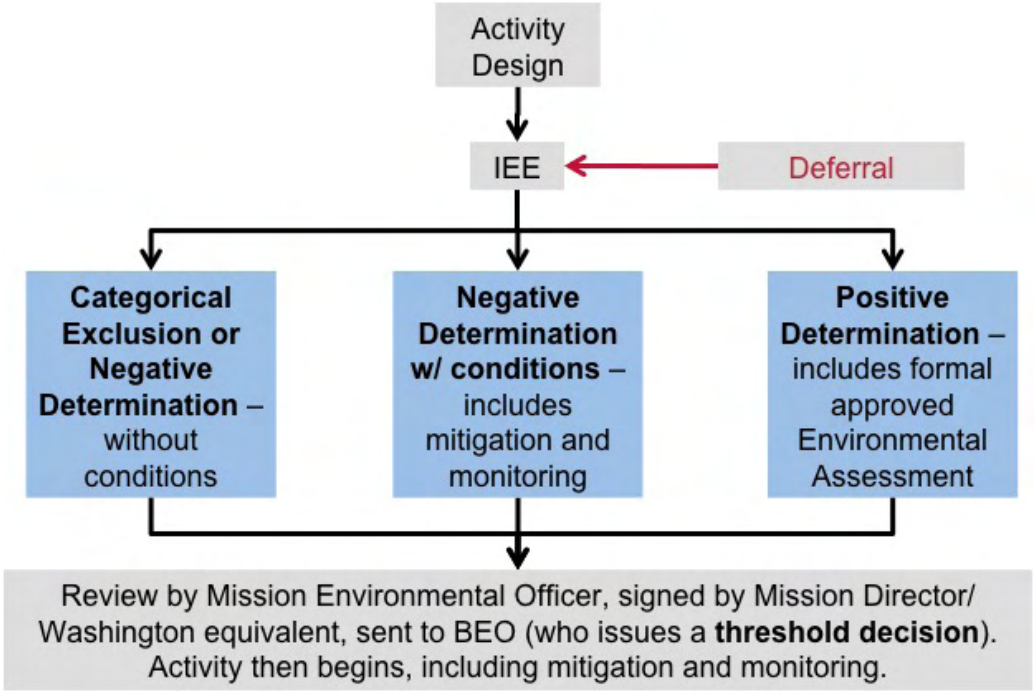
**Requirements**

IEEs and Requests for Categorical Exclusion apply to:

- All new or supplemental activities funded by USAID
- Changes in existing activities which imply:
    - New components
    - A significant expansion or additional financing
    - Costs not previously included
    - Environmental impacts not previously foreseen

This flow chart highlights three possible IEE "Determinations" for USAID activities. During activity design an IEE can recommend one or more determinations for specific program components. USAID WASH programs almost always receive a "Negative Determination with Conditions" Determination (with larger-scale infrastructure triggering a "Positive Determination"):

**Figure 15 - Regulation 216 determination process**




**Environmental mitigation**

Typical types of environmental impact and required mitigation associated with smaller scale WASH programs include the following:

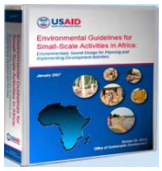
- Proper sitting of sanitation systems to prevent contamination of water sources or public health hazard.

- Required water quality testing to certify new water points – including arsenic!!
- Testing of water yields/quantity to ensure that water is not being overdrawn for new water systems.
- Careful site management to prevent pollution or destruction of habitat.

**Reg. 216 Resources for WASH**

USAID has developed some excellent resources to help you write your IEE's for small-scale WASH programs. Africa Bureau has taken the lead on developing guidance, but these resources are useful for programs around the world.


Africa Bureau's Environmental Capacity Building resources: http://www.encapafrica.org/index.htm




Environmental Guidelines for Small-Scale Activities in Africa (Chapter 16: WASH)

**Remember - All USAID-financed WASH activities require an environmental review and approval prior to obligation of funds!**

**WHERE CAN YOU TURN FOR HELP?**

There are regional environmental advisors (REAs) in most regions and mission environmental officers (MEOs) within every field mission.

For information, visit:

**http://www.usaid.gov/our_work/environment/compliance/officers.html#rea**

## NOTES

## NOTES

## Daily Resources

**Hygiene**

- BioSand Filtration
- Boiling
- Ceramic Filtration
- Flocculent / disinfectant powder
- Solar Disinfection (SODIS)
- Safe storage of drinking water
- Household Chlorination

**Reporting on WASH**

- Foreign Assistance Framework

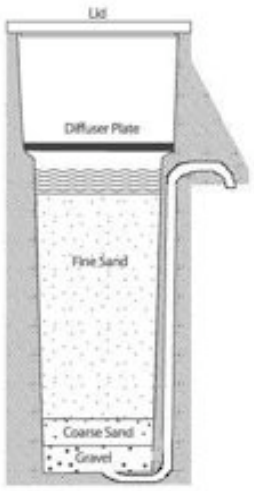
# Household Water Treatment Options in Developing Countries: BioSand Filtration

June 2008

Household water treatment and safe storage (HWTS) interventions are proven to improve water quality and reduce diarrheal disease incidence in developing countries. Four of these HWTS options – chlorination, solar disinfection, ceramic filtration, and flocculation/disinfection – are proven to improve microbiological quality and reduce diarrheal disease in developing countries. Other options – including BioSand Filters – are widely implemented but are not yet specifically proven to reduce diarrheal disease incidence in peer-reviewed research. Organizations wanting to develop HWTS programs are often faced with the difficult decision of selecting which option or options are appropriate for their particular circumstances, and how to choose between proven and unproven options. The most appropriate HWTS option for a location depends on existing water and sanitation conditions, water quality, cultural acceptability, implementation feasibility, availability of HWTS technologies, and other local conditions. This series of fact sheets is designed to assist organizations in comparing, and ultimately selecting, the appropriate HWTS option or options. For more information on household water treatment, please visit www.who.int/household_water. For more information on BioSand Filtration, please visit www.cawst.org or www.bushproof.org.

## BioSand Filtration

The BioSand Filter (BSF) is a slow-sand filter adapted for use in the home. The version of the BSF most widely implemented consists of layers of sand and gravel in a concrete or plastic container approximately 0.9 meters tall, and 0.3 meters square. The water level is maintained to 5-6 cm above the sand layer by setting the height of the outlet pipe. This shallow water layer allows a bioactive layer to grow on top of the sand, which contributes to the reduction of disease-causing organisms. A diffuser plate with holes in it is placed on the top of the sand layer to prevent disruption of the biolayer when water is added to the system. To use the BSF, users simply pour water into the BSF, and collect finished water out of the outlet pipe into a bucket.




*BioSand Filter Schematic (CAWST, www.cawst.org)*

## Lab Effectiveness, Field Effectiveness, and Health Impact

In laboratory and field testing, the BSF consistently reduces bacteria by 81-100% and protozoa by 99.98-100%. Initial research has shown that the BSF removes less than 90% of indicator viruses. Although the data has not yet been published, initial data from the first diarrheal disease impact study on the BSF, conducted by the University of North Carolina, documented an estimated 40% reduction in diarrheal disease in users of the BSF. Three more health impact studies, in Ghana, Cambodia, and Honduras, are currently being planned.

## Benefits, Drawbacks, and Appropriateness

The benefits of BioSand Filtration are:

- Proven removal of protozoa and the majority of bacteria;
- Acceptability to users because of high flow rate, ease-of-use, and visual improvement in the water;
- Production from locally available materials;
- One-time installation with low maintenance requirements; and,
- Long life.

The drawbacks of BioSand Filtration are:

- Low inactivation of viruses;
- Absence of post-filtration residual protection so that if water is filtered into an open or unclean bucket there is potential for contamination;
- The current lack of studies to prove health impact; and,
- The difficulty in transporting a 100-350 pound item and the high initial cost that make scalability more challenging.

BioSand Filtration is most appropriate in areas where there is external funding to subsidize the initial cost of the filter, education for users, locally-available sand, and a transportation network capable of moving the buckets and sand.

*The locally-made Pure Water for the World concrete BSF design (Pure Water for the World)*

*The locally-made Pure Water for the World plastic BSF design (Pure Water for the World)*

## Implementation Examples

The BSF has been implemented using a variety of different strategies, including:

- Initially, the BSF was designed by Dr. David Manz and his students at the University of Calgary. The plastic container version of the BSF was patented, and sold by the company Davnor. The concrete container version was open-sourced, and used by non-governmental organizations (NGOs).
- The NGO Samaritan's Purse has been and remains one of the principal implementers of the concrete BSF, responsible for installing about 30,000 filters, including 15,000 in Cambodia. Samaritan's Purse works with local partners in Cambodia who hold informational meetings for potential BSF users. Attendees interested in receiving a BSF are invited to a second training meeting, where they sign up to receive a BSF, are asked to contribute a small amount to their ownership of the BSF (about $3), attend focus group trainings on use of the BSF and hygiene, and send one family member to assist with the construction and transportation of the BSF. Samaritan's Purse has developed an implementation manual and has technical support staff to assist BSF projects across the world.
- Recently, Dr. Manz has licensed the plastic version of the BSF to the non-governmental organization (NGO) International Aid. International Aid manufactures the plastic containers in Michigan and Honduras, and works with local implementing organizations to import the plastic containers, create the sand filter, and educate users. Pure Water for the World (PWW) is another NGO working with a different plastic container model, made locally using rotational molding in Haiti and Honduras. PWW works with local implementing organizations as well.
- The non-governmental organizations (NGOs) Centre for Affordable Water and Santitation (CAWST) and BushProof both offer training on concrete BioSand Filter construction, and implementation manuals and assistance, to NGOs interested in starting BSF programs.

For more information on BioSand Filter programs, please contact www.davnor.com, www.purewaterfortheworld.com, www.internationalaid.com, www.cawst.org, www.bushproof.org, or www.biosandfilter.org.

## Economics and Scalability

The main cost of the BSF is for the initial materials (container, sand, gravel) and the transportation of those materials to the users' homes. To date, almost all BSF programs are dependent on external donor funds to subsidize the initial cost of the filter. The initial cost of the filter varies by program, with the International Aid filter installed at a cost of $32 for the container and $18 for transportation and education, for a total of $50. The full cost of installation and education of the Samaritan's Purse concrete version is $67. Some NGOs have worked to train local craftspeople to manufacturer, promote, and sell the BSF within their communities, although this has met with limited success due to the expense of the filters and the difficulty in identifying a local entrepreneur who can both manufacturer and promote the BSF.


*The International Aid BSF Filter Design (www.internationalaid.org)*

# Household Water Treatment Options in Developing Countries: Boiling

January 2009

Household water treatment and safe storage (HWTS) interventions are proven to improve water quality and reduce diarrheal disease incidence in developing countries. Five of these HWTS options – chlorination, solar disinfection, ceramic filtration, sand filtration, and flocculation/disinfection – are proven to improve microbiological quality and prevent diarrheal disease in developing countries. Other options – including boiling – are widely implemented but currently lack peer-reviewed research that specifically proves the process reduces diarrheal disease. Research is ongoing to document the health impacts of boiling. Organizations that want to develop HWTS programs are often faced with the difficult decision of selecting which option or options are appropriate for their particular circumstances, and how to choose between proven and unproven options. The most appropriate HWTS option for a location depends on existing water and sanitation conditions, water quality, cultural acceptability, implementation feasibility, availability of HWTS technologies, and other local conditions. This series of fact sheets is designed to assist organizations in comparing, and ultimately selecting, the appropriate HWTS option or options. For more information on household water treatment, please visit www.who.int/household_water.

## Boiling

Boiling is arguably the oldest and most commonly practiced household water treatment method, and it has been widely promoted for decades. Organizations recommend boiling both for water treatment in developing countries and to provide safe drinking water in emergency situations throughout the world. Although boiling time recommendations vary significantly, from 0-20 minutes, to make water safe for consumption the water simply must reach the boiling point of 100 C / 212 F. The World Health Organization thus recommends that water be heated until it reaches the boiling point. Some organizations, such as the CDC, recommend a rolling boil of 1 minute, in order to ensure that users do not stop heating the water before the true boiling point is reached. Both recommendations are accurate, although boiling water longer than a few seconds is not necessary to inactivate the pathogens that cause diarrheal disease. Water should be stored in the same container in which it was boiled, handled carefully, and consumed within 24 hours to prevent recontamination.

*Storage of boiled water in a Burmese refugee camp (CDC, D. Lantagne)*

## Lab Effectiveness, Field Effectiveness, and Health Impact

If the boiling point is reached, boiling is effective at inactivating all the bacteria, viruses, and protozoa that cause diarrheal disease. However, studies in developing countries have documented incomplete inactivation of bacteria in boiled water. This disparity between the laboratory and field results is attributed to users not heating the water to the boiling point and/or recontamination of boiled water in storage. To date, there have been no peer-reviewed studies assessing the health impact associated with boiling water, although some case-control studies in cholera outbreaks have noted boiling as being protective against cholera.

## Benefits, Drawbacks, and Appropriateness

The benefits of boiling are:

- Existing presence in many households of materials needed to boil;
- Proven inactivation of all bacteria, viruses and protozoa, even in turbid or contaminated water; and,
- Socio-cultural acceptance of boiling for water treatment, particularly in tea-consuming cultures.

The drawbacks of boiling are:

- Lack of residual protection against contamination;
- Lack of epidemiologically confirmed health impact;
- Potential for burn injuries and increased risk of respiratory infections from indoor stoves or fires;
- Potentially high cost of carbon-based fuel source (with concurrent deforestation risk) and the opportunity cost of collecting fuel;
- Potential user taste objections; and,
- Potential for incomplete water treatment if users do not bring water to full boiling temperature.

Boiling is most appropriate in areas with a good fuel supply, a cultural tradition of boiling, and where water is stored safely after boiling.

# Household Water Treatment Options in Developing Countries: Ceramic Filtration

January 2008

Household water treatment and safe storage (HWTS) interventions are proven to improve water quality and reduce diarrheal disease incidence in developing countries. Four of these proven HWTS options – chlorination, solar disinfection, ceramic filtration, and flocculation/disinfection – are widely implemented in developing countries. Organizations wanting to develop HWTS programs are often faced with the difficult decision of selecting which option or options are appropriate for their particular circumstances. The most appropriate HWTS option for a location depends on existing water and sanitation conditions, water quality, cultural acceptability, implementation feasibility, availability of HWTS technologies, and other local conditions. This series of fact sheets is designed to assist organizations in comparing, and ultimately selecting, the appropriate proven HWTS option or options. For more information on household water treatment, please visit www.who.int/household_water. For more information on ceramic filtration programs in developing countries, please visit www.pottersforpeace.org.

## Ceramic Filtration

Locally manufactured ceramic filters have traditionally been used throughout the world to treat household water. Currently, the most widely implemented HWTS ceramic filter is the Potters for Peace design, which is flowerpot shaped, holds about 8-10 liters of water, and sits inside a plastic or ceramic receptacle. The filters are produced locally at ceramics facilities, and then impregnated with colloidal silver to ensure complete removal of bacteria in treated water and to prevent growth of bacteria within the filter itself. Numerous other locally-made and commercial HWTS ceramic filters are widely available in developed and developing countries.

Most ceramic filter HWTS systems are based on a filter/receptacle model. To use the ceramic filters, families fill the top receptacle or the ceramic filter itself with water, which flows through the ceramic filter or filters into a storage receptacle. The treated water is then accessed via a spigot embedded within the water storage receptacle.

*The Potters for Peace filter, locally produced in Nicaragua (CDC / D. Lantagne)*

## Lab Effectiveness, Field Effectiveness, and Health Impact

The effectiveness of ceramic filters at removing bacteria, viruses, and protozoa depends on the production quality of the ceramic filter. Most ceramic filters are effective at removing most of the larger protozoal and bacterial organisms, but not at removing the smaller viral organisms. Studies have shown removal of bacterial pathogens in water filtered through high quality locally-produced and imported ceramic filters in developing countries. A 60-70% reduction in diarrheal disease incidence has been documented in users of these filters. Studies have also shown significant bacterial contamination when poor-quality locally produced filters are used, or the receptacle is contaminated at the household level. Because of the lack of residual protection, it is important that users be trained to properly care for and maintain the ceramic filter and receptacle.

## Benefits, Drawbacks, and Appropriateness

The benefits of ceramic filtration are:

- Proven reduction of bacteria and protozoa in water;
- Acceptability to users because of the simplicity of use;
- Proven reduction of diarrheal disease incidence in users;
- Long life if the filter remains unbroken; and,
- A low one-time cost;

The drawbacks of ceramic filtration are:

- Lower effectiveness against viruses;
- Lack of residual protection can lead to recontamination if treated water is stored unsafely;
- Variability in quality control of locally produced filters;
- Filter breakage over time, and need for spare parts;
- Filters and receptacles need to be regularly cleanes, especially when using turbid source waters; and,
- A low flow rate of 1-3 liters per hour in non-turbid waters.

Ceramic filtration is most appropriate in areas where there is capacity for quality ceramics filter production, a distribution network for replacement of broken parts, and user training on how to correctly maintain and use the filter.

*A family using a PFP ceramic filter in a ceramic receptacle (CDC, D. Lantagne)*

*Example of a commercially available ceramic candle filter system (replacement cartridge and container) (http://www.stefani.com.au)*

## Implementation Examples

Ceramic filtration programs have been implemented in over 20 countries using a variety of strategies, including:

- Potters for Peace (PFP) is a United States and Nicaraguan-based non-governmental organization (NGO) that promotes the flower-pot ceramic filter design by providing technical assistance to organizations interested in establishing a filter factory. PFP has assisted in establishing filter-making factories in 17 countries. Once the filter factory is established, the factory markets the filters to NGOs who then incorporate the filter into their own water and sanitation programming. www.pottersforpeace.org
- The first PFP filter factory, in Managua, Nicaragua, was constructed using private donations. From 1999-2005, the filter factory was a self-financed recognized micro-enterprise in Nicaragua. NGOs paid $10 per filter, and transported the filters themselves to project locations. Despite the fact that 23,000 filters were made and sold in Nicaragua from 1999-2004, the factory was not financially sustainable and was sold in 2005 to a private investor who increased the price of each filter to $17.
- One of the largest ceramic filtration programs is in Cambodia, where two NGOs both worked with PFP to establish filter factories. RDI distributes the filters through unsubsidized direct sales, distribution through local vendors, and community-based subsidized programs. IDE distributes the filters nationally through vendors. Both NGOs sell filters to government agencies and other NGOs. The project has successfully distributed over 200,000 filters and has been extensively studied. Study results can be found at http://www.wsp.org/filez/pubs/926200724252_eap_cambodia_filter.pdf.

## Economics and Scalability

Locally manufactured ceramic PFP-design filters range in cost from $7.50-$30. Distribution, education, and community motivation can add significantly to program costs. Ceramic filter programs can achieve full cost recovery (charging the user the full cost of product, marketing, distribution, and education), partial cost recovery (charging the user only for the filter, and subsidizing program costs with donor funds), or be fully subsidized such as in emergency situations. If a family filters 20 liters of water per day (running the filter continuously) and the filter lasts 3 years then the cost per liter treated (including cost of filter only) is 0.034-0.14 US cents.

Commercially available ceramic filter systems range in cost from tens to hundreds of US dollars, depending on where they are manufactured and purchased, and the quality of the ceramic filters. The economics and the sustainability of commercial product-based projects depend on donor funding and subsidy, as well as follow-up to ensure replacement parts are accessible to the population using the filters.

*Placing the ceramic pot into the receptacle (PFP, Ron Rivera)*

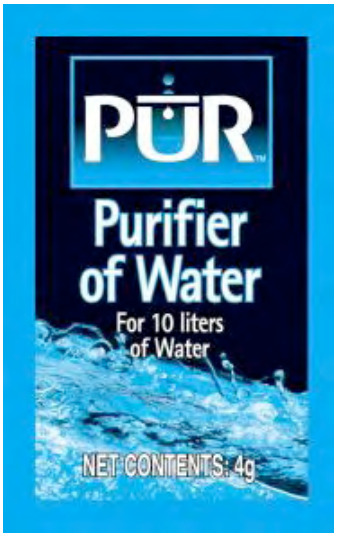
# Household Water Treatment Options in Developing Countries: Flocculant/Disinfectant Powder January 2008

Household water treatment and safe storage (HWTS) interventions are proven to improve water quality and reduce diarrheal disease incidence in developing countries. Four of these proven HWTS options – chlorination, solar disinfection, ceramic filtration, and flocculation/disinfection – are widely implemented in developing countries. Organizations wanting to develop HWTS programs are often faced with the difficult decision of selecting which option or options are appropriate for their particular circumstances. The most appropriate HWTS option for a location depends on existing water and sanitation conditions, water quality, cultural acceptability, implementation feasibility, availability of HWTS technologies, and other local conditions. This series of fact sheets is designed to assist organizations in comparing, and ultimately selecting, the appropriate proven HWTS option or options. For more information on household water treatment, please visit www.who.int/household_water. For more information on the flocculant/disinfectant powder PUR Purifier of Water™, please visit www.csdw.org/index.shtml or www.pghsi.com/safewater.

## Flocculant/Disinfectant Powder

The Procter & Gamble Company (P&G) developed PUR Purifier of Water™ in conjunction with the Centers for Disease Control and Prevention. PUR sachets are now centrally produced in Pakistan, and sold to NGOs worldwide at a cost of 3.5 US cents per sachet. The PUR product is a small sachet containing powdered ferric sulfate (a flocculant) and calcium hypochlorite (a disinfectant). PUR was designed to reverse-engineer a water treatment plant, incorporating the multiple barrier processes of removal of particles and disinfection.

To treat water with PUR, users open the sachet, add the contents to an open bucket containing 10 liters of water, stir for 5 minutes, let the solids settle to the bottom of the bucket, strain the water through a cotton cloth into a second container, and wait 20 minutes for the hypochlorite to inactivate the microorganisms.




*A PUR sachet*

## Lab Effectiveness, Field Effectiveness, and Health Impact

The flocculant/disinfectant powder PUR has been proven to remove the vast majority of bacteria, viruses, and protozoa, even in highly turbid waters. PUR has also been documented to reduce diarrheal disease from 16 to greater than 90% incidence in five randomized, controlled health intervention studies. In addition, PUR removes heavy metals, such as arsenic, and chemical contaminants, such as some pesticides, from water. Studies showing the efficacy of PUR have been conducted in the laboratory and in developing countries, in rural and urban areas and refugee camps, and include adults and children that are poor and/or using highly turbid water.

## Benefits, Drawbacks, and Appropriateness

The benefits of flocculant/disinfectant powders are:

- Proven reduction of bacteria, viruses, and protozoa in water;
- Removal of heavy metals and pesticides;
- Residual protection against contamination;
- Proven health impact;
- Acceptable to users because of visual improvement in the water; and
- Sachets are easily transported due to their small size, long shelf life, and classification as non-hazardous material for air shipment.

The drawbacks of flocculant/disinfectant powders are:

- Multiple steps are necessary to use the product, which requires a demonstration to teach new users;
- The need for users to have, employ, and maintain two buckets, a cloth, and a stirring device; and,
- The higher relative cost per liter of water treated compared to other household water treatment options.

PUR is most appropriate in areas with a consistent supply chain for sachet resupply, and in urban, rural, and emergency situations where educational messages can reach users to encourage correct and consistent use.

*Selling PUR sachets in Haiti*
*(CDC, D. Lantagne)*

*Drinking water treated with PUR*
*(P&G, G. Allgood)*

## Implementation Examples

85 million sachets of PUR, treating 850 million liters of water, have been distributed in emergency response or sold through social marketing projects in 2003-2007. PUR has been made available in 23 countries with numerous partners using a variety of strategies, including:

- Social marketing organizations, such as the NGO Population Services International (PSI), sell PUR sachets in 9 countries.
- Local organizations use the socially marketed PUR sachets in their own programming to provide safe drinking water. For example, in western Kenya students in schools are taught how and why to use PUR, and safe water clubs treat drinking water for all the students. Also in Kenya, HIV self-help groups sell PUR sachets and storage containers as an income generating activity.
- PUR sachets have been widely used to respond to emergencies – from the 2004 tsunami in Indonesia to flooding in Haiti to cholera epidemics in Africa.
- The Procter & Gamble Children's Safe Drinking Water program has been given numerous awards, including the Ron Brown Presidential Award for Corporate Leadership in 2007, the EPA Children's Health Excellence Award in 2007, the Grainger Challenge Bronze Award in 2007, and the Stockholm Industry Water Award in 2005.

For more information on PUR programs, please visit www.csdw.org/index.shtml or www.pghsi.com/safewater.

## Economics and Scalability

Each sachet of PUR is provided to global emergency relief organizations or non-governmental organizations at a cost of $0.035 (3.5 US cents), not inclusive of shipping from Pakistan by ocean container. Transport, distribution, education, and community motivation can add significantly to program costs. Sachets are generally sold at product cost recovery for 10 US cents each, for a cost of 1 US cent per liter treated. Currently, PUR projects operate either on partial cost recovery (charging the user only for the product, and subsidizing program costs with donor funds), or fully subsidized free distribution such as in emergency situations. Procter & Gamble sells the PUR sachets at cost, makes no profits on PUR sales, and donates programmatic funding to some projects.


*Turbid water in Kenya treated with PUR*
*(P&G, G. Allgood)*

# Household Water Treatment Options in Developing Countries: Solar Disinfection (SODIS) January 2008

Household water treatment and safe storage (HWTS) interventions are proven to improve water quality and reduce diarrheal disease incidence in developing countries. Four of these proven HWTS options – chlorination, solar disinfection, ceramic filtration, and flocculation/disinfection – are widely implemented in developing countries. Organizations wanting to develop HWTS programs are often faced with the difficult decision of selecting which option or options are appropriate for their particular circumstances. The most appropriate HWTS option for a location depends on existing water and sanitation conditions, water quality, cultural acceptability, implementation feasibility, availability of HWTS technologies, and other local conditions. This series of fact sheets is designed to assist organizations in comparing, and ultimately selecting, the appropriate proven HWTS option or options. For more information on household water treatment, please visit www.who.int/household_water. For more information on solar disinfection programs in developing countries, please visit www.sodis.ch or www.fundacionsodis.org.

## Solar Disinfection

Solar disinfection (SODIS) was developed in the 1980's to inexpensively disinfect water used for oral rehydration solutions used to treat diarrhea. In 1991, the Swiss Federal Institute for Environmental Science and Technology (SANDEC, EAWAG) began to investigate and implement SODIS as an HWTS option, to prevent diarrhea in developing countries.

Users of SODIS fill 0.3-2.0 liter plastic soda bottles with low-turbidity water, shake them to oxygenate, and place the bottles on a roof or rack for 6 hours (if sunny) or 2 days (if cloudy). The combined effects of UV-induced DNA alteration, thermal inactivation, and photo-oxidative destruction inactivate disease-causing organisms.

*A woman using SODIS (SANDEC, EAWAG)*

## Lab Effectiveness, Field Effectiveness, and Health Impact

In the laboratory, SODIS has been proven to inactivate the viruses, bacteria, and protozoa that cause diarrheal diseases. Field data have also shown reductions of bacteria in water from developing countries treated with SODIS.

In four randomized, controlled trials, SODIS has resulted in reductions in diarrheal disease incidence ranging from 9-86%.

## Benefits, Drawbacks, and Appropriateness

The benefits of SODIS are:

- Proven reduction of viruses, bacteria, and protozoa in water;
- Proven reduction of diarrheal disease incidence in users;
- Acceptability to users because of the simplicity of use;
- No cost to the user after obtaining the plastic bottles;
- Minimal change in taste of the water; and,
- Although SODIS does not have a chemical residual, recontamination is unlikely because water is served directly from the small, narrow-necked bottles with caps in which it is treated.

The drawbacks of SODIS are:

- The need for pretreatment (filtration or flocculation) of waters of higher turbidity;
- User acceptability concerns because of the limited volume of water that can be treated at once and the length of time required to treat water; and,
- The large supply of intact, clean, suitable plastic bottles required.

SODIS is most appropriate in areas where there is availability of bottles and community motivation and training for users on how to correctly and consistently use SODIS for treating household drinking water.

*Using SODIS on rooftops (SANDEC, EAWAG)*

## Implementation Examples

Over 2 million people in 28 developing countries use SODIS for daily drinking water treatment. Experience has shown that SODIS is best promoted and disseminated by partner institutions based in the project area. Important partners are community-based organizations (CBOs) such as women's clubs, youth associations or self-help groups, well-established NGOs working on community development projects, institutional organizations such as health posts, hospitals, and teacher training centers, and government programs. Individuals, such as community and religious leaders as well as politicians and decision-makers, play a key role and should be involved from the beginning of a project. SODIS promotion in a new area begins with a pilot project of one year that reaches 2000-4000 families. In the second year, the project expands into the field of advocacy to scale-up the project. Examples of SODIS projects include:

- The CBO KWAHO promotes SODIS in the Kibera slums of Nairobi, Kenya. Over 250,000 people are reached by trained promoters using social marketing to disseminate knowledge about SODIS. Research-based information is given out by promoters to potential users, especially when users are skeptical about SODIS.
- In Latin America the promotion is channeled through a regional reference center, Fundaçion Sodis. The Fundaçion's strategy is to build and strengthen a network of partner institutions. The Fundaçion does not implement projects, but focuses on training trainers, technical assistance, and lobbying activities. More than 100,000 people are using SODIS in Latin America.
- In Assam, India, Assam University provided technical and training support for a SODIS promotion project with a local NGO. The dissemination phase targeted 20,000 households based on lessons learned during the pilot phase. An approach involving active participation of institutions such as village councils, schools, and health centers was adopted to ensure the project is community-owned and sustainable.

## Economics and Scalability

SODIS as a virtually zero-cost technology faces marketing constraints. Since 2001, local NGOs in 28 countries have disseminated SODIS through training of trainers, educating at the grassroots level, providing technical assistance to partner organizations, lobbying key players, and establishing information networks.

The experiences gained have shown that SODIS is best promoted and disseminated by local institutions with experience in community health education. A long-term training approach and repeated contact with the community is needed to create awareness on the importance of treating drinking water and to establish corresponding changes in behavior. Both SANDEC/EAWAG and the SODIS Foundation provide technical assistance to NGOs implementing SODIS.

*SODIS users (SANDEC, EAWAG)*

# Preventing Diarrheal Disease in Developing Countries: Safe Storage of Drinking Water

January 2009

The health consequences of inadequate water and sanitation services include an estimated 4 billion cases of diarrhea and 1.9 million deaths each year, mostly among young children in developing countries. Diarrheal diseases lead to decreased food intake and nutrient absorption, malnutrition, reduced resistance to infection, and impaired physical growth and cognitive development. Since 1996, a large body of published work has proven the effectiveness of interventions to improve water quality through household water treatment and safe storage (HWTS) in reducing diarrheal disease. It is preferable, especially when using treatment options that do not leave residual protection, to store treated water in plastic, ceramic, or metal containers with the following characteristics, which serve as physical barriers to recontamination:

- A small opening with a lid or cover that discourages users from placing potentially contaminated items such as hands, cups, or ladles into the stored water;
- A spigot or small opening to allow easy and safe access to the water without requiring the insertion of hands or objects into the container; and,
- A size appropriate for the household water treatment method, with permanently attached instructions for using the treatment method and for cleaning the container.

If containers with these characteristics are not available, efforts should be made to educate household water treatment users to access the water by pouring from the containers rather than dipping into it with a possibly contaminated object. Evidence also suggests that safe storage containers (in the absence of household water treatment) are effective at preventing contamination of potable water during transport and storage.

Safe storage options fall into three general categories: 1) existing water storage containers in the home; 2) water storage containers used in the community and modified by an intervention program; or, 3) commercial safe storage containers purchased by the program and distributed to users. To determine the appropriate safe storage container for a program, first identify containers currently used for water collection, transport, and storage in the community, as these existing containers might already be safe, or could easily be modified to be safe storage containers. Programs are also encouraged to review the options for safe water storage containers presented herein to determine which ones may be most appropriate. For more information, contact safewater@cdc.gov. Care should be taken to avoid using any container previously used for transport of toxic materials (such as pesticides or petroleum products) as a drinking water storage container. Lastly, locally-appropriate cleaning mechanisms – such as use of soap and brushes, or chlorine solution, or an abrasive – should be developed and recommended to clean the container on a regular basis.

## The Oxfam Bucket

The 14-liter Oxfam Bucket was designed to provide a safe storage option to organizations working on water safety in the home or refugee camps. It is manufactured in England, and sold unassembled to NGOs for use in program implementation. The lids snap on to prevent entry of the hands or objects into the container. The Oxfam Bucket costs about US$4, excluding transport from England to the program site. A minimum order of 200 is required. Contact fieldlog@oxfam.org.uk to order.

*The Oxfam Bucket (Oxfam)*


*The CDC Container (CDC)*

## The CDC Container

In the initial Safe Water System programs, CDC designed 20-liter modified jerry cans and provided them to users. This jerry can is now produced in Uganda, Afghanistan, Kenya, and the United States. Each jerry can costs approximately $5, excluding transport. Contact safewater@cdc.gov.


*A woman carrying a jerry can in Mozambique; A jerry can; (CDC, D. Lantagne)*

## Jerry Cans

In many countries in Africa, 20-liter jerry cans, initially used to transport vegetable cooking oils, are cleaned and used to transport and store water. They are easy to carry on the head and are a good option for safe storage. The opening is too small to allow hands or utensils into the water, and thus the water is poured out. They can be modified by drilling a hole in the plastic and adding a tap, which offers easier access to the treated water and provides a handwashing station in the home. Used jerry cans cost approximately $1-5 on the open market in Africa.

## Bucket with Lid and Tap

Five gallon (19-liter) buckets are widely available in many countries and are often used for water transport and storage. Buckets can be modified for safe storage by ensuring there is a tight-fitting lid, drilling a hole through the plastic and installing a sturdy tap, placing a label with instructions for water treatment on the bucket, and teaching people to use the tap instead of dipping into the bucket. In Haiti, this is an easy educational message, since the tap is seen as a sign of higher socio-economic status, and families take pride in using it. Taps and labels can be imported or locally made.


*Modified Bucket in Haiti (Emory, M. Ritter)*

## Modified Clay Pots

In many cultures, clay pots are the preferred storage container, because as water evaporates through the clay the water inside the container is cooled. In some rural areas, water is transported in clay pots, but in most areas water is transported in plastic containers and then stored in clay pots. By working with local potters, it is possible to modify clay pots to have a tap, as seen in the two examples. Contact safewater@cdc.gov for technical assistance on manufacturing the pots.

*Modified Clay Pots in Kenya and Nicaragua (CDC, R. Quick and D. Lantagne)*

# Household Water Treatment Options in Developing Countries: Household Chlorination January 2008

Household water treatment and safe storage (HWTS) interventions are proven to improve water quality and reduce diarrheal disease incidence in developing countries. Four of these proven HWTS options – chlorination, solar disinfection, ceramic filtration, and flocculation/disinfection – are widely implemented in developing countries. Organizations wanting to develop HWTS programs are often faced with the difficult decision of selecting which option or options are appropriate for their particular circumstances. The most appropriate HWTS option for a location depends on existing water and sanitation conditions, water quality, cultural acceptability, implementation feasibility, availability of HWTS technologies, and other local conditions. This series of fact sheets is designed to assist organizations in comparing, and ultimately selecting, the appropriate proven HWTS option or options. For more information on household water treatment, please visit www.who.int/household_water. For more information on the household chlorination with the Safe Water System, please visit www.cdc.gov/safewater.

## Household Chlorination

The Safe Water System (SWS) was developed in the 1990's in response to epidemic cholera in South America by the Centers for Disease Control and Prevention (CDC) and the Pan American Health Organization (PAHO). The SWS has three elements:

- Point-of-use water treatment by consumers with a locally-manufactured dilute sodium hypochlorite (chlorine bleach) solution;
- Safe storage of treated water; and,
- Behavior change communications to improve water and food handling, sanitation, and hygiene practices in the home and in the community.

To use the SWS, families add one full bottle cap of the solution to clear water (or 2 caps to turbid water) in a standard sized container, agitate, and wait 30 minutes before drinking.

*A woman in Delhi treats water using the SWS (WHO / Pierre Virot)*

## Lab Effectiveness, Field Effectiveness, and Health Impact

At concentrations that are used in HWTS programs, the hypochlorite solution is effective at inactivating most bacteria and viruses that cause diarrheal disease. However, it is not effective at inactivating some protozoa, such as *Cryptosporidium*. Numerous studies have shown complete removal of bacterial pathogens in SWS treated water in developing countries. In seven randomized, controlled trials, the SWS has resulted in reductions in diarrheal disease incidence in users ranging from 22-84%. These studies have been conducted in rural and urban areas, and include adults and children that are poor, living with HIV, and/or using highly turbid water.

## Benefits, Drawbacks, and Appropriateness

The benefits of the SWS are:

- Proven reduction of most bacteria and viruses in water;
- Residual protection against contamination;
- Acceptability to users because of ease-of-use;
- Proven health impact;
- Scalability; and,
- Low cost.

The drawbacks of the SWS are:

- Relatively low protection against parasites;
- Lower disinfection effectiveness in turbid waters contaminated with organic and some inorganic compounds;
- Potential user taste and odor objections;
- Necessity of ensuring quality control of solution; and,
- Concern about the potential long-term carcinogenic effects of chlorination by-products.

The SWS is most appropriate in areas with a consistent supply chain for hypochlorite solution resupply, with relatively lower turbidity water, and in urban, rural, and emergency situations where educational messages can reach users to encourage correct and consistent use of the hypochlorite solution.

*Nurses using the SWS in a hospital ward (CDC, A. Parker)*

*Manufacturing hypochlorite solution locally in a rural clinic in Haiti (CDC, D. Lantagne)*

## Economics and Scalability

A bottle of hypochlorite solution that treats 1,000 liters of water costs about $0.10 using refillable bottles and $0.11-$0.50 using disposable bottles, for a cost of $0.0001-$0.0005 (0.01-0.05 cents) per liter treated. Education and community motivation add to program costs. SWS programs can achieve full cost recovery (charging the user the full cost of product, marketing, distribution, and education), partial cost recovery (charging the user only for the product, and subsidizing program costs with donor funds), or can be fully subsidized such as in emergency situations.

In the PSI/Zambia project, the average cost per bottle (treating 1,000 liters) of production, marketing, and distribution at project initiation in 1999 was $1.88. This decreased by 82% to $0.33 (0.033 US cents per liter treated) in 2003, when 1.7 million bottles were sold, showing that significant cost efficiencies can be gained as programs grow to scale.

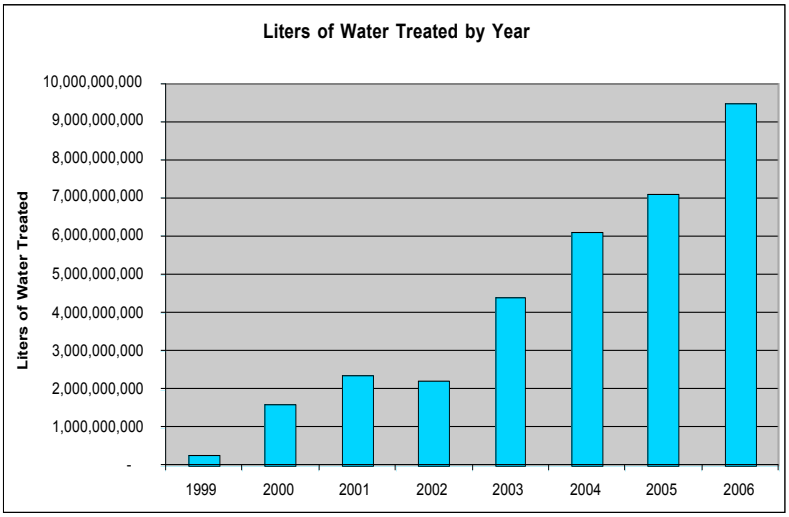
## Implementation Examples

The Safe Water System has been implemented in over 30 countries with numerous partners using a variety of strategies, including:

- Social marketing organizations, such as Population Services International (PSI), sell hypochlorite solution in 20 countries. Over 12 million bottles of hypochlorite solution, treating 12 billion liters of household drinking water, were sold in 2007.
- Local organizations use the social marketed hypochlorite solution in their own programming to provide safe drinking water. For example, in Western Kenya nurses are trained to use SWS water in hospitals and teach patients with diarrhea to use the PSI SWS product WaterGuard. In Uganda, people living with HIV are given WaterGuard to prevent opportunistic diarrheal diseases. In Kenya, schoolchildren are taught how and why to use the SWS, and school safe water clubs treat drinking water for all students. Also in Kenya, HIV self-help groups sell SWS solution and storage containers as an income generating activity.
- Faith-based groups, such as the Jolivert Safe Water for Families program, make and bottle their own hypochlorite solution in rural areas. Local community health workers teach community members how to use the solution, make and distribute the solution, and follow-up with families to educate them on healthy water and sanitation practices.
- Government ministries, such as the Ministry of Health in Guyana, work with local private companies to develop and market hypochlorite solution for emergency response.
- SWS hypochlorite solution has been widely used to respond to emergencies – from the 2004 tsunami in Indonesia to flooding and cholera epidemics in Africa.

For more information on Safe Water System programs, please contact safewater@cdc.gov, or visit www.cdc.gov/safewater, www.psi.org, or www.jolivert.org. Manuals for implementation are available.

*Population Services International, 1999 - 2006*
*Sales of SWS bottles converted to liters of treated water*



# FOREIGN ASSISTANCE FRAMEWORK

| Goal | | "To help build and sustain democratic, well-governed states that respond to the needs of their people, reduce widespread poverty and conduct themselves responsibly in the international system." | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Objectives** | | **Peace and Security** | **Governing Justly and Democratically** | **Investing in People** | **Economic Growth** | **Humanitarian Assistance** | **End Goal of US Foreign Assistance** | **Graduation Trajectory** |
| **Accounts within State/USAID** | | FMF, TI, IMET, ESF, INCLE, NADR, PKO, ACI, FSA, SEED | DA, TI, SEED, FSA, DF, ESF, INCLE, IO&P, ACI | DA, CSH, ESF, IDFA, IO&P, FSA, SEED, GHAI, ACI, Title II | DA, ESF, SEED, FSA, IO&P, ACI, Title II | IDFA, MRA, ERMA, ACI, Title II | | |
| | | Other USG Agency Contributions | | | | | | |
| **Foreign Assistance Program Areas** | | > Counter Terrorism<br>> Combating WMD<br>> Stabilization Operations and Defense Reform<br>> Counternarcotics<br>> Transnational Crime<br>> Conflict Mitigation and Response | > Rule of Law and Human Rights<br>> Good Governance<br>> Political Competition and Consensus-Building<br>> Civil Society | > Health<br>> Education<br>> Social Services and Protection for Vulnerable Populations | > Macroeconomic Foundation for Growth<br>> Trade and Investment<br>> Financial Sector<br>> Infrastructure<br>> Agriculture<br>> Private Sector Competitiveness<br>> Economic Opportunity<br>> Environment | > Protection, Assistance and Solutions<br>> Disaster Readiness<br>> Migration Management | | |
| | **Category Definition** | | | | | | | |
| **Rebuilding Countries** | States in or emerging from and rebuilding after internal or external conflict. | Prevent or mitigate state failure and/or violent conflict. | Assist in creating and/or stabilizing a legitimate and democratic government and a supportive environment for civil society and media. | Start or restart the delivery of critical social services, including health and educational facilities, and begin building or rebuilding institutional capacity. | Assist in the construction or reconstruction of key internal infrastructure and market mechanisms to stabilize the economy. | Address immediate needs of refugee, displaced, and other affected groups. | Stable environment for good governance, increased availability of essential social services, and initial progress to create policies and institutions upon which future progress will rest. | Advance to the Developing or Transforming Category. |
| **Developing Countries** | States with low or lower-middle income, not yet meeting MCC performance criteria, and the criterion related to political rights. | Address key remaining challenges to security and law enforcement. | Support policies and programs that accelerate and strengthen public institutions and the creation of a more vibrant local government, civil society and media. | Encourage social policies that deepen the ability of institutions to establish appropriate roles for the public and private sector in service delivery. | Encourage economic policies and strengthen institutional capacity to promote broad-based growth. | Encourage reduced need for future HA by introducing prevention and mitigation strategies, while continuing to address emergency needs. | Continued progress in expanding and deepening democracy, strengthening public and private institutions, and supporting policies that promote economic growth and poverty reduction. | Advance to the Transforming Category. |
| **Transforming Countries** | States with low or lower-middle income, meeting MCC performance criteria, and the criterion related to political rights. | Nurture progress toward partnerships on security and law enforcement. | Provide limited resources and technical assistance to reinforce democratic institutions. | Provide financial resources and limited technical assistance to sustain improved livelihoods. | Provide financial resources and technical assistance to promote broad-based growth. | Address emergency needs on a short-term basis, as necessary. | Government, civil society and private sector institutions capable of sustaining development progress. | Advance to the Sustaining Partnership Category or graduate from foreign assistance. |
| **Sustaining Partnership Countries** | States with upper-middle income or greater for which U.S. support is provided to sustain partnerships, progress, and peace. | Support strategic partnerships addressing security, CT, WMD, and counter-narcotics. | Address issues of mutual interest. | Address issues of mutual interest. | Create and promote sustained partnerships on trade and investment. | Address emergency needs on a short-term basis, as necessary. | Continued partnership as strategically appropriate where U.S. support is necessary to maintain progress and peace. | Continue partnership or graduate from foreign assistance. |
| **Restrictive Countries** | States of concern where there are significant governance issues. | Prevent the acquisition/proliferation of WMD, support CT and counter narcotics. | Foster effective democracy and responsible sovereignty. Create local capacity for fortification of civil society and path to democratic governance. | Address humanitarian needs. | Promote a market-based economy. | Address emergency needs on a short-term basis, as necessary. | Civil society empowered to demand more effective democracies and states respectful of human dignity, accountable to their citizens, and responsible towards their neighbors. | Advance to other relevant foreign assistance category. |
| **Global or Regional** | Activities that advance the five objectives, transcend a single country's borders, and are addressed outside a country strategy. | | | | | | Achievement of foreign assistance goal and objectives. | Determined based on criteria specific to the global or regional objective. |

Day 4

## WATER, SANITATION AND HYGIENE: HOW DOES THE FINANCING WORK?


**Key messages:**

- Multi-pronged approach is needed to reduce needs while mobilizing finance
- There are many financing options – but they haven't all been widely used in WASH
- Levers are needed to encourage the market to make finance available
- Sanitation has all the water financing challenges, plus a need for demand generation
- USAID has some effective tools – DCA; Partnerships; SUWASA

## WASH Financing

An affordable, reliable and adequate financing strategy is key to the sustainability of WASH services.

Water poses one of the greatest financing challenges in developing countries. WASH is on the boundary between economic infrastructure (e.g. transport, electricity, telecommunications) and purely social infrastructure (e.g. health and education).

In economic infrastructure, you either see prevalence of user charges or there is a high level of public budget (roads). But in social infrastructure it is much more likely to be an exclusive or heavy reliance on public finance.

**Common financial stresses**

- Service providers have limited resources, yet demand is increasing. New infrastructure is needed, but existing works also need to be rehabilitated and services need to be improved.
- There is no blueprint for an "ideal" system of water financing – just as there is no blueprint for a model organization of a water sector. Every country is different.
- Financing of a water or sanitation sector should be coherent, but different parts of the service delivery chain are likely to need different financial solutions. A variety of sources and solutions can be a sign of a healthy sector.
- The water and sanitation sector faces a sustainability challenge because of the emphasis on installing pipes and pumps instead of analyzing the lifecycle cost of service. When a WASH service is unreliable or completely fails, it is the people without access to safe alternatives who are most affected.

## The Financing Challenge

**Looking at the big picture**

Current financing streams will not be sufficient to meet the MDGs. According to OECD, the annual rate of investment needs to double.

It is estimated that the benefit to cost ratio of investing in water and sanitation is 7 to 1, based on the economic and social rewards.

The lack of investment in clean water and sanitation siphons off productive days, economic growth and the health of a population, which results in quantifiable economic loss. However, meeting water and sanitation MDGs could generate **USD 84 billion per year** in benefits.[3]

**Looking at the big numbers**

- 1.1 billion people lack access to safe drinking water.
- 2.4 billion people lack access to sanitation facilities .
- Cost estimates for meeting the drinking water and sanitation MDG target range from USD 6.7 billion to USD 75 billion per year (GLAAS).

[3] World Health Organization (WHO)

| | | |
|---|---|---|
| Not only investments for more infrastructure | → | **But, also financing WASH services…** |
| Not only increased coverage | → | **But, also affordable access for the poor…** |
| Not only doubling the aid | → | **But, also leveraging additional local resources.** |

To develop an effective financing strategy, you must consider:

- **Requirements:** how much do we need?
- **Sources:** where can we get the money?
- **Channels:** how do we move the money to reach the market?

## Requirements

In order to develop a good strategy or program, it's important to have a sense of the amount of money a service will require. There's an evolving body of analysis around the topic.

**Lack of good underlying data**

Financial information might be available at the central level, particularly as it relates to donor funding, but there is seldom any aggregation of sub national and local government expenditures.

Cost information often focuses on expanding service to the un-served. There is less attention to the cost of maintaining and modernizing existing systems.

**Different estimating methods**

Estimates can vary depending on:

- Standard of service assumed and mode of delivery.
- Local geographical and hydrological conditions – presence of adequate water, how far to transport, quality of water and need for treatment, etc.
- Amounts allowed for per capita use.
- Definition of "access."
- Economies of scale in water supply.

**Financial tools and capacity**

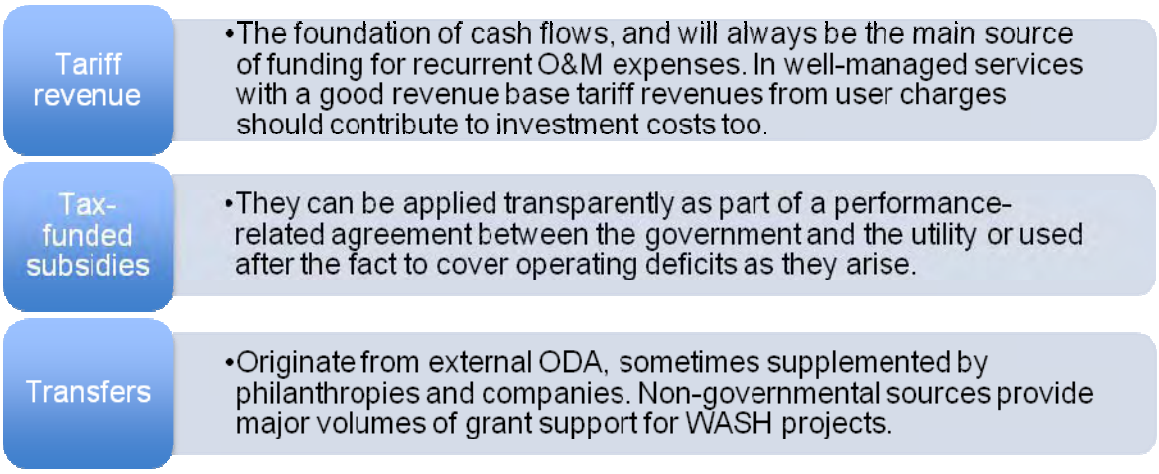
There are several emerging tools/approaches to help estimate costs:

- WASHCost helps countries to look at the whole life cycle of service, and how to mainstream these estimates into planning.

- OECD is developing tools to improve local ability to make financial decisions related to service.
- FEASIBLE is a computerized decision support tool that enables analysis of water supply, wastewater collection and treatment, and municipal solid waste management.
- Strategic Financial Planning Model (SFPM) is a tool for estimating the financing needs versus available funding in the water and sanitation services for different development and policy scenarios.

## Source

WASH services are mainly paid for by three sources, often called the 3 Ts: Tariffs from users, Taxes (like a subsidy) from national taxpayers, or Transfers (grants and loans) from external sources.




**Current global financing sources**

Current flows from the 3 T sources are not sufficient to meet the needs of the sector[4] – either in terms of meeting goals or maintaining existing levels of service.

The majority of the finance is from the public sector – which raises questions about targeting and efficiency. Not enough is being generated through user charges.

- Tariffs: Domestic private 19%
- Taxes: Domestic public 64%
- Transfers: International private 5%; International donors 12%

These trends are not only in developing countries, but are also seen in the U.S.

- EPA estimates a $540 billion gap between current spending and needs in the US.

[4] David Lloyd Owen 2009

- 30 years ago, federal share of clean water infrastructure spending was 75%. By 2001, it was 5%.
- Cities and local utilities spend $63 billion on clean water annually.

In thinking about how to deal with the gap, there are two avenues to pursue:


1. **We can reduce the gap**. Either by reducing the amount of finance we need, or by increasing the amount we bring in from the 3Ts.

   OR

   **We can create a bridge** to get over the gap

**Narrowing the gaps**

Looking first at the potential to reduce the financing needs – we know that less finance is needed if we can provide services more efficiently.

Avenues of efficiency gains include:

**Sector governance is relevant.** A good framework for accountability, transparency and well-articulated goals can lead to less wastage and corruption. Proper governance can also support the integration of incentives for improved performance.

**Operational inefficiencies** include poor revenue collection, distribution losses, and labor inefficiencies. Poor commercial performance (i.e. delays in collecting bills or accumulation of bad debts) leads to cash flow problems, even if tariffs should be sufficient to cover costs.

**Appropriate technology** can make a big difference to costs. Optimizing existing WASH infrastructure can generate substantial savings - by scaling down capacity to match realistic demand or replacing inefficient pumps with new more efficient ones with a long asset life.

**Increasing the "3 Ts"** may seem counterintuitive, but properly set tariffs are more cost effective in the long run and can be used to send other signals to the market.

| Tariffs | Taxes | Transfers |
|---|---|---|
| • Emphasis on cost recovery | • Budgetary commitments | • Use of grant financing where most effective |
| • Transparent, effective regulation | • Appropriate subsidies | • Donor commitments shifting - water to sanitation |

### Sustainable cost recovery

Sustainable cost recovery requires a mix of socially acceptable financing that also promotes financial health of those engaged in providing service (tariffs).

In setting tariffs you have to be attentive to the **level**, the **structure** and the **type** of regulation.

*Level*

In setting tariffs you have to achieve the context-specific balance of your objectives:

- Sending signals on scarcity and demand
- Cost recovery
- Subsidies to meet social objectives
- And creating incentives to invest

*Structure*

The structure of the tariff can be:

- Two part - the fixed part covers access costs; the variable part reflects consumption
- Single tariff
- Rising and decreasing block tariffs

*Type*

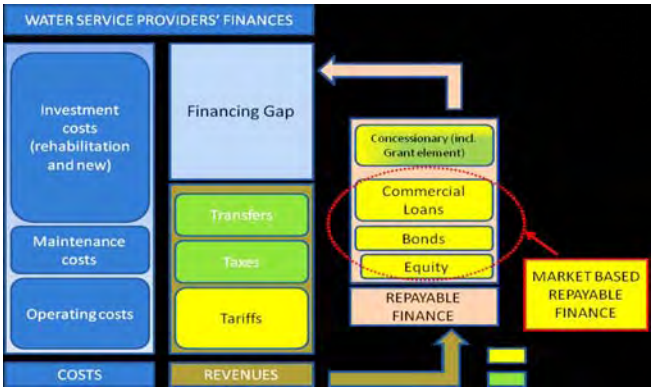
The type of regulation can be distilled to:

- Rate of Return - allows a set, negotiated, rate of return on costs incurred.
- Price Cap - adjusts the operator's prices according to a price cap index that reflects the overall rate of inflation in the economy, the ability of the operator to gain efficiencies relative to the average firm in the economy, and the inflation in the input prices.
- Revenue Cap - follows the same approach as price cap, but regulates not just the price but the whole package of revenue over a set amount of time.
- Benchmarking - emerging field where performance is compared among providers and incentives/penalties built into system.

### Repayable finance

WASH providers look to repayable finance in order to finance capital expenditure for repairs, renewals or expansion of water and sanitation systems while ongoing operating costs and ordinary maintenance are financed from a mix of the 3Ts.

**Figure 16 - Market based repayable finance framework**

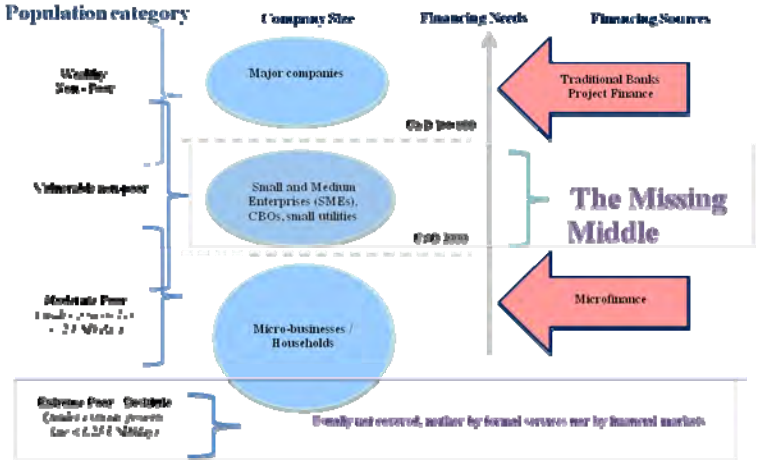


In developing countries, water companies traditionally rely mostly on bank loans (especially concessional loans from development institutions) to finance capital investments but other forms of finance, such as bond finance, project finance or equity finance are gradually emerging.

Market-based repayable finance is a sub-set of repayable finance, where financing is provided through the market by private actors. Market-based repayable finance includes:

- Debt finance
- Microfinance
- Equity finance

**Figure 17 - Comparing population category, company size, financing needs and financing sources, demonstrating the SMEs, CBOs and small utilities are in the most need of financing.**




**Large scale financing**

| **Debt finance** | |
|---|---|
| **Bank loans** | |
| **Corporate finance** | The loan is made to a company or public corporation, which services the debt. The loan may be used for spending on specific projects, but the lender looks at the overall balance sheet of the company in deciding on the loan |
| **Project finance** | The loan is made to a "special purpose vehicle" undertaking the project, and the security for the loan is the expected cash flow from the project. Project finance is also referred to as *non-recourse* lending, because the lender cannot have recourse to the balance sheet of the project sponsor in the event of a default. |
| **Bond finance** | In developed countries, bond financing in the water sector is common as it offers a water provider cheaper access to debt finance than loans. In the majority of less developed markets, municipal bonds are limited due to poor creditworthiness and transparency of water/sewerage companies. |
| **Equity** | |
| **Private placement** | A form of finance in which suppliers ("investors") share the risks of the undertaking in return for the prospect of sharing its profits. |

| | |
|---|---|
| **Share-listings** | Equity does not necessarily have to be private – shares can also be issued by a public corporation or one with majority public ownership (a partial floatation) and hey can be held by public agencies as well as by private individuals and companies. |
| **BOTs and concessions** | Concessions for the operation of entire water systems typically entail the concessionaire using its own finance for essential maintenance and investment during the period of the concession. |

**Small-scale finance**

Small Scale Agents (SSAs) serve a substantial portion of the WASH market, particularly for the poor. Households are primary investors in on-site sanitation and water and SSIPs serve a high percentage of the population, about 40 to 90%. There are two categories of small-scale finance:

- **Microfinance:** primarily to households, often very small.
- **Mesofinance:** to small-scale enterprises, larger amounts. Overall, small-scale finance (SSF) is provided to Small Scale Agents (SSAs) like Households

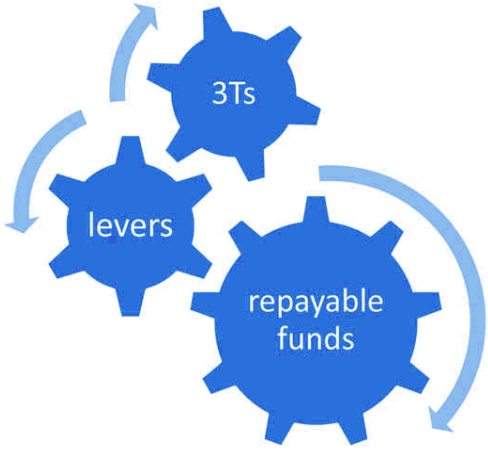
## Market finance

In developing countries, market-based repayable finance is more difficult to mobilize for WASH

- The sector is seen as “high risk / low return” sector.
- The sector is comparatively little known by financiers and there is a mismatch between the long term financing needed and the short term lending capabilities in local markets.
- Availability of funds at local level is restricted. Local government’s credit worthiness tends to be low, making it challenging to raise funds on international markets.

In order to attract commercial finance in its various forms, WASH activities have to have strong enough future cash flows to service the financing.

To do this there are certain “levers” that help mobilize market finance. These involve reducing the risks posed by the water sector to potential funders. These levers include **guarantees**, **insurance**, **co-financing**, and **output-based** aid.



**Levers**

**Guarantees:** Offer insurance against specific risks, such as default on credit or bond repayment, regulatory difficulties and political risks. To encourage financial institutions to lend to creditworthy but underserved borrowers, USAID uses the Development Credit Authority (DCA). DCA is a tool that USAID missions use to stimulate lending through the use of partial credit guarantees. These risk-sharing guarantees generally cover up to 50% of loss on loans made, for instance, to water companies.

**Co-financing and pooling:** Forming grouped financing vehicles can help provide finance to a large number of relatively small borrowers, particularly with the combined use of guarantees to improve credit rating. Such groupings are particularly well suited to decentralized water sectors. They have mostly been used for issuing bonds in countries with fairly mature financial market.

**Output based aid:** Subsidies that are paid only upon certification of a successful outcome, such as new connections to the poor.


### Table Task

Each table is assigned a different financing issue and each member a different role.

As a table, try to identify a “high level” solution that includes financing (e.g. using tariffs, taxes etc.)

Use the space a below to take a few notes and be ready to share with the group.

### Table Task - Discussion

With your table, discuss the following questions and be prepared to share.

- Overall, were you able to achieve your goal of negotiating a financing solution? What was the solution or, if you did not, what options did you have on the table?

- What contributed to successful negotiations?

- What hindered your negotiations?

- How realistic are the challenges you faced in this exercise to challenges you find in your work around financing?

- What lessons learned can be applied from this exercise in the work of USAID in the field?

## Channels

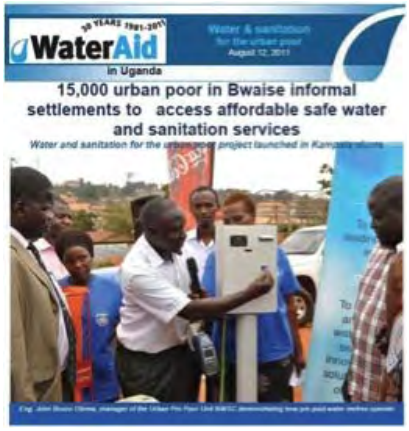
**Invest in planning, capacity, governance**: Strategic financial planning (SFP) matches national water policy to local resources, capacity, and available finance. A key part of SFP is the production of a national consensus on what WASH services the country can or should afford in the long term, and how it will pay for them. Good governance has a direct impact on water's financing prospects – a badly run, insolvent water authority, operating with confused objectives and responsibilities, with an opaque relationship to central and local governments, will have difficulty raising finance

**Attention to affordability:** Affordability is based on the potential for local cost recovery, plus whatever national subsidies and external grants are likely to be available. In setting tariffs, it is common to take an "affordability" yardstick of 3-5% of average household income for WASH. In practice, wealthier people (with connections) normally pay less and poorer people (who supplement their consumption from informal providers) more. There are various ways to make tariffs affordable to poorer consumers:

- Cross-subsidies can be effective.
- Progressive tariff where charges increase with the volume consumed.
- Varying tariffs for different consumers like industrial and commercial users.

If subsidies are used, they should be:

- Predictable – so that the water authority can plan its investment and operations.
- Transparent – so that the subsidy appears clearly in the public accounts, and can be accounted for by the Minister of Finance.
- Targeted – aimed at sections of the population most in need of relief and
- Sufficient – covering all the necessary costs of water provision not funded by the tariff.




There are other techniques to make it easier to generate cost recovery including moving toward a target service level over time. This avoids incurring large initial debts and allows time for consumers to get used to paying for improved services.

**Demand**: The demand, the services to be provided and the financial markets have to be in sync. There is little point in promising services that are unaffordable or unattractive to the market because they will be unfinanceable. Sometimes, the financial markets are less mature than the demand – and the donors can play a key role in bringing the financiers into the WASH sector.

## Rural vs. urban

**Financing issues are magnified at a rural level**

For rural consumers the pressing issue has generally been whether the infrastructure provides water at all. Financing of system has been the purview of donors, NGOs and subsidized activities of government. Increasingly, consumers have been expected to contribute costs, but there has been a continuing expectation that full cost recovery may not be achievable in all rural areas.

For governments to maintain and expand access to safe rural domestic water, they will need to bring in more private financing and use public funds more effectively and efficiently. As living standards increase – this also brings further complications. These same governance and sustainability problems make it difficult for rural systems to attract market finance. Not to mention proximity to financial institutions.

**But local private sector is a growing force….**

The domestic private sector is becoming a serious player in rural public-private partnerships (PPPs). The number of PPPs is increasing worldwide with a variety of new business models, and with some private businesses even developing and marketing affordable sanitation and drinking water products to the poor. In some areas, microfinance organizations are leading the way in providing consumer financing and working capital for small entrepreneurs.

**Figure 18 - Why is there a lack of investment?**


## Sanitation paradigm

Sanitation poses a financing paradox. On the one hand, sanitation is often seen as a household decision, implemented and funded by individual households. On the other hand the safe disposal of human waste and household wastewater has large external benefits to society, which would seem to justify either high charges to households and/or public subsidies for sanitation.

In reality, neither the public nor the private sector has been mobilizing finance effectively.

- **Public/donor finance:** The urban sanitation market is fragmented, which makes channeling subsidies relatively complex.

- **Private finance:** Household finance is limited in part by a lack of demand. For-profit businesses demand high rates of return on investment that are not available at the bottom of the pyramid - unless cost structures and scale are created.

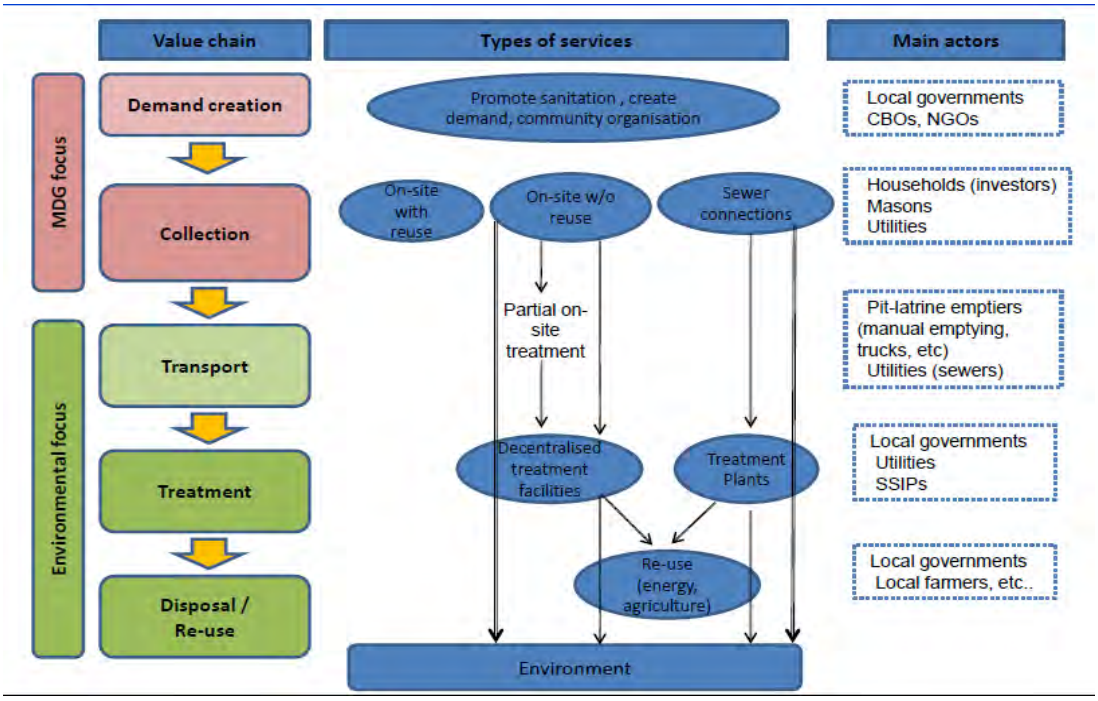
Once demand is generated, the household contributions follow. Likewise entrepreneurs are dependent on this demand, but opportunities exist throughout the service chain of sanitation.

### Creating demand

Creating demand is an underlying theme to the sanitation-financing dilemma. Without this demand, the financing options are largely limited to donors and public subsidies. However, a carefully crafted financial package can be used to generate this demand, such as the use of:

- Grant funds to leverage private and community contributions – creating a blended financing package – and allowing the market to dictate what technologies provide the best value for its money.
- Blend of capital investments (or rehabilitation) and interventions that change the incentives for appropriate operations and maintenance of facilities may thus be required.
- Financing which emphasizes results and blends or coordinates interventions across multiple steps of the value chain would be needed.

**Figure 19 - Comparing value chain, types of services and main actors.**



## Hygiene

Hygiene is **reliant on government budget**, financing from many NGOs and some donors like WSP and USAID.

Therefore, **private sector interests are key to sector finance**. These partnerships leverage significant funding for handwashing related activities.  USAID's annual investment in the Global Public-Private Partnership for Handwashing is $150,000 – and this is leveraged against contributions from Unilever, Colgate Palmolive, P&G, UNICEF, WSSCC, etc.

## Key messages

- Multi-pronged approach is needed to reduce needs while mobilizing finance
- There are many financing options – but they haven't all been widely used in WASH
- Levers are needed to encourage the market to make finance available
- Sanitation has all the water financing challenges, plus a need for demand generation
- USAID has some effective tools
    - **DCA**
    - **Partnerships**
    - **SUWASA**


## INTEGRATED WASH APPROACHES

**Key messages:**

- To maximize benefits, it is important to integrate within WASH to ensure that water supply, sanitation and hygiene all receive adequate attention.
- WASH is a cross-cutting sector that lends itself to integration with other development programs.
- Done strategically, integrated approaches to WASH programming can yield positive synergies and maximize health, economic, environmental, and governance benefits to communities.

## WASH Integration

We realize that sometimes people speak of 'integrated' WASH programming in two very different ways, and that people have questions about both. We will look at two different types of WASH integration here:

1. Integration within the WASH sector, i.e., programming that includes water supply, sanitation, and hygiene in the same program design in a well-coordinated and seamless way.
2. Integration between WASH-sector activities and other development sectors.

Program integration is defined in many ways, and can include one or more of the following:

- Geographic co-location
- Same implementing partner or contract mechanism
- Merged budgets
- Joint design process including more than one sector/subsector
- Interdisciplinary management team / steering committee
- Consolidated reporting

## Integrating within WASH

It is generally accepted best practice within the WASH sector that the individual components of WASH, i.e., water supply, sanitation, and hygiene, all must be present in order to optimize the health and other benefits of services. This doesn't necessarily mean that every USAID program has to focus on every dimension of WASH, but all Agency WASH programs should have a plan in place to ensure that all three critical pillars of WASH are covered in some way.

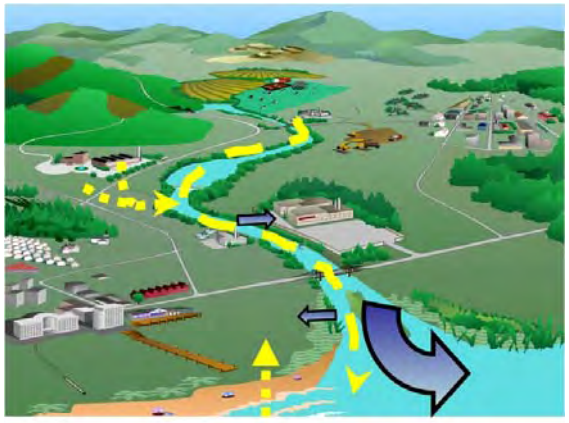
A few lessons learned about integrating within the WASH sector:

- **DO**….. Program water supply, sanitation, and hygiene together in all your programs if possible.
- **DON'T**…..Assume every organization has the capacity do water supply and sanitation and hygiene; **DO**….Get the right expertise – and this may involve more than one specialist organization!!
- **DON'T**…..Go it alone…..; **DO**…..Coordinate with and leverage the work of others – WASH is a collective effort.
- **DO**…..Ensure that cross-cutting/**enabling environment** efforts address all the components of WASH.

## Integrating between WASH and other sectors

There are multiple and valuable linkages between WASH and other development issues confronting the communities in which we work.

**Figure 20 - Graphic depicting upstream - downstream relationship**



In many cases it is hard to achieve the goals of WASH without addressing related development problems like poverty, democracy and governance, or other issues. Similarly, achieving other development goals is made much more challenging if the majority of the poor are condemned to live without sustainable, improved access to water supply and sanitation services. Girls can't attend school, workers are too sick to be productive, local conflict arises over access to resources, and issues of food security are all exacerbated because WASH goals have not been achieved.

Following are a few examples of how WASH activities might be integrated with a few other selected development sectors.

### WASH and HIV/AIDS

**Connections:**

- Diarrhea affects 90% of people living with HIV/AIDS causing significant morbidity and mortality (mostly WASH linked)
- Morbidity and mortality from diarrhea more severe in HIV+ children
- Diarrheal disease reduces absorption of Anti-Retrovirals
- Burden on caregivers in clinics and at home is great

**Interventions:** There are excellent opportunities to program activities that integrate HIV/AIDS programming and WASH programming. Some examples of illustrative interventions that you might want to consider in this area include:

- Integrate best practices into national policy and manuals/tools
- Train water/sanitation implementers, hygiene promoters, health providers and infected people
- Implement "small doable actions"
- Promote water treatment at the point-of-use
- Promote patient-friendly latrines

**Earmark eligibility:** All of the recommended integration activities would be 100% water earmark attributable. Non-water earmarked PEPFAR funds may also be used to support WASH related activities – above and beyond any water earmark funding from DA or GH (MCH) accounts.

PEPFAR funds can support:

- Home-based safe drinking water interventions
- Soap and handwashing promotion
- Sanitation promotion
- WASH Infrastructure

### Food security

**Connections:**

- Use of rural and peri-urban water supply for both domestic and agricultural use is common – e.g., gardens, livestock
- Water systems are not typically designed or managed with this in mind, leading to problems of sustainability, environment, and human health.
- Diarrheal disease from poor WASH contributes to malnutrition and stunting

**Interventions**:

- Integrate WASH and nutrition interventions to increase 'food utilization'
- Grow food or income crops with productive water from Multiple Use Water Services (MUS) to increase 'food availability' and 'food access', and enhance the sustainability of WASH services through increased revenues for services
- Reflect MUS approaches in design, engineering, and management of water supply systems and services.

**Earmark eligibility:**

- All funding for the construction of the multiple use water supply system and distribution network (of which potable water delivery is a primary function), as well as the training of system management committees and hygiene promotion activities are 100% eligible for attribution to the water earmark.
- Funding for 'bulk' water supply (i.e., dams, reservoirs, etc.) of which only a portion of water is used for potable consumption are only partially attributable (10-15% typically).
- Funding associated directly with the small-scale agricultural activities – e.g., drip irrigation, agricultural extension/training, market development, etc. are not at all earmark eligible.
- Funding of non-WASH related nutrition or health promotion is not eligible.

- All other WASH integration activities are 100% eligible.

### Governance

**Connections:**

- Strong and capable municipal governments can support water utility reform and corporatization
- Organization and capacity building of communities around water supply and sanitation provision can lay the groundwork for overall improved governance
- WASH services can serve as incentive for conflict resolution

**Interventions**:

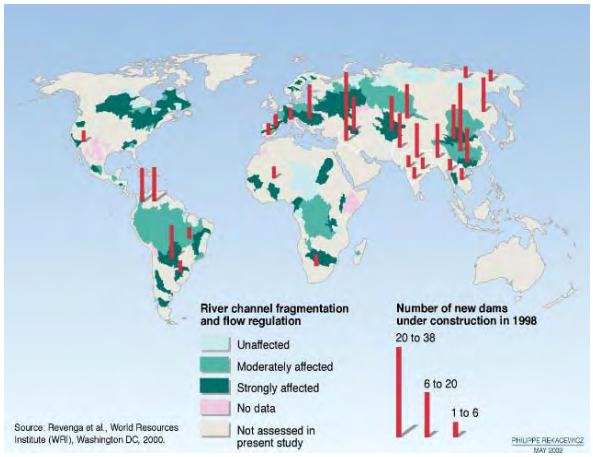
- Invest in municipal government and water supply and sanitation utility capacity building to improve cost recovery, maintenance and management


- Strengthen capacity of local governments in management of services, fiscal responsibility, and public accountability
- Strengthen community / citizen involvement in local governance
- Incorporate service delivery as 'reward' in peace-building

**Earmark eligibility:** The degree to which activities are water earmark eligible depends on how much of them is "general" governance strengthening, versus WASH specific governance-related.

- All funding for water/sanitation management committees, as well as hygiene behavior change and/or sanitation promotion is 100% eligible for attribution to the water earmark
- All funding for strengthening of utility governance (water supply or sanitation/wastewater) is 100% attributable to the water earmark
- Funding associated with broader governance strengthening, e.g., municipalities/local governments is only partially earmark attributable (proportional to the degree that overall local governance duties include WASH (typically 10-15%).

**Figure 21 - Change in global hydrology**



### Environment

**Connections:**

- Untreated domestic sewage can contaminate downstream ecosystems and human water sources
- Climate change vulnerabilities affect WASH services
- Inefficient WASH services contribute to GHG emissions

**Interventions**:

- Watershed management to reduce contamination of potable water supplies used downstream (from soil erosion, agrochemicals, domestic sewage, industrial pollution, etc.)
- Wastewater treatment to complement sanitation investments and protect environmental quality
- Reuse of fecal waste for productive purposes
- Climate change adaptation planning to increase resiliency
- Water/energy use efficiency to support climate change mitigation

**Earmark eligibility**:

- Funding for watershed management, downstream water quality protection, training of water resource managers, information management for water resources planning, etc. is virtually never 100% attributable to the water earmark. Partial attribution may be possible, e.g., in proportion to the amount of total surface water in that watershed consumed by domestic use (typically 10-15%).
- WHO's 'Water Safety Planning' methodology would be 100% eligible for attribution to the water earmark -- a very specific risk/threats-based approach to protection of drinking water quality (not general water quality/watershed protection).
- Climate change mitigation and adaptation activities directly related to WASH services can be supported 100% by the water earmark. Some activities, including broader climate forecasting, analytics, and decision-support systems may be complemented with GCC funding as well.

## Table Task

At your table, discuss the possibility of doing an integrated WASH program with another sector in your Mission. Use the below questions to guide your conversation.

What are the biggest challenges you would face in integrated programming (WASH plus another sector)?

What are some possible solutions to these challenges of integration?

## Integrating between WASH other sectors

A few lessons learned about integrating WASH with programming in other sectors:

- **DON'T**….. Feel you have to integrate everything with everything!; **DO**….. Be **strategic** – avoid integration for its own sake and keep your primary strategic development end as a guide.
- **DO**….. Start early in co-planning; **DON'T**….. Try to "retro-fit" integration (if possible).
- **DO**….. Co-locate site-based activities.
- **DO**…..Creatively mix different pots of money.
- **DO**….. Acknowledge and plan for the time and effort it takes; **DON'T**….. Expect it to be easy!
- **DON'T**….. Think you have to do it alone; **DO**…..Make sure you have champion(s) within the Mission, and **DO**……Get your Mission Director's endorsement for integration.
- **DON'T**….. Assume your implementing partners will integrate voluntarily; **DO**…. Build in requirements for coordination in all implementation agreements.
- **DON'T**….. Forget to share your experience with integrated programming; **DO**….. Measure the outcomes of integration

Day 5

# RESOURCES FOR WATER, SANITATION AND HYGIENE PROGRAMMING

## A range of available resources

We have referenced several documents, websites, and organizations that can serve as technical resources for you once you are back in your home office, organized in the following three categories:

- Information and Learning
- Technical Assistance
- Implementing Mechanisms

## Information and Learning

### ENRM Learning Gateway


The ENRM Learning Gateway is the centralized place for Agency staff to acquire information about competency-based learning opportunities in the environment and natural resources management sector (including WASH) through:

- Learning Paths for ENRM based Backstop 40 competencies
- Training Calendar
- Course Catalog
- Distance Learning classroom
- Learning Resource Library

http://inside.usaid.gov/EGAT/enrm_gateway.html

### Additional Web-based Resources

General information on USAID's water programming is available on the USAID website – both the intranet and the external website. Our internal website has a summary of training information, centrally managed GDAs, publications and resources, annual reports, etc.

- USAID Water and Sanitation public website: http://www.usaid.gov/what-we-do/water-and-sanitation/technicalresources/guidance/tools
- Water Office internal website: http://inside.usaid.gov/E3/offices/natural_res/water/
- WashPlus website: http://www.washplus.org/
- Environmental Health Project website: www.ehproject.org
- GlobalWATERS newsletter (sign up!)

## Technical Assistance

USAID Staff from GH, E3 (Water and I&E Offices), AFR Bureau, and OFDA have provided extensive support to the field in the WASH sector. You can access expertise through:

- •Direct Email or Telephone Contact (GH or E3)
- •E-TRAMS (E3 only)
- •Contractual support mechanisms

### ETRAMS

E3 Travel and Mission Support is a centralized Web application that tracks the travel of E3 personnel. From the ETRAMS website, missions and bureaus can request TDYs and virtual field support from E3 staff. ETRAMS also enables users to track and monitor the status of their requests. A relevant team of E3 staff is automatically sent an email message with the request so that the team can discuss who among them is available and best suited to respond. https://egat.usaid.gov/etrams/

## Implementing Mechanisms

In the context of USAID forward, there is somewhat less emphasis on centrally managed mechanisms for Mission buy in, but there are still a few available that can be accessed for WASH programming. These include:

- Water IQC II (ending) / Water IDIQ (2013)
- Engineering Design and Construction Supervision IQC
- SUWASA Task Order
- WashPlus Cooperative Agriculture
- GLOWS LWA

In addition to information about specific instruments, there is guidance on infrastructure and engineering procurement. For example, if a proposed program includes significant levels of construction of any WASH infrastructure, you will be required to employ an official 'A&E' (architecture and engineering) contractor. The thresholds established in the guidance are:

- A total amount of funding dedicated to construction/infrastructure greater than $10 million dollars, regardless of the size of the overall contract.
- Any single engineering/construction/infrastructure intervention that exceeds $100,000 in value, regardless of the total amount of construction in the contract or grant, or the total value of the contract or grant.

### Other opportunities

In addition to the mechanisms just described, there are some special procurement opportunities available for WASH programming. These include:

1. The DIV office of IDEA has a "special window" co-funded by the Bill & Melinda Gates Foundation for WASH projects. The program is offering a total of $14.6m in grants over 4 years. The process uses same APS solicitation mechanism as main DIV (with the current one closing in April 2013). They are particularly interested in interventions that:
    - Operate in Bangladesh, Ethiopia, Ghana, Haiti, India, Kenya and/or Nigeria
    - Address issues in the sanitation and hygiene sectors in particular
    - Target beneficiaries earning under $2 a day (PPP adjusted)

2. **Development Grants Program** (or DGP) is administered via a series of APS. The call for applications is open to any US or non-US PVO that has received less than $5 million in total from any part of USAID within the last five years. Within the APS, there is usually a special designation for "WASH" or 'water' programs, which varies in amounts and focus countries from year to year.

3. **Global Development Alliances** (GDAs), the Agency's public-private partnership model.. The GDA APSs often have addenda prepared by specific Missions, or to highlight central funding available in specific sectors (e.g., GCC had one in 2012). Note that in addition to Mission-specific GDAs, there are a few global water sector GDAs that multiple Missions have participated in in WASH, including the Coca-Cola Water, Development Alliance (WADA), and the Rotary International/USAID International H20 Collaboration alliance.

More information on the above opportunities is available at: www.usaid.gov/idea

# Additional Resources

## ADDITIONAL RESOURCES

# GLOSSARY

## General definitions

**Corporatization** - Corporatization is a process by which a public sector service provider is transformed to have a commercial orientation like a private company. Corporatization typically includes three activities: (1) establishment of a distinct legal identity for the company with the government's role clearly identified as owner; (2) segregation of the company's assets, finances, and operations from other government operations; and (3) development of a commercial orientation and managerial independence. The guiding intent of corporatization is to capture the advantages of a privately run company - like efficiency, productivity, and financial sustainability - while retaining government accountability.

**Efficiency -** Efficiency in the water field is sometimes assessed in terms of the system's ability to use the minimum water necessary to meet customers' needs (thereby eliminating waste). More typically it refers to incurring the lowest level of operating and capital costs while still meeting the service and quality standards set by the community or regulator. Because water and sanitation systems are capital-intensive (require high levels of investment compared with the sale price of the product) and assets (pipes, buildings etc.) last for many decades (often 20-50 years), efficiency is best examined over a long period to determine whether short term efficiency has been created through skimping on investments in assets.

**Operating Expenses (Opex) and Capital Expenses (Capex) -** In the context of water and sanitation, Opex refers to the expenses incurred in the operations and maintenance needed to provide service. This might include electricity, labor, parts, and chemicals. Capex refers to the cost of investing in new assets or in rehabilitation of existing assets.

**Full Cost Recovery -** Full cost recovery is a term for setting the levels of user charges (like the charge for an amount of water, the cost to use a public latrine, or any fees for connecting to a network) so that they recapture all of the expenses of providing water and/or sanitation services to customers. In principle, full cost recovery would include Opex and Capex (defined above) as well as any debt service. In reality, most African piped water systems aim to cover Opex through user charges, but will continue to rely on government transfers and subsidies and donor support to cover most Capex. Even small rural networks or community managed systems may struggle to achieve operating cost recovery if customers are not properly educated on the costs of providing water, if communities are not organized for payment and/or if the service provided doesn't motivate customers to pay. Most government water policies call for the achievement of some degree of cost recovery in, at least, the urban water sector.

**Peri-Urban –** As rural populations migrate to cities in developing countries, they often create informal settlements or slums, typically at the margin of the city. These areas are often called peri-urban. Slums can also develop in pockets within city limits – these areas are usually called slums or informal settlements rather than peri-urban areas.

**Public private partnership (PPP) -** Public-private partnership refers to contractual arrangements made between public agencies (national or local level) and private service providers and/or investors. These arrangements create a new partnership with assigned responsibilities for the provision of services that are typically provided by the public sector (like water or sanitation). These arrangements include formal legal contracts (like service contracts, management contracts, leases and concessions) and less formal memorandums. The risks, financing, compensation and operational responsibilities assigned to each party differs from contract to contract. PPPs are designed to improve specific aspects of service delivery such as cost recovery, reduction of water losses, improved customer service etc. The assumption is that PPPs assign risks and responsibilities to the party (public or private) that can best handle it. For instance, the private sector may be best suited to tackle problems related to commercial operations while the public sector retains control over aspects of service related to disadvantaged populations. PPP can be controversial, particularly when there is a public perception that the private partner is motivated primarily by a desire to make a profit, even at the expense of the public good. PPP (also sometimes called PSP or private sector participation) is sometimes mistaken for privatization, but privatization includes the actual sale of the water and/or sewerage assets (such as the pipes, treatment plants etc) to the private sector. Only the UK/Wales and Chile have actually privatized the water system assets. PPP often brings new transparency to a sector since obligations are spelled out in a contract or other document, but often there must be another layer of oversight or regulation to ensure that the public interest is met by both public and private partners – and that service performance meets the contractual and regulatory requirements.

**Regulation –** Regulation is a public sector activity undertaken to look after the public interest. Ensuring the public interest requires balancing the interests of the consumers with the interests of the service providers – and promoting efficiency in the sector. In water and sanitation, there are several areas of activity that might be appropriately regulated such as water resource regulation, water quality regulation and economic regulation. Water resource regulation, for instance, would entail issuing abstraction permits to well-owners. An economic regulator determines what prices are reasonable given a particular service level. It might do this by issuing the rules (regulations) within which prices can be set and approving the actual prices. A regulator would typically have the power to monitor adherence to the regulations and to impose sanctions where regulations are not met. Regulators have different degrees of latitude depending on their structure and on the detail of the regulations they are enforcing.

Regulation is often performed by an institution (a regulator) or can be accomplished through detailed documents, like contracts and licenses, without the establishment of a stand-alone regulatory body.

**Tariff -** Tariffs are the established cost per unit of water used by the customer or the cost per unit of wastewater produced by a customer. A tariff is meant to capture some or all of the cost of providing services (energy, chemicals, labor, repairs, etc). Some jurisdictions charge tariffs to households based on consumption using meters or simple assumptions of usage based on housing type; others charge tariffs based on the number of toilets and taps in the home. If customers are buying water from a standpost, the tariff would be a charge per bucket. Tariffs

should be recognized as different from connection fees, which are one-time charges to be connected to water supplies and/or sewer lines; these are intended to cover some or all of the capital costs of building water and wastewater distribution, collection and treatment/disposal facilities.

**Block Tariff –** A block tariff is a system of organizing water prices in bands or blocks. That is – the first "block" might be 0-5 cubic meters of water. Any quantity within the block would be available for a particular price. The second block might be 6-10 cubic meters with a different price. The block tariff system is easy to understand and administer, but doesn't allow for completely accurate pricing. Often, the price increases as the block increases – so consumers pay more per unit if they consume more. This is called an "increasing block tariff" and helps to manage demand.

**Social or Lifeline Tariff –** Governments often choose to subsidize the first block of consumption (usually 0-5 or 10 cubic meters) and offer this water for a very low rate. This ensures that at least this minimum level of water is widely affordable.

**Millenium Development Goals (MDGs) -** The MDGs represent a global partnership that has grown from the commitments and targets established at the world summits of the 1990s. Set for the year 2015, the MDGs are an agreed set of goals in areas including poverty reduction, education, maternal health, gender equality, and aim at combating child mortality, AIDS and other diseases. MDG #7 includes a call for the reduction by half of the proportion of people without sustainable access to safe drinking water and basic sanitation.

## Water related definitions

**Water supply –** The water available in urban and rural areas for drinking and other household uses such as cooking, cleaning and hygiene. People may access their water supply directly (self-supply) or get water through a third party like a water company or a vendor.

**Water access –** This refers to the number of people who have a reasonable means of getting an adequate amount of clean water, expressed as a percentage of the total population. In urban areas "reasonable" access typically means that if there is no household connection, there is a public standpost located within 200 meters of the household. In rural areas, it implies that members of the household do not have to spend excessive time each day fetching water. An adequate amount of water is enough to satisfy metabolic, hygienic, and domestic requirements, usually about 20 liters (about 4 gallons) per person per day. It is important to note that the MDG

Note that the MDG goal for water access requires that people are actually using water from the source (not merely physically close enough) and that the source is "improved." An improved drinking water source is defined as "a source that by the nature of its construction adequately protects the source from outside contamination in particular with fecal matter." An improved sanitation source is defined as "a facility that hygienically separates human waste from human contact."

**Safe Water -** Water is safe or unsafe for household use depending on the amount of bacteria in it. Safe water may be treated surface water or untreated but uncontaminated water, such as from springs, sanitary wells, and protected boreholes.

**Utility –** This is an organization that provides a public service, with responsibility for maintaining and operating the associated infrastructure. Utilities can be public or privately owned.

**Small Scale Provider –** Not all water and sanitation services are provided by utilities. Many people obtain services from small scale providers (SSPs). There are many different names and acronyms for these providers including small scale independent providers, small scale service providers, etc. These providers are entrepreneurs, communities, NGOs or others who operate on a small scale to obtain and distribute water or sanitration services. In the case of water, SSPs may deliver water directly to a customer or expect customers to come to his source. The water itself may be taken from an independent source (like a well) or obtained from the utility (legally or illegally).

**Dug well/Borehole/Tubewell –** Ground water (water below the surface) is obtained through the digging of a well. Wells can be manually dug (dug well), which limits the depth or they can be dug with machinery (borehole). Boreholes are used when the water is far below the surface or when the ground is too hard to dig a well by conventional means. Because they are so deep, they require an electric pump to bring water to the surface. When a borehole has a liner within the shaft, it is called a tubewell.

**House connection or yard tap –** Piped water from the public distribution system (utility) that reaches a home or yard. Yard taps may be shared among several families within a compound.

**Standpost –** This is an outside tap to which a number of households can go to collect water. Public standposts are connected to the public water distribution system. This is a common way for utilities to try to reach large numbers of customers. Private standposts are connected to a private water source like a borehole. This may also be called a standpipe.

**Kiosk –** A water kiosk provides some shelter around a set of taps available for public use. Kiosks can be quite sophisticated and even include other items for sale. They can also be quite basic, consisting of a concrete slap and a basic protecting wall around the taps.

**Reticulated Network** – Water can be distributed through a network of pipes – also called a reticulated network. The pipes themselves are made of polyvinyl chloride (PVC), iron, galvanized steel or other materials. Flexible tubing may be used for some parts of a network for economy and ease of installation.

**Water treatment** – This is the process by which contaminants are removed or reduced in water until it is suitable for household use. Water treatment can be basic or can involve several stages and technologies. The most basic treatment of water is through allowing water to settle – or filtering it. Disinfection is a process of removing, killing or inactivating pathogens found in water and wastewater. Chlorination is a basic way to disinfect. Utilities treat water through a multi-stage process including aeration, coagulation, sedimentation, filtration and disinfection – each of which removes a different potential contaminant or element that may affect taste or

color. These different stages require different technologies. Note that if treated water is transported over a long distance, it may require additional treatment before being consumed. This may be done through additional chlorination.

**Wastewater Treatment –** Wastewater should be treated before being discharged to waterways. This is also a multistage process (primary, secondary and tertiary). Primary treatment is the process to separate solids from liquids requiring further treatment. Secondary treatment breaks down complex organic substances or nutrients which would consume high amounts of oxygen if released untreated. Conventional secondary treatment can be very energy intensive and thus expensive. Tertiary treatment removes inorganic items like nitrogen and phosphorus and can be very expensive. Given the increasing cost of each stage, countries and environmental authorities need to determine to what degree the wastewater must be treated.

## Sanitation related definitions

**Basic Sanitation** – is the lowest-cost technology ensuring hygienic excreta disposal and a clean and healthful living environment both at home and in the neighborhood of users. Access to basic sanitation includes safety and privacy in the use of these services. Basic sanitation coverage is the proportion of people using improved sanitation facilities: public sewer connection; septic system connection; pour-flush latrine; simple pit latrine; and ventilated improved pit latrine.

**Community-Led Total Sanitation (CLTS)** - is a no-subsidy approach that uses an innovative participatory methodology and entails the facilitation of the community's analysis of their sanitation profile, their practices of defecation and the consequences, leading to collective action to become "open defecation free".

**Open Defecation Free (ODF)** – Defecating in the open air (i.e. open defecation) is still widely practiced worldwide. Open defecation free means that feces are no longer openly exposed to the air. Using an open pit latrine with no lid is a form of open defecation, but with a fly-proof lid, with or without the use of ash to cover the feces after defecation, is considered ODF. Defecating into a trench and covering the feces can be part of the transition from OD to ODF.

**On-site sanitation -** is the whole of actions related to the treatment and disposal of household wastewater that cannot be carried away by an off-site sanitation system (often because the low density of population makes such a network uneconomical).

**Communal Latrines –** are latrines that are used by more than one household and may serve an entire or part of a community. The main problem of communal – as well as shared latrines in general – is that they suffer from the 'free rider' effect. Users often shirk the responsibility for operations and maintenance (e.g. cleaning) and the latrine often goes unused or falls into disrepair.

**Pour-Flush Latrine –** consists of a latrine constructed above, or adjacent to, a watertight tank which contains liquid effluent. The excreta drops into the tank through a pipe connected to the toilet. Similar to conventional toilets, the pour-flush toilet maintains a water seal, which requires

water for flushing (generally poured from a bucket). Since this type of latrine uses a very low volume of water, the effluent discharging from the tank is small but concentrated. These systems are suitable in rural and urban areas where soils are permeable to allow the effluent to percolate into the ground and are unsuitable where the ground water table is high because they could potentially pollute the aquifer. They are also often called aquaprivies.

**Sanitation Platform (SanPlat)** - SanPlats are small concrete squatting slabs that can be put on top of traditional latrines to make them more hygienic. SanPlats generally have the following features: smooth and sloping surfaces for easy cleaning; raised foot-rests to enable users to find the right place to squat even in the dark; a keyhole-shaped drop-hole making it safe even for very small children to use; and a tight-fitting lid to stop smells and keep out flies.

**VIP Latrine -** ventilated improved pit (VIP) latrines consist of a lined pit, a concrete slab with a squat hole covering the pit, a roofed shelter and a ventilation pipe covered with a fly screen. VIP latrines have been promoted as one of the main options for rural sanitation in many parts of the world. They have proved to be very popular with users because the vent pipe minimizes bad smells and flies. However, for communities with limited resources and skills, VIPs are still too expensive and complicated to build.

**Septic tanks -** a watertight chamber made of concrete, fiberglass, PVC or plastic, that is typically connected to household toilets, sinks and showers to capture household wastewater for storage and treatment. Settling and anaerobic processes reduce solids and organics, but the treatment is only moderate.

**Sanitation Marketing –** the same rules that apply in marketing, which ensure the right 'marketing mix' (i.e. Product, Price, Place and Promotion) apply to sanitation marketing. This model views the poor as 'customers' rather than 'beneficiaries' and ensures that people choose to receive what they want and are willing to pay for it. The model is financially sustainable, cost-effective and can potentially be taken to scale.

**Septic Tank -** Septic tanks are buried concrete boxes that collect sewage, usually from a single home. The tanks allow the sewage to settle and decay, eventually overflowing into an underground gravel-floored drain or into a sewage network.

**Sewage/Septage/Sludge –** Sewage is household wastewater composed of grey water (from showers, sinks etc) and black water (human excrement and flush water) disposed of through a home's plumbing system. Septage is the material pumped out of a septic tank. Sludge is the semi-solid material that collects at the bottom of the septic tank or a settling tank during wastewater treatment.

**Ecological Sanitation (ECOSAN) -** is a new movement in sanitation that recognizes human excreta and household wastewater not as waste but as resources that can be recovered, treated and reused. Ecological sanitation is usually carried out using either a desiccation or composting process. Sometimes, an extra separation of urine and feces at the source is done to reduce smells from the mixing of urine and feces. Further, urine, which contains most of the nutrients (N, P and K) in excreta, is generally free of disease causing microorganisms.

## Hygiene related definitions

**Hygiene -** WHO helped forge a global consensus on four key globally-important hygiene behaviors in 1992. They include:

Keeping drinking water clean (safe water handling and storage, and, if necessary, water disinfection at the point where it is used.

Keeping hands clean

Keeping the environment clean (from a sanitation perspective, that means free of feces – by ensuring that a safe means of sanitation is effectively used.)

Keeping food clean.

**Behavior change -** Approaches for modifications in practices or behaviors, for better or worse. Hygiene behavior change aims to identify, promote and facilitate improved behaviors that:

Have significant positive impact on health

Are feasible to achieve, (people both willing and able to make changes)

**Hygiene improvement -** A comprehensive approach to preventing diarrheal and other diseases through the widespread adoption of safe hygiene practice such as handwashing with soap, treatment and safe storage of drinking water at the point of use, and safe disposal of feces. It begins with and is built on what local people know, do, and want.

**Hygiene Improvement Framework -** The hygiene improvement framework is a conceptual model developed by USAID that shows how hygiene improvement (diarrheal disease reduction) can arise when three things are in place: 1) improved access to hardware for water supply, sanitation, and hygiene; 2) hygiene promotion; and 3) an enabling environment (policy, community organization, finance, management, and accountability).

**Fecal-oral route of disease -** A route of transmission of diseases, by which fecal particles can be passed from one host - usually human - into the mouth of another potential host. The 'F' diagram is a useful graphic used to summarize the main ways diarrhea is spread by fecal germs contaminating fields, fluids, fingers, flies or food, then eventually being swallowed.

**Point of use (POU) -** Refers to the treatment of water at the point where water is consumed, most commonly in the household, but can also be a school or clinic. Several methods and technologies are available for POU water treatment including chlorination, solar disinfection, boiling, filtration, and combined coagulation/flocculation and disinfection.

**Turbidity -** Cloudiness in water caused by the suspension of individual particles.

**Flocculent -** A substance that when added to water causes suspended particle contaminants to fall to the bottom of a container for removal.  One POU product, Pur, is appropriate for use with cloudy water because it contains a flocculent.

**Coagulant -** A substance that when added to water causes suspended particles or other matter to solidify and congeal so that it can be removed by filtration.

**Social marketing –** A process for influencing human behavior on a large scale using marketing principles for the purpose of societal benefit rather than for commercial profit.

**Small doable actions –** A set of simple and easy to adopt health practices or actions that households can do to improve family and public health. These actions are usually not ideal behaviors, but because they are considered 'feasible' within the local context, they are more likely to be adopted by a broader number of households. Though not ideal, small doable actions are still effective. Small doable actions depend on current practice, the context, social pressures, and beliefs. The only way to identify small doable actions is to carefully examine current behaviors, resources, social pressures and beliefs and make some decisions. A "small doable action" in water scarce areas is to use a water-saving device to facilitate handwashing.

**Tippy tap –** A simple water-saving device constructed from a container (e.g., 5-liter plastic jug) that can provide running water for handwashing and other hygiene-related behaviors. One example is a container, with a small hole near the cap. The container is filled with water and tipped with a stick and rope tied through a hole in the cap. When the container is empty, the cap is unscrewed and the container is removed from the stick. The container is then filled again at a water pump, and reassembled.

# MILLENNIUM DEVELOPMENT GOALS (MDG) DEFINITIONS

## Improved water supply

Access to safe drinking water is estimated by the percentage of the population using improved drinking water sources, as described below. It has been found that people satisfy their basic needs for water if the source can be reached in a round trip of 30 minutes or less. When it takes more than 30 minutes to get to the water source and back, people typically haul less water than they need to meet their basic requirements.

Improved drinking water technologies are those more likely to provide safe drinking water than those characterized as unimproved. However, existing surveys do not provide information on the quality of water, either at the source or in households. Improved sources may still contain harmful substances, and water can be contaminated during transport and storage before consumption in the household. Therefore, the actual proportion of the population using "safe" drinking water is likely to be lower than that using "improved" drinking water sources.

### Improved drinking water sources

- Household connection Public standpipe
- Borehole
- Protected dug well
- Protected spring
- Rainwater collection

### Unimproved drinking water sources

- Unprotected well
- Unprotected spring
- Rivers or ponds
- Vendor-provided water
- Bottled water[5]
- Tanker truck water

## Improved sanitation

Access to sanitary means of excreta disposal is estimated by the percentage of the population using improved sanitation facilities, as described below. Improved sanitation facilities are those more likely to ensure privacy and hygienic use.

[5] Bottled water is not considered improved due to limitations in the potential quantity, not quality, of the water.

### Improved sanitation facilities

- Connection to a public sewer
- Connection to a septic system Pour-flush latrine
- Simple pit latrine[6]
- Ventilated improved pit latrine

### Unimproved sanitation facilities

- Public or shared latrine
- Open pit latrine
- Bucket latrine

[6] Only a portion of poorly defined categories of latrines are included in sanitation coverage estimates.

# WASH INFORMATION LINKS

## FRESHWATER

### International Water Management Institute (IWMI)

This institution is part of the CGIAR system and is a nonprofit, scientific research organization focusing on the sustainable use of water and land resources in agriculture and on the water needs of developing countries. This website provides links to subprograms based on the research themes of basin water management; land, water, and livelihoods; agriculture, water, and cities; and water management and environment. It also links to publications, featured projects, and tools and resources. The site hosts the IWMI Library system, which holds more than 40,000 published monographs, literature, water-related journal articles, maps, and the like. www.iwmi.cgiar.org

### The World Bank Water and Sanitation Program

The WB-WSP is an international partnership to help the poor gain sustained access to improved water supply and sanitation services. The site offers featured links (and news); reports on innovative solutions; highlights of partnerships and events; and links to country fact files and statistics. www.wsp.org

### WHO/UNICEF Joint Monitoring Programme

This effort was initiated at the end of the International Drinking Water Supply and Sanitation Decade (1981–1990) to report globally on the status of the water supply and sanitation sector, and to support countries in improving their monitoring performance to enable better planning and management at the country level. The JMP is now the official arrangement within the UN System to produce information for the UN Secretary General on the progress of achieving the Millennium Development Goals related to water supply and sanitation (including excellent reports and statistics for 2000, 2002, and 2004). This site offers publications, including facts and figures and country data; highlights emerging issues and health topics; and links to research tools. http://www.who.int/water_sanitation_health/monitoring/en/

### The World's Water

This website provides up-to-date water information, data, and Web connections to organizations, institutions, and individuals working on a wide range of global freshwater problems and solutions. It also provides a link to information about international water law and policy at a companion site, the International Water Law Project site. Interested parties may also join an electronic newsletter listserv through this site to stay current with updates to the site and to get the latest global freshwater information available. It also highlights information and links related to conflicts over water. http://www.worldwater.org

## World Water Assessment Program (WWAP)

This portal serves as an “umbrella” for coordinating existing UN initiatives within the freshwater assessment sphere. The primary output of the WWAP is the periodic World Water Development Report (WWDR). The site provides links to various UN agency data and information systems, such as GRID; GEMS-Water; the Global International Waters Assessment (GIWA) of UNEP; the Global Runoff Data Center (GRDC) of WMO; AQUASTAT of FAO; the International Groundwater Resources Assessment Centre (IGRAC) being established by WMO and UNESCO; the water supply and sanitation databases of WHO and UNICEF; and the databases of The World Bank system. It serves as an interactive point for sharing, browsing, and searching the websites of water-related organizations, government bodies, and NGOs, including a range of categories, such as water links, water events, learning modules, and other online resources.
http://www.unesco.org/water/wwap/