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# Best Practices and Lessons Learned from Sanitation Programming at USAID: An Annotated Bibliography

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# Best Practices and Lessons Learned from Sanitation Programming at USAID: An Annotated Bibliography

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KSC Research Series

**ABSTRACT:** This annotated bibliography is a compilation of selected documents produced by USAID water, sanitation, and hygiene programs from 1980s to present. It covers a wide range of relevant topics from sanitation policy and reform to sanitation and capacity building. This document has a special focus on best practices, lessons learned, and evaluation reports from USAID's global experiences in water, sanitation, and hygiene.

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## OVERVIEW

This annotated bibliography is a compilation of selected documents produced by USAID water, sanitation, and hygiene programs from 1980s to present. It is organized into the following topical sections: 1) sanitation policy and reform; 2) sanitation strategic frameworks; 3) sanitation interventions – behavioral, community-based, social marketing, and technological; 4) environmental health studies; 5) integration of sanitation into other health programs; 6) financing for sanitation; 7) sanitation and public-private partnerships; 8) sanitation and capacity building; 9) sanitation in urban populations; and 10) links to additional WASH project resources.

Many of these documents were produced under two USAID flagship projects in water supply, sanitation and hygiene: the Environmental Health Project (EHP) and the Hygiene Improvement Project (HIP). The Water and Sanitation for Health (WASH) Project, implemented from 1981 to 1994, was designed to provide technical guidance in the field of sanitation and hygiene. As one of the main players in the USG response to the International Water Decade initiated by the United Nations in 1980, the WASH Project focused on technological interventions, as well as community-based approaches and behavior change activities. The majority of USAID's programming in water, sanitation, and hygiene has been implemented in the Latin America and the Caribbean region (e.g., El Salvador, Nicaragua, Dominican Republic), with some activities in parts of Africa (e.g., Ethiopia, DRC) and Asia (e.g., India, Indonesia). This resource is a focused set of best practices, lessons learned, and evaluation reports from USAID's global experiences in water, sanitation, and hygiene.

## I. Sanitation Policy and Reform

### *Global*

Elledge, Myles F.; Rosensweig, Fred and Dennis B. Warner (with John H. Austin and Eduardo A. Perez). 2002. *Guidelines for the Assessment of National Sanitation Policies*. Environmental Health Project (EHP).

[http://pdf.usaid.gov/pdf\\_docs/PNACQ104.pdf](http://pdf.usaid.gov/pdf_docs/PNACQ104.pdf)

**Abstract:** Comprised of the USAID Environmental Health Project (EHP) and its partners, a taskforce was formed to assess national sanitation policies. The *Guidelines for the Assessment of National Sanitation Policies* serves as a tool for program managers and implementers to examine and evaluate sanitation policies. It is organized into the following sections: *Background Information; Key Elements in National Sanitation Policies; Assessment Methodology; Guidelines to Assess National Sanitation Policies; and Building on the Assessment.*

USAID. 1993. *Models of management systems for the operation and maintenance of rural water supply and sanitation facilities*. Technical Report 71. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNABN719.pdf](http://pdf.usaid.gov/pdf_docs/PNABN719.pdf)

**Abstract (from USAID DEC):** "This report discusses the many issues and actors that influence the development of operations and maintenance (O&M) management systems for rural water supply and sanitation (WSS) facilities in developing countries. It provides case examples from eight representative countries where various O&M models are in effect: Botswana, Yemen, Sudan, Belize, Tunisia, Indonesia, Benin, and Costa Rica. The report offers recommendations for the most effective operation and maintenance of WSS facilities. Key conclusions are: (1) involving the community in WSS decision-making is essential for effective O&M; (2) the choice of technologies must be congruent with local economic conditions; (3) training in management techniques is usually a necessary component of community-managed facilities; (4) willingness to pay for rural WSS facilities is complex and variable, but individuals usually will be eager to pay for water, but

reluctant to pay for sanitation; (5) spare parts supply, rather than the availability of mechanical skills, is usually a major problem in O&M; (6) despite increasing emphasis on community control, decentralization, and private sector involvement, there will always be a role for government WSS agencies, at least to monitor and assess the effectiveness of management arrangements; (7) government extension agents are a critical communication link between the government and the communities; and (8) strong national leadership is needed to build popular confidence in the wisdom and equity of WSS and O&M policy. (Author abstract, modified)”

USAID. 1993. *Designing and Implementing Decentralization Programs in the Water and Sanitation Sector*. Technical Report 89. Water and Sanitation for Health (WASH) Project. [http://pdf.usaid.gov/pdf\\_docs/pnabp595.pdf](http://pdf.usaid.gov/pdf_docs/pnabp595.pdf)

**Abstract (from USAID DEC):** “During the past several years, many developing countries have made major efforts to decentralize the delivery of public service. Factors driving these efforts include public pressure for improved services, the explosive growth of cities, a desire to push responsibility down to lower levels of government, economic reform, and democratization. The trend toward decentralization coincides with the growing use of the private sector as an alternative to government-provided services. This paper was written for project designers and implementers involved in the decentralization of water supply and sanitation services. The document does not provide guidance on whether or not to decentralize -- rather it focuses on the process of decentralization. The premise is that successful decentralization requires redefining the functions of the central government and strengthening local or provincial structures. The paper defines decentralization in the water and sanitation sector; determines the key sectoral and contextual issues to be assessed before designing a decentralization program; discusses the major elements necessary in a decentralization program; and provides guidance on the implementation of a decentralization program. The paper covers urban and rural water supply and sanitation, as well as peri-urban services. (Author abstract).”

USAID. 1991. *Principles of tariff design for water and wastewater services*. Water and Sanitation for Health (WASH) Project. [http://pdf.usaid.gov/pdf\\_docs/PNABJ655.pdf](http://pdf.usaid.gov/pdf_docs/PNABJ655.pdf)

**Abstract (from USAID DEC):** “This report, the third in the WASH Financial Management Series for water supply and sanitation agencies, discusses the principles of tariff design. It is intended primarily for: (1) A.I.D. and host-country personnel involved in program design and evaluation; (2) A.I.D. and host-country program administrators; and (3) technical and financial staff of utilities. Tariffs are used primarily to recover costs and achieve financial stability but also for efficient allocation of scarce sector resources, equitable income distribution, and fiscal viability. Even the most carefully designed tariff cannot accomplish all these objectives without trade-offs among them. The underlying principle is that the beneficiaries of a public service should pay the costs, but controversy surrounds the question of which costs a tariff should cover. A utility must meet the costs of operations and maintenance, capital, short-term loans, and fund reserves. The magnitude of these costs is determined by the levels of service it provides, and the levels of service in turn are influenced by several institutional and technical factors. Cost centers, an accounting device for disaggregating costs into discrete units or activities, facilitate the design of tariffs. But establishing realistic tariffs must also take into account the efficiency of operations, unaccounted-for water, the utility’s institutional capability, and the accurate prediction of ability and willingness to pay. Once the costs of providing water and wastewater services have been correctly identified, a suitable method of cost recovery must be selected. This report discusses a wide range of options and examines their advantages and disadvantages. The two most commonly used methods are metering and lump-sum payments. But in the final analysis, a utility should choose the method or combination of methods it believes will work best. (Author abstract, modified)”

USAID. 1988. *Managing institutional development projects: water and sanitation sector*. Technical Report 49. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNAAZ920.pdf](http://pdf.usaid.gov/pdf_docs/PNAAZ920.pdf)

**Abstract (from USAID DEC):** "Developed on the basis of seven years' work with a water and sanitation project in Sri Lanka, this manual is designed to provide practical and immediately useful information on how to plan and manage institution-building projects in the water and sanitation sector. Elements of successful projects are discussed first, in a section covering pre-design and design issues, specification of goals, sequencing of activities, and project start-up. Lessons learned - primarily from the author's own field experience - are then set forth under the following headings: change management; the nature of the consulting relationship; skills and technology transfer; managing the process of institutional change (steering and management committees, focus groups, task forces); project review mechanisms (monitoring workshops, formal evaluation); decision-making in the cultural setting; and managing external forces. Most of these lessons are applicable to institution building in other sectors as well. Appended are a short bibliography and a number of worksheets to be used in evaluating institutional performance."

#### *Latin America and the Caribbean*

Fragano, Frank; Linares, Carlos; et al. 2001. *Case studies on decentralization of water supply and sanitation services in Latin America*. Environmental Health Project (EHP).

[http://pdf.usaid.gov/pdf\\_docs/PNACK672.pdf](http://pdf.usaid.gov/pdf_docs/PNACK672.pdf)

**Abstract:** Many countries in Latin America have shifted from a centralized model of the water supply and sanitation (WSS) sector to a decentralized system (and working with the private sector) as a result of poor services received from the existing structure. The case studies presented in this document feature successful models of WSS with a focus on regulatory, management, and service provision issues for rural and small communities in Colombia, Paraguay, El Salvador, Nicaragua, and Honduras.

#### *Dominican Republic*

Johnson, Eric and Eduardo A. Perez. 2002. *Creating an enabling environment for community-based rural water supply, sanitation and hygiene promotion systems: case study*. Environmental Health Project (EHP).

[http://pdf.usaid.gov/pdf\\_docs/PNACR116.pdf](http://pdf.usaid.gov/pdf_docs/PNACR116.pdf)

**Abstract:** This report describes community-based rural water supply and sanitation (WSS) and hygiene activities supported by the Environmental Health Project (EHP) in the Dominican Republic. USAID worked in collaboration with the National Water Supply and Sewage Institute (INAPA) to help improve the community-managed RWSS program, including implementing policy changes and developing operational and management guidelines. Multiple lessons learned from this project are presented, notably that in order for rural WSS to succeed, achievements need to be made in urban WSS and that different sets of skills are required to support sanitation and hygiene activities at the household level and the community level.

#### *Peru*

Edwards, Dan; Davis, Jennifer; and Eugenio Bellido, with collaborator Ruddy Noriega. 2004. *Evaluation of Peru's National Sanitation Policies*. Environmental Health Project (EHP).

[http://www.ehproject.org/PDF/Joint\\_Publications/JP0012E-PeruSanitationPolicyFormat.pdf](http://www.ehproject.org/PDF/Joint_Publications/JP0012E-PeruSanitationPolicyFormat.pdf)

**Abstract:** In this document, the authors discuss the results of an evaluation conducted to assess sanitation policies in Peru, particularly for the poor in urban and rural areas. The

evaluation team examined the following areas for improved sanitation: 1) political will; 2) target population; 3) service levels; 4) legal framework; 5) health, environmental, and financial considerations; and 6) roles and responsibilities of institutions. As part of the recommendations, one of the priority items was to consider a three-pronged national strategy: provide cheaper technological interventions; introduce subsidies and/or credit programs; and maintain affordable options through cross-subsidies.

### *India*

Desmond, Kathy (ed). 2001. *Independent regulatory framework for water and waste water in Maharashtra [India]*. TCG International, LLC. Planning and Development Collaborative International, Inc. (PADCO). Financial institutions reform and expansion: debt market component (FIRE(D)).

[http://pdf.usaid.gov/pdf\\_docs/PNACN028.pdf](http://pdf.usaid.gov/pdf_docs/PNACN028.pdf)

**Abstract:** As part of the FIRE(D) Project Note series, this paper reports on experiences from Maharashtra state, India with reforming regulation for improved water supply and sanitation services, especially to the poor. A new committee, Maharashtra Water and Waste Water Regulatory Commission (MWRC) was established to oversee these services, including setting tariffs and coordinating activities with other regulators.

## **II. Sanitation Strategic Frameworks**

### *Global*

USAID. 2008. *Moving toward a strategic approach to sanitation at USAID*. Background paper prepared for: USAID Sanitation Consultation, 19-20 Jun 2008. Washington, DC: Academy for Educational Development (AED).

[http://pdf.usaid.gov/pdf\\_docs/PNADN288.pdf](http://pdf.usaid.gov/pdf_docs/PNADN288.pdf)

**Abstract:** This document serves as a background paper for the USAID Sanitation Consultation, which took place in June 2008. Its contents include the rationale for prioritizing sanitation at USAID, current USAID sanitation programs, and the way forward in developing and implementing a strategic approach to sanitation at USAID.

USAID. 2008. *Sanitation consultation: summary notes*. USAID Sanitation Consultation, 19-20 Jun 2008. Washington, DC: Academy for Educational Development (AED).

[http://pdf.usaid.gov/pdf\\_docs/PNADN290.pdf](http://pdf.usaid.gov/pdf_docs/PNADN290.pdf)

**Abstract:** Prepared by the Academy for Educational Development (AED), this report provides an overview of the proceedings of the USAID Sanitation Consultation. These are some of the themes covered during the meeting: examples of USAID programs from the field; current USAID sanitation activities; partnerships and collaborations; sanitation marketing; financing through private sector; national policies; sanitation for the urban poor, integration with HIV/AIDS programs; and capacity building.

USAID. 2004. *Advancing environmental health for disease prevention: past experiences and future priorities -- lessons learned from EHP 1999-2004*. Environmental Health Project (EHP).

[http://pdf.usaid.gov/pdf\\_docs/PDACA584.pdf](http://pdf.usaid.gov/pdf_docs/PDACA584.pdf)

**Abstract:** The Environmental Health Project II (EHP II) was the follow-on project to EHP I and Water and Sanitation for Health (WASH) projects supported by the USAID Bureau for Global Health from 1999 to 2004 which implemented a wide range of environmental health activities. This report documents key lessons learned from the EHP to prevent disease, with emphasis on the applications of the Hygiene Improvement Framework (HIP) to various programming such as child health, primary health care, and vector control.



Sorti, Charlotte (ed). 2004. *Hygiene improvement framework: a comprehensive approach for preventing childhood diarrhea*. USAID, U.N. Children's Fund (UNICEF), Water Supply and Sanitation Collaborative Council (WSSCC), World Bank (IBRD). Environmental Health Project (EHP).

[http://pdf.usaid.gov/pdf\\_docs/PNACX787.pdf](http://pdf.usaid.gov/pdf_docs/PNACX787.pdf)

**Abstract:** Under the Environmental Health Project (EHP), the Hygiene Improvement Framework (HIF) was developed as a comprehensive strategy to prevent diarrhea. It focused on three main elements: 1) increased access to water and sanitation technologies ("hardware"); 2) hygiene promotion; and 3) improved enabling environment. Examples from the field utilizing this approach were featured throughout the document. In Mozambique, UNICEF provided support for building latrines at primary schools and promoted hygiene for students and teachers through both school- and community-based activities. A successful pilot program in Central America involved multiple public-private partnership for handwashing promotion using the HIF approach for a cost-effective and sustainable program.

Kleinau, Eckhard; Post, May and Fred Rosensweig. 2004. *Advancing hygiene improvement for diarrhea prevention: lessons learned*. Environmental Health Project (EHP).

[http://pdf.usaid.gov/pdf\\_docs/PNADA451.pdf](http://pdf.usaid.gov/pdf_docs/PNADA451.pdf)

**Abstract:** This lessons learned document from the EHP provides an overview of the main successes and challenges in implementing the hygiene improvement framework for preventing diarrhea. One of the valuable lessons is how flexible and adaptable the HIP approach proved to be to various programs ranging from urban health to child health to primary health care. Other lessons learned are organized into the following topics: 1) programmatic context; 2) designing and implementing hygiene promotion activities; 3) creating an enabling environment; and 4) monitoring and evaluation.

USAID. 1991. *Evaluation guidelines for training in water and sanitation*. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNABH790.pdf](http://pdf.usaid.gov/pdf_docs/PNABH790.pdf)

**Abstract (from USAID DEC):** "This document focuses on training; however, references are also made to the other important human resources development (HRD) functions, since they affect training. HRD, as defined by the World Health Organization (WHO) consists of three interrelated functions: planning, training, and management. A wide range of organizational strategies and activities are related to one or more of these three functions, including education and training; recruiting, hiring, and promotion policies; supervision and management; benefits; HRD planning; and occupational welfare. This document provides a systematic "how to" approach for evaluating the effectiveness of training activities in the water supply and sanitation sector. The guidelines primarily focus on training results: how to evaluate skills gained in a training program and how to evaluate the impact of those skills in the workplace. The ultimate purpose of the guidelines is to improve and sustain water and sanitation services. As noted, this document primarily focuses on one HRD function: training. As an evaluation tool, it will contribute to the water supply and sanitation sector in three specific ways: (1) help ensure that scarce resources are effectively deployed to deal with priority problems; (2) contribute to better designed and implemented training activities; and (3) contribute to other aspects of institutional upgrading that are essential for improving the delivery of sector services. The guidelines are not meant to be prescriptive. They do not, for example, specify generic indicators that should be used in evaluating all training activities. Because training can cover a wide range of skills and disciplines, a wide variety of indicators may be found appropriate or useful. Such indicators should be

established during the developmental phase of each training activity. (Author abstract, modified)”

USAID. 1988. *Guidelines for Institutional Assessment: Water and Wastewater Institutions*. Technical Report 37. Water and Sanitation for Health (WASH) Project. [http://pdf.usaid.gov/pdf\\_docs/pnaaz336.pdf](http://pdf.usaid.gov/pdf_docs/pnaaz336.pdf)

**Abstract (from USAID DEC):** “Arguing from the premise that the basic problems facing the water and wastewater (W&WW) sector are institutional in nature, this document provides a set of procedures for diagnosing deficiencies in W&WW institutions. The guidelines are based on team field investigation procedures which identify, define, and verify institutional performance using functional categories which were developed through field analyses of W&WW institutions in two developing countries. In order of relative importance, the categories are: (1) organizational autonomy; (2) top leadership; (3) management and administrative systems; (4) commercial and consumer orientation; (5) technical capability, along with staff development and maintenance; and (6) organizational culture, along with interactions with key external institutions. To ensure rigor and balance, it is suggested that the analysis take place in five steps: data analysis by individual team members and then by the team as a whole; synthesis of findings, including the weighting of different dimensions; preliminary presentation of the analysis to a review committee; and reverification of findings prior to final presentation. The intended end result of the procedure is a defined profile of institutional strengths and weaknesses which can be used for designing institutional improvement projects.”

#### *El Salvador*

USAID. 2006. *Strategic objective no. 519-004: 'increased access by rural households to clean water', 1998-2005 -- close-out report*. USAID Mission to El Salvador. [http://pdf.usaid.gov/pdf\\_docs/PDACI143.pdf](http://pdf.usaid.gov/pdf_docs/PDACI143.pdf)

**Abstract:** In 1997, the Strategic Objective (SO) “*Increased Access by Rural Households to Clean Water*” was approved. Under this SO, USAID/El Salvador established the Access, Management and Rational Use of Water (AGUA) activity which aimed to provide access to clean water in a sustainable manner. There were many lessons learned from this activity, notably: the successful collaborative efforts of local and international NGOs; the application of an entrance and exit strategy for community participation; and the strategic selection of intervention areas and technologies using a “watershed management criteria.”

### **III. Sanitation Interventions**

#### *Behavioral*

##### Global

Gil, Ana; Lanata, Claudio; Kleinau, Eckhard; and Mary Penny. 2004. *Children's Feces Disposal Practices in Developing Countries and Interventions to Prevent Diarrheal Diseases: A Literature Review*. Environmental Health Project (EHP). [http://pdf.usaid.gov/pdf\\_docs/PNACY780.pdf](http://pdf.usaid.gov/pdf_docs/PNACY780.pdf)

**Abstract:** This literature review covers 33 household studies conducted in 16 countries of children’s practices in disposal of feces. As very few studies have examined the relationship between such practices and diarrheal episodes, it is an important study that contributes to the knowledge base for diarrhea prevention programs.

### West Africa

Cogswell, Lynne. 2004. *Strengthening hygiene promotion in the West Africa Water Initiative (WAWI) partnership in Ghana, Mali, and Niger: assessing the capacity of WAWI partners to promote hygiene*. Environmental Health Project (EHP).

[http://pdf.usaid.gov/pdf\\_docs/PNACY997.pdf](http://pdf.usaid.gov/pdf_docs/PNACY997.pdf)

**Abstract:** In this report, Cogswell examines the capacity of the West Africa Water Initiative (WAWI) partners to conduct hygiene promotion activities following the principles of the hygiene improvement framework. Based on the findings of the assessment, several key recommendations include: creating a comprehensive approach to enhance work of partnerships; providing training on behavior change methods; and bringing out strengths of partners for a more sustainable intervention.

### Ethiopia

Amhara National Regional State Health Bureau. 2008. *Woreda Resource Book: Community-Led Total Behavior Change in Hygiene and Sanitation*. World Bank Water and Sanitation Program and USAID Hygiene Improvement Project (HIP).

<http://www.hip.watsan.net/page/2876>

**Abstract:** This resource book from the Amhara National Regional State Health Bureau, presents 12 action steps to achieve a *community-led total behavior change in hygiene and sanitation (CLTBCHS)*. It focuses on three key behaviors: 1) “safely dispose of child and adult feces”; 2) “wash hands with water and soap or ash at four critical times”; and 3) “safely manage household drinking water from water source to mouth.”

### Madagascar

Academy for Educational Development, Inc. (AED). 2007. *Conducting Trials of Improved Practices in Madagascar*. Hygiene Improvement Project (HIP).

<http://www.hip.watsan.net/page/2472>

**Abstract:** The Hygiene Improvement Project (HIP) conducted Trials of Improved Practices (TIPs) in Madagascar to investigate the practicability of households in utilizing a set of actions to support hygiene health. This set of improved practices promote: safe treatment and storage of drinking water; safe disposal of feces using latrines; and washing hands with soap at critical times.

### Indonesia

USAID and the World Bank. 2006. *Formative research report: hygiene and health*. Development Alternatives, Inc. (DAI). Environmental Services Program (ESP) and Water and Sanitation Program for East Asia and the Pacific (WSP-EAP).

[http://pdf.usaid.gov/pdf\\_docs/PNADL923.pdf](http://pdf.usaid.gov/pdf_docs/PNADL923.pdf)

**Abstract:** In Indonesia, USAID's Environmental Services Program worked in collaboration with the Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs (CCP) to conduct formative research for development of a comprehensive hygiene and health communications approach. Specific findings from this research suggest a need to incorporate concepts such as values placed on clean households and its relationship with external environment.

### Nepal

Academy for International Development, Inc. (AED). 2006. *Bringing the Consumer to the Table: Perceptions and Practice of Household Water Treatment Methods in Nepal*. Hygiene Improvement Project (HIP).

<http://www.hip.watsan.net/page/2497>

**Abstract:** Supported by USAID and UNICEF, a “point-of-use product trial” was carried out in four districts of Nepal to help develop a national Point-of-Use (POU) Marketing Strategy as well as a hygiene improvement strategy. This report documents findings from the formative research that contributes to the knowledge base from the consumer on perceived benefits and challenges to water treatment techniques.

#### Latin America and the Caribbean

Favin, Michael. 2004. *Promoting hygiene behavior change within C-IMCI [integrated management of childhood illnesses, community level]: the Peru and Nicaragua experience*. Environmental Health Project (EHP) and Pan American Health Organization (PAHO).  
[http://pdf.usaid.gov/pdf\\_docs/PNADA693.pdf](http://pdf.usaid.gov/pdf_docs/PNADA693.pdf)

**Abstract:** Since 2002, the Environmental Health Project and Pan American Health Organization have implemented the Hygiene Behavior Change Project in Peru and Nicaragua, which works within the Community Integrated Management of Childhood Illness (C-IMCI) framework. After one year of implementation, key hygiene behaviors were found to be practiced within the households. Much of this success was attributed to education and counseling sessions from community promoters and increased access to hygiene products.

#### Dominican Republic

Bendahmane, Diane B. 2004. *Summary report: combining hygiene behavior change with water and sanitation in the Dominican Republic*. Environmental Health Project (EHP)  
[http://pdf.usaid.gov/pdf\\_docs/PNACY998.pdf](http://pdf.usaid.gov/pdf_docs/PNACY998.pdf)

**Abstract:** In the Dominican Republic, the Environmental Health Project (EHP) supported integration of a behavior change intervention to its water and sanitation activities. Several key lessons learned discussed include: achievement of high level stakeholder engagement through participatory monitoring; relationship building between households and promoters through negotiated interviews; and acceptance of behavior change technique as integral to project.

#### Peru

PRISMA. 2004. *Behavioral study of handwashing with soap in peri-urban and rural areas of Peru*. Environmental health project (EHP).  
[http://pdf.usaid.gov/pdf\\_docs/PNACY931.pdf](http://pdf.usaid.gov/pdf_docs/PNACY931.pdf)

**Abstract:** This study of handwashing behaviors with soap provides information for a behavior change campaign to reduce childhood diarrhea in Peru. It covers general population characteristics, prevalence of diarrheal disease, current handwashing behaviors, incentives and challenges to improved practices, and target audiences, communications channels and media.

#### *Community-based*

#### Global

USAID. 2004. *Assessing Hygiene Improvement: Guidelines for Household and Community Levels*. Environmental Health Project (EHP).  
[http://www.ehproject.org/PDF/Strategic\\_papers/SR-8-HISGPaperVersion.pdf](http://www.ehproject.org/PDF/Strategic_papers/SR-8-HISGPaperVersion.pdf)

**Abstract:** Developed under the Environmental Health Project (EHP), the *Assessing Hygiene Improvement: Guidelines for Household and Community Levels* is intended to assist program managers to develop and evaluate hygiene improvement activities at the community and household levels.

### West Bank

USAID. 2002. *Village wastewater system feasibility report for the West Hebron and South Nablus clusters: final report*. Environmental Health Project (EHP).

[http://pdf.usaid.gov/pdf\\_docs/PNACX983.pdf](http://pdf.usaid.gov/pdf_docs/PNACX983.pdf)

**Abstract:** This feasibility report provides the key results from an assessment conducted in 46 villages of the West Bank to design a village water and sanitation (VWS) program. Building community awareness for improved sanitation was one of the first recommended steps to establishing a VWS program, after which a community-based solution to the most appropriate technology would be carried out.

### Latin America and Caribbean

Lockwood, Harold. 2002. *Institutional Support Mechanisms for Community-managed Rural Water Supply & Sanitation Systems in Latin America*. Environmental Health Project (EHP).

[http://www.ehproject.org/PDF/Strategic\\_papers/SR-6.pdf](http://www.ehproject.org/PDF/Strategic_papers/SR-6.pdf)

**Abstract:** This publication provides guidance for supporting a sustainable community management of water supply and sanitation systems in rural Latin America, with case studies from Colombia, Costa Rica, and Honduras.

### Dominican Republic

Johnson, Eric and Eduardo A. Perez. 2002. *Creating an enabling environment for community-based rural water supply, sanitation and hygiene promotion systems: case study -- reforming the Rural Department of the National Water Agency (INAPA) in the Dominican Republic*.

Environmental Health Project (EHP).

[http://pdf.usaid.gov/pdf\\_docs/PNACR116.pdf](http://pdf.usaid.gov/pdf_docs/PNACR116.pdf)

**Abstract:** Johnson and Perez outline the main elements to achieving an enabling environment for community-based rural water supply and sanitation systems in the Dominican Republic. Several lessons learned addressed in this document relate to dedication for additional time and resources in facilitating the implementation process of a new policy and simultaneous reforms for rural and urban water supply and sanitation systems.

### Benin

Krieger, Laurie; Gellar, Sheldon; *et al.* 2002. *The GESCOME difference: lessons learned from gestion communautaire de sante environnementale (GESCOME) -- the environmental health project II -- CESH [community-based environmental sanitation and health] Benin activity*.

Environmental Health Project (EHP).

[http://pdf.usaid.gov/pdf\\_docs/PDABX500.pdf](http://pdf.usaid.gov/pdf_docs/PDABX500.pdf)

**Abstract (from USAID DEC):** "This report documents lessons learned from Phase II (9/99-5/01) of the Environmental Health Project's (EHP) community-based environmental sanitation and hygiene (CESH --aka GESCOME) activity in Benin, designed to prevent transmission of diarrheal disease to children under age 5. The CESH approach is an effective instrument for stimulating community changes in health understanding, and probably health practices, as well as building and maintaining physical infrastructure for diarrheal disease prevention in rural towns. CESH combines participatory problem identification and analysis, solution finding, and health communication with a good governance component; it also stresses coalition building between local government, civil society, and communities. CESH has: (1) used local communities' own traditions to generate and communicate vital health information rapidly; (2) included groups reflecting multiple sectors of the local society in all aspects of the participatory CESH process; (3) built broad support and trust among local administrators, technical service agents, civil society leaders, and communities to mobilize resources to construct and maintain latrines

and water resource points; (4) given local communities a strong sense of ownership by giving them full responsibility to choose and manage their micro-projects; (5) provided appropriate low-cost technologies easily managed by people with relatively little formal education; and (6) reduced the need to use expensive external TA to supervise and manage local environmental health interventions. GESCOME showed that, with minimum external supervision, local communities can successfully establish and manage effective, decentralized, autonomous decisionmaking structures. To attain these results, communities must employ and master low- cost simple technologies that provide a desirable public service sustained and financed by public support. Elements in the decisionmaking structures included: effective linking of community groups and informal neighborhood groups with local elected officials, municipal/commune-level government and departmental administration; delegation of decisionmaking to local communities to manage microprojects as they see fit; and establishment and enforcement of rules ensuring transparency and accountability. Key elements that facilitate the CESH approach include: strong support at the departmental and municipal levels; a tradition of community-level participatory decisionmaking; presence of an enthusiastic development champion; perceived or easily perceptible advantages of adopting practices to decrease children's risk of diarrheal disease; local beliefs about diarrheal disease causation that do not have important symbolic or social meaning in local cultures; and reliable local resources to finance construction and maintenance of infrastructure (latrines, water resource points, etc.). Participatory projects should take into account seasonality factors that could affect participation and resource mobilization. The projects should be of sufficient duration (4-5 years) to ensure that sustainable institutions and knowledge generation and communication methods are developed. Key elements affecting the amount of time needed are detailed, as are suggestions for scaling up the CESH process to an entire country."

#### Malawi

DeGabriele, Joseph. 2002. *Improving community-based management of boreholes: a case study from Malawi*. University of Wisconsin at Madison. Land Tenure Center (LTC) and USAID. Broadening access and strengthening input market systems collaborative research support program (BASIS CRSP).

[http://pdf.usaid.gov/pdf\\_docs/PNACP702.pdf](http://pdf.usaid.gov/pdf_docs/PNACP702.pdf)

**Abstract:** In this paper, DeGabriele describes multiple ways in which community-based management of boreholes can be improved for sustainability. Based on case studies of community-based projects throughout Malawi, findings suggest that high quality products (such as hand pumps) and consistent management services may contribute to sustainable results. However, the author points to various "unknowns, such as responsibility, commitment, good-will" that may affect the relationship between community and individual management of water supply systems.

#### *Social Marketing*

#### Global

Abt Associates Inc. March 2007. *Best Practices in Social Marketing Safe Water Solution for Household Water Treatment: Lessons Learned from Population Services International Field Programs*. The Social Marketing Plus for Diarrheal Disease Control: Point-of-Use Water Disinfection and Zinc Treatment (POUZN) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNADI479.pdf](http://pdf.usaid.gov/pdf_docs/PNADI479.pdf)

**Abstract:** This resource from the POUZN project documents best practices and lessons learned from the Safe Water System (SWS) strategy implemented across 20 countries that have incorporated social marketing practices and techniques.

## Uganda

Outlaw, Tom; Jenkins, Mimi; and Beth Scott. 2007. *Opportunities for Social Marketing in Uganda*. Academy for International Development, Inc. (AED). Hygiene Improvement Project (HIP). <http://www.hip.watsan.net/page/3517>

**Abstract:** An assessment was carried out by the Hygiene Improvement Project (HIP) in Uganda to examine the feasibility of a sanitation marketing strategy. This paper documents the main results and recommendations based on the assessment. Although the idea of sanitation marketing is fairly new in Uganda, it could be a successful strategy if the following components are achieved: supportive and enabling policy environment; accessible technologies; increased demand for technologies at the household level; and establishing linkages between demand and supply.

## *Technological*

### Global

USAID. 1993. *Guidelines for improving wastewater and solid waste management*. Water and Sanitation for Health (WASH) Project. [http://pdf.usaid.gov/pdf\\_docs/PNABP925.pdf](http://pdf.usaid.gov/pdf_docs/PNABP925.pdf)

**Abstract (from USAID DEC):** "Pollution from wastewater and solid waste is a significant problem for developing countries, especially in urban and peri-urban areas. Unfortunately, these countries lack the financial and institutional resources to manage waste through the combination of advanced technology and strict regulation used by industrialized nations. This report presents a methodology for improving waste management within these limitations. According to the methodology, there are three possible points of intervention: the individuals and institutions responsible for pollution, those responsible for waste management (e.g., environmental resource and water treatment plant managers), and policies and actions to diminish the adverse effects of pollution. Policy and management are assumed to be the primary influences at each of these control points. The methodology has four steps: (1) determining the health, environmental, social, and economic impacts of poor waste management; (2) identifying key groups and institutions whose decisions and actions affect waste management; (3) examining technologies, policy instruments, and institutions (the three key components of any waste management program); and (4) developing, from the best combination of these three components, a strategy for a national program or a project funded by international donors. Such a strategy should be guided by five principles: health risk reduction, pollution prevention by reducing waste at the source or recycling, provision of efficient services, cost recovery from those who benefit, and selection of appropriate treatment and disposal technologies. Appendixes include an annotated bibliography; a technical discussion of the potential impacts of waste; and information on U.S. water quality standards."

USAID. 1992. *Manual: guidelines for water reuse*. Technical Report 81. Water and Sanitation for Health (WASH) Project. [http://pdf.usaid.gov/pdf\\_docs/PNABM586.pdf](http://pdf.usaid.gov/pdf_docs/PNABM586.pdf)

**Abstract (from USAID DEC):** "These guidelines address water reclamation for nonpotable urban, industrial, and agricultural reuse, a subject about which little controversy exists. Also, attention is briefly given to augmentation of potable water supplies via indirect reuse. The guidelines reflect significant technical and institutional developments in water reuse in the United States over the last decade and include consideration of other countries' water reuse needs. Specific topics are as follows: (1) technical issues in planning water reuse (uses, sources, treatment requirements, seasonal storage requirements, and supplemental facilities, including conveyance and

distribution, operational storage, and alternative disposal systems); (2) reuse applications (urban, industrial, agricultural, recreational, habitat restoration/enhancement, groundwater recharge, augmentation of potable supplies, and, very briefly, direct potable use); (3) U.S. state regulations, standards, and guidelines; (4) legal and institutional issues (reuse ordinances, user agreements, water rights, franchise law, and case law); (5) funding and cost recovery options; (6) strategies for educating and involving the public in water reuse planning and reclaimed water use: and (7) reuse systems outside of the U.S. (Author abstract, modified)"

#### Indonesia

USAID. 2006. *Action Research on Point of Use Drinking Water Treatment Alternatives As Appropriate for Underprivileged Households in Jakarta*. Development Alternatives, Inc. (DAI). Environmental Services Program (ESP).

<http://www.esp.or.id/wp-content/uploads/pdf/report/r-0181-pouwater.pdf>

**Abstract:** In Indonesia, a research study was conducted to examine alternative options for point-of-use drinking water treatment. Some of the technologies up for consideration included boiling, chlorination, and ceramic filtration. After pilot studies of these alternatives, campaigns were carried out and participants ranked their preferences. This report describes this process and recommendations for appropriate technologies.

#### Philippines

Bowyer, Jeffrey. 2007. *Septage management in the Philippines: current practices and lessons learned*. Development Alternatives, Inc. (DAI). Philippine Environmental Governance 2 Project (ECOGOV2)

[http://pdf.usaid.gov/pdf\\_docs/PNADL683.pdf](http://pdf.usaid.gov/pdf_docs/PNADL683.pdf)

**Abstract:** The Philippines have gathered lessons learned from Indonesia's experiences with policy reform and localization of wastewater treatment to develop its first septage system in the country. Among the key elements for successful implementation is public awareness building of wastewater pollution and effective coordination among governing bodies at local and national levels as well as the private sector.

### **IV. Environmental Health Studies**

#### *West Bank*

Sha'Ar, Ali; Kelly, Patrick; and Eckhard Kleinau. 2003. *USAID village water and sanitation program, West Bank of Palestine: environmental health assessment, phase II*. Save the Children and Camp Dresser and McKee, Inc. (CDM). Environmental Health Project (EHP).

[http://pdf.usaid.gov/pdf\\_docs/PNACT359.pdf](http://pdf.usaid.gov/pdf_docs/PNACT359.pdf)

**Abstract:** USAID's Environmental Health Project (EHP) conducted a series of environmental health assessments in the West Bank in order to examine seasonal changes in the main project health indicators, and consequences of the social, economic, and political conditions to the project communities. This document reports on the main results of the second phase in EHP's environmental health assessment.

#### *Democratic Republic of Congo*

McGahey, Christopher L. 2001. *Urban environmental health pilot activities: evaluation of progress and lessons learned -- USAID/Democratic Republic of Congo*. Environmental Health Project (EHP).

[http://pdf.usaid.gov/pdf\\_docs/PNACR887.pdf](http://pdf.usaid.gov/pdf_docs/PNACR887.pdf)

**Abstract:** The Urban Environmental Health Program in the Democratic Republic of Congo (DRC) was initiated by USAID/DRC in 2000 to work towards hygiene



improvement for prevention of diarrheal disease. As a result, three pilot programs were implemented that were focused on hygiene improvement. Based on evaluations of these pilot activities, lessons learned for further implementation are documented in this report. Several main recommendations for USAID/DRC reflect the feasibility of these types of environmental health projects in urban areas and the need for creating longer-term, local mechanisms for project operations.

#### *Ethiopia*

Warner, Dennis B.; Green-Abate, Carmela R.; *et al.* 2000. *Water and food-aid in environmentally sustainable development: an environmental study of potable water and sanitation activities within the Title II program in Ethiopia*. International Resources Group, Ltd. (IRG). Winrock International. Harvard University. Harvard Institute for International Development (HIID). Environmental policy & institutional strengthening indefinite quantity contract (EPIQ).

[http://pdf.usaid.gov/pdf\\_docs/PNADI729.pdf](http://pdf.usaid.gov/pdf_docs/PNADI729.pdf)

**Abstract:** This paper presents findings and recommendations from an environmental study to assess the environmental impact of potable water and sanitation activities of USAID's Title II program in Ethiopia.

### **V. Integration of Sanitation into Other Health Programs**

#### *Global*

USAID. [No date available]. *Programming Guidance for Integrating Water, Sanitation, and Hygiene Improvement into HIV/AIDS Programs*. Academy for Educational Development, Inc. (AED). Hygiene Improvement Project (HIP).

<http://www.hip.watsan.net/page/2459>

**Abstract:** This resource serves as a guide for program managers and implementers on ways to integrate specific water, sanitation, and hygiene improvement activities into existing HIV/AIDS home-based care programs. For example, action points on how to provide safe drinking water and how much water is needed in the household should be incorporated into home-based care guidelines for people living with HIV/AIDS (PLWHA) for prevention of diarrheal and other diseases.

USAID. 2007. *Hygiene Improvement and Avian Influenza*. Academy for Educational Development, Inc. (AED). Hygiene Improvement Project (HIP).

<http://www.hip.watsan.net/page/2480>

**Abstract:** This briefing document from the Hygiene Improvement Project (HIP) on hygiene improvement and avian influenza outlines critical hygiene-related recommendations to prevent the further transmission of avian influenza, particularly for health officers, program managers, policy makers, community leaders, and household members.

#### *Democratic Republic of Congo*

Rosensweig, Fred and Ian Moise. 2004. *Developing a hygiene promotion program: summary of assistance to SANRU [Projet de soins de sante primaires en milieu rural] III in the Democratic Republic of the Congo*. Environmental Health Project (EHP).

[http://pdf.usaid.gov/pdf\\_docs/PNACY274.pdf](http://pdf.usaid.gov/pdf_docs/PNACY274.pdf)

**Abstract:** This report presents lessons learned from the Democratic Republic of Congo (DRC) in which hygiene improvement activities were integrated into the community-based integrated management of childhood illnesses (C-IMCI) program to prevent diarrheal diseases. One of the main conclusions from this experience was the usefulness of the hygiene improvement framework for implementation of activities.

### *Ethiopia*

Gebremariam, Kassie; Tekeleselassie, Yilma; Mengesha, Yitayew; Wubneh, Haile; Chaka, Mezgebu; Persell, Peter M.; and Kendra K. Blackett-Dibinga. 2004. *Africare: the Gambella [Ethiopia] child survival project – final evaluation report*. Africare, Inc. USAID PVO child survival grants program (CSGP).

[http://pdf.usaid.gov/pdf\\_docs/PDACA988.pdf](http://pdf.usaid.gov/pdf_docs/PDACA988.pdf)

**Abstract:** The Gambella child survival project in Ethiopia is an example of a successful project with a water and sanitation component to reduce diarrheal and other diseases in the region. Africare's three-pronged approach of community mobilization, capacity building, and monitoring and evaluation increased the participation of community members at all levels, resulting in improved health outcomes.

### *Malawi*

Lockwood, Kathryn; Msapato, Kwame; *et al.* 2006. *Water & sanitation assessment of home-based care clients in Malawi*. Catholic Relief Services (CRS). Institutional Capacity Building Fund (ICB).

[http://pdf.usaid.gov/pdf\\_docs/PNADJ422.pdf](http://pdf.usaid.gov/pdf_docs/PNADJ422.pdf)

**Abstract:** This document reports on an assessment conducted in Malawi on the water, sanitation, and hygiene situation for people living with HIV/AIDS (PLWHAs). Based on the findings of the assessment, future activities for integrating water, sanitation, and hygiene activities into home-based care programs for PLWHAs are outlined.

### *El Salvador*

Lundgren, Rebecka and Margarita de Monroy. 2006. *Strategies for integrating the standard days method into community water and sanitation projects -- increasing the participation of men in family planning programs: final report from El Salvador*. Georgetown University. Institute for Reproductive Health. Natural family planning and reproductive health awareness (AWARENESS)

[http://pdf.usaid.gov/pdf\\_docs/PNADG778.pdf](http://pdf.usaid.gov/pdf_docs/PNADG778.pdf)

**Abstract:** In conjunction with Project Concern International, the AWARENESS project sought to incorporate family planning activities into an existing water and sanitation project in El Salvador as a way to promote the relationship between population growth and resources such as water and land. This paper presents the main outcomes of the integrated intervention, in which family planning education and services were successfully introduced into current water and sanitation activities.

## **VI. Financing for Sanitation**

### *Global*

USAID. 2003. *Innovations and solutions for financing water and sanitation investments*. Planning and Development Collaborative International, Inc. (PADCO).

[http://pdf.usaid.gov/pdf\\_docs/PNACT234.pdf](http://pdf.usaid.gov/pdf_docs/PNACT234.pdf)

**Abstract:** In this document, various strategies and approaches for financing water and sanitation programs from around the world are presented. It offers a list of criteria for an effective finance system and recommendations for supporting sustainable financial solutions for water and sanitation activities.

USAID. 1993. *Financing wastewater services in developing countries*. Technical Report 80. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNABQ370.pdf](http://pdf.usaid.gov/pdf_docs/PNABQ370.pdf)

**Abstract (From USAID DEC):** “Recently, central governments in many developing countries have found it easy to obtain financial and technical assistance for water system construction. Rising urban demand for clean water, combined with health and environmental concerns, have spurred donor agencies to fund water projects, usually based on U.S. models. However, two important aspects of expanded water services have received less attention: treatment and disposal of the higher quantities of wastewater that result; and financing mechanisms for operations and maintenance, and capital investment in the wastewater sector. This report provides information about current wastewater financing practices in both industrialized and developing countries. Although more comprehensive data are available from models in the United States, the Korean and French cases provide a broader basis for comparing policy and regulatory climates, detecting trends in decentralization, and evaluating the feasibility of sectoral financial autonomy. These case studies provide three quite different approaches to the sector. The United States is a completely decentralized model in which the central government's role has been confined to financing and broad regulation of the water sector. Furthermore, the last 20 years have seen wide swings in the level of central government subsidy to the water sector, as well as some recent innovations such as revolving funds at the state level to leverage grant funds through borrowing in the private capital markets. France provides a case example that combines the European River Basin Authority model with municipal ownership of water supply and sanitation systems and heavy reliance on private firms to manage the systems under long-term contracts. Korea provides an example of a country that is decentralizing authority for the wastewater sector and also greatly increasing overall capital investment, while shifting the burden of cost recovery to users. These case studies support several contentions. (1) It is unlikely that user tariffs can finance all wastewater costs, even in industrial countries. (2) Long-term subsidization of infrastructure financing for the wastewater sector leads to less efficient use of resources and displacement of private and local sources of capital. (3) Demonstrating the linkage between water usage and sewage disposal (and pollution control costs) tends to increase sector revenues, promote water conservation, and improve public management of resources. (4) Beneficiary charges, pollution control legislation, and environmental education are effective ways to influence consumer attitudes concerning the real costs of wastewater collection and treatment. Wastewater finance cannot be treated in isolation from water supply, nor can it be separated from the larger issue of municipal infrastructure finance, given that local governments will play an increasingly important role in both cost recovery and assumption of the growing debt burden. A trend toward decentralizing responsibility for financing at least a portion of sanitation capital investment is evident in both industrialized and developing countries. Some privatization of service delivery is also occurring as a way to increase efficiency through better management and use of resources. Ultimately, developing countries will need to evaluate past and current practices in the water and sanitation sectors in order to develop efficient and equitable strategies for serving expanding populations with fewer resources. (Author abstract).”

USAID. 1993. *Helping communities manage their water finances: a manual for extension personnel working in rural or peri-urban communities*. Technical report 93. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNABP926.pdf](http://pdf.usaid.gov/pdf_docs/PNABP926.pdf)

**Abstract (from USAID DEC):** “This manual is intended to demystify financial management issues which hinder extension staff in the effective training of rural communities in water management. The concepts and the training approach presented here may also be relevant to peri-urban contexts, (i.e., marginal neighborhoods on the periphery of large cities). In rural settings, the capital investment in water systems is usually provided by a governmental unit or an NGO. The degree to which communities are required to share the costs varies greatly from place to place. Those costs which communities are requested to carry are sometimes covered through tariffs or special

charges. Where the manual is applied to peri-urban settings, its use must be carefully monitored. Technologies used in peri-urban areas are more complex those used in rural communities because of poor land or difficult terrain on which housing is built -- financing these complex technologies often requires substantial inputs from municipal water utilities. This manual was developed to help extension agents carry out their jobs as advisors, troubleshooters, and on-the-job trainers to treasurers and water committees in both rural or urban communities. To help communities make financial decisions, the manual outlines information to be collected and provides a process to help communities assess whether or not they can afford to own and maintain improved water supplies. Guidance is given for establishing household rates, for appointing an individual who will keep the money, and for collecting and accounting for funds. In most cases, the extension agent will work with the committee treasurer, although frequently the committee president will also be involved. The manual also outlines the processes by which water committee treasurers can perform their tasks. The steps for creating budgets include defining the anticipated expenses; breaking down expenses into categories and monthly outflow; defining the anticipated income; breaking down income into categories and monthly inflow; and raising funds as necessary through community activities. To strengthen the capabilities of extension staff or promoters, the manual includes exercises for practicing the newly acquired skills. Sample budget worksheets and sample ledger worksheets are provided in addition to a glossary of financial terms. (Author abstract, modified)"

USAID. 1992. *Maximizing the economic impact of urban water supply and sanitation investments*. Technical Report 82. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNABN083.pdf](http://pdf.usaid.gov/pdf_docs/PNABN083.pdf)

**Abstract (from USAID DEC):** "This report identifies the economic gains from investments in water supply and sanitation (WS&S) and describes the conditions under which these investments yield economic improvement at the firm, industry, and national levels in developing countries. It is intended to provide planners with guidelines for making informed investment decisions. It reviews empirical evidence that suggest WS&S investments contribute to increased national income, explains the conditions in which this is more likely to occur, and offers a document for use by project design and policy personnel in A.I.D. (and other donor agencies) and developing country planning and budget institutions. The report describes four sources of direct economic gains from investments in water supply at the firm, market, and national levels: increased efficiency and production of the water supply itself; increased production of all goods and services; increased private investment triggered by a public investment in water supply; and increased job creation and employment. Economic theory suggests that if investments in water and sanitation lead to lower input costs, firms using these services will respond with some combination of expanded production and employment, reduced prices, and investment of savings in other economic activities. Lower costs of production also may encourage the expansion of existing industries and the emergence of new ones. Economies of scale, density economies, and technical efficiency improvements are the mechanisms to lower production costs of water and sanitation services. These gains either are passed on to the purchasers of WS&S services or are retained by the WS&S producer for expanding production or investing in other economic opportunities. Gains at the firm and industry levels ultimately translate into increased production and income at the national level. Water supply investment is likely to bring the greatest return where small distribution systems can be expanded, without exceeding current production capacity, to cover a broader geographic area serving existing and potential commercial and industrial users in urban and peri-urban centers. Smaller systems are likely to achieve economies of scale when the distribution network expands. WS&S systems can most easily realize economies of density in urban and peri-urban centers. Technically inefficient systems are the best candidates for investments to increase the quality and quantity of water. Key factors in the investment decision are the volume of water used in

production by existing firms, the likelihood of high-volume users locating in the area, the current price and quality of alternative supplies, and the size and location of the market for additional goods to be produced. (Author abstract)"

#### *West Bank*

USAID. 2002. *Village water and sanitation program: institutional and financial assessment study for establishing joint services councils (JSC) within selected communities in Nablus and Hebron governorates*. American Near East Refugee Aid (ANERA). Environmental Health Project (EHP). [http://pdf.usaid.gov/pdf\\_docs/PNACX985.pdf](http://pdf.usaid.gov/pdf_docs/PNACX985.pdf)

**Abstract:** As part of the Environmental Health Project (EHP), this study was conducted to determine the feasibility of setting up a Joint Services Councils (JSC) for water and sanitation services in Nablus and Hebron governorates of the West Bank. The study found strong support from village councils, governorate representatives, and ministry agencies in the creation of a JSC. However, there was no wastewater collection system in selected villages of the target areas.

#### *India*

USAID. 2003. *Pooled finance model for water and sanitation projects: the Tamil Nadu*. [FIRE(D) project] note, no. 31. Water and Sanitation Pooled Fund (WSPF). TCG International, LLC. Planning and Development Collaborative International, Inc. (PADCO). Financial institutions reform and expansion: debt market component (FIRE (D)). [http://pdf.usaid.gov/pdf\\_docs/PNACT334.pdf](http://pdf.usaid.gov/pdf_docs/PNACT334.pdf)

**Abstract:** Under the FIRE(D) project in Tamil Nadu, India, a pooled financing system was initiated for 14 small- and medium-sized towns in conjunction with the state's Water and Sanitation Pooled Fund. This paper outlines the rationale, goals, process, and achievements of this type of finance mechanism to support water and sanitation projects.

#### *Indonesia*

USAID. 2006. *Micro-credit Finance of Water Connections to New PDAM Customers Assessment Study Cooperation between PDAM Tanah Datar and Bank Rakyat Indonesia*. Development Alternatives, Inc. (DAI). Environmental Services Program (ESP). <http://www.esp.or.id/wp-content/uploads/2007/09/r-0084-micro-credit-finance-of-water-connections.pdf>

**Abstract:** This report outlines the process for partnership between a public water supply company (PDAM Tanah Datar) and a commercial bank (P.T. Bank Rakyat Indonesia) in Indonesia in order to support micro-credit financing for water and sanitation services.

## **VII. Sanitation and Public-Private Partnerships**

#### *Global*

USAID. 1993. *Preparing for private sector participation in the provision of water supply and sanitation services*. Technical Report 84. Water and Sanitation for Health (WASH) Project. [http://pdf.usaid.gov/pdf\\_docs/PNABP924.pdf](http://pdf.usaid.gov/pdf_docs/PNABP924.pdf)

**Abstract (from USAID DEC):** "National and municipal governments in many developing countries are turning more and more to the private sector to supply the capital and management needed to expand services and extend infrastructure. These efforts have been more successful in the power, telecommunications, and transportation sectors than in the water and sanitation sector. Roth points out that "of all public services, the provision of piped water is the one with which the private sector is least involved... It may not be a coincidence that water is also the sector that, in many countries, seems to have the greatest problems."

One difficulty arises from fact that since water and sanitation are natural monopolies tending to become more efficient as they grow larger, the arguments for economies of scale leave little scope for competition among private suppliers of public services. After all, it is competition that provides the incentive for private companies to maintain quality and minimize costs. Another problem is that governments are reluctant to relinquish day-to-day control of projects deemed vital to public health and welfare. Doing so requires a strong regulatory oversight, a role to which governments may not be accustomed. This report is designed to assist developing governments and international donor agencies in overcoming these and other obstacles to increased private sector participation in the water and sanitation sector. It is intended for policy makers in public sector institutions and their advisers who are contemplating comprehensive and formal arrangements with the private sector. Private sector participation is likely to be viewed as one option in an overall plan to improve the sector's performance. This report outlines the most common forms of private sector participation: service and management contracts; short- and long-term leasing arrangements; and investments in build, operate, and transfer (BOT) projects, or build, operate, and own (BOO) projects. The report also discusses divestiture. Service and management contracts are the simplest to implement. Under a service contract, a private firm agrees to provide such services as meter reading, billing, or collection. Under a management contract, a contractor assumes complete responsibility for operation and maintenance of the system. Under a leasing contract, a private firm rents facilities from a public authority, assumes responsibility for operation and maintenance, and finances the replacement of some capital equipment. Under a BOT arrangement, a private firm finances the construction of a plant or system, operates it for a specific number of years, and then transfers ownership to a public agency. (Author abstract)"

#### *Central America*

Saade, Camille; Bateman, Masee; and Diane B. Bendahmane. 2001. *Story of a successful public-private partnership in Central America: handwashing for diarrheal disease prevention. Partnership for Child Health Care, Inc. Camp Dresser and McKee, Inc. (CDM). U.N. Children's Fund (UNICEF). World Bank (IBRD). Basic Support for Institutionalizing Child Survival (BASICS) and Environmental Health Project (EHP).*  
[http://pdf.usaid.gov/pdf\\_docs/PNACQ727.pdf](http://pdf.usaid.gov/pdf_docs/PNACQ727.pdf)

**Abstract:** The authors of this paper present a successful model for establishing a public-private partnership as part of the Central American Handwashing Initiative to reduce diarrheal disease in Guatemala, Costa Rica, El Salvador, Honduras, and Nicaragua. Working with commercial soap producers, handwashing education and awareness campaigns were launched in 1998. The main successful elements identified by the authors are: facilitation from a "catalyst"; behavioral research (market survey); public health support; well-defined strategy; and clear roles and expectations of all partners.

#### *Nepal*

Delafield, Sylvia. 2004. *Planning tools for the Nepal public-private partnership for handwashing initiative.* Environmental Health Project (EHP).  
[http://pdf.usaid.gov/pdf\\_docs/PNACW829.pdf](http://pdf.usaid.gov/pdf_docs/PNACW829.pdf)

**Abstract:** This resource contains a series of planning tools for program managers that were used in developing and implementing the initial activities of the Nepal Handwashing with Soap Initiative. Based on a desk review of the Central American Handwashing Initiative and other relevant resources, these planning tools include useful documents such as "request for proposal," "draft research plan," and "research firm selection form."

## VIII. Sanitation and Capacity Building

### *Global*

USAID. 1993. *Lessons learned in water, sanitation and health: thirteen years of experience in developing countries*. Water and Sanitation for Health (WASH) Project.  
[http://www.ehproject.org/PDF/ehkm/wash-lessons\\_learned1993.pdf](http://www.ehproject.org/PDF/ehkm/wash-lessons_learned1993.pdf)

**Abstract (from USAID DEC):** “Twenty lessons learned from the 13 years (1980-1993) of field work in the Water and Sanitation for Health (WASH) project are distilled in this report. In regard to TA, WASH teaches that: effective TA focuses on building local institutions by transferring sustainable skills; an active information service can expand the reach of TA; and, TA in water supply and sanitation (WS&S) requires an approach that is interdisciplinary and participatory, and the collaboration of donor agencies. Lessons concerning shared responsibility are that: government’s role is to assume responsibility for overall sector management, that of donors to support the government’s national plans; NGOs can operate effectively in local situations inaccessible to donors; user participation in WS&S management is critical to sustainability; expansion of the private sector’s role depends on a supportive legal and policy environment. Lessons regarding program strategies are: the success of individual projects depends on strong sectoral policies and institutional practices; sanitation should be accorded the same priority as water supply; improvements in hygiene are an indispensable measure of success for WS&S activities; national governments must take specific policy steps to empower communities to manage WS&S efforts; a participatory approach to planning helps forge linkages beyond the sector; and, the traditional command and control model for WS&S regulation is generally inappropriate. Lessons for sustainability are that: successful institutional and human resource development projects are comprehensive, systematic, participatory, and based on long-term planning; sustainability of WS&S systems requires full consideration of appropriate engineering design and application, planning of operations and maintenance functions prior to construction to ensure that the technologies selected are sustainable, and an appropriate mix of donor, government, and community resources.”

### *Latin America and the Caribbean*

Rosensweig, Fred and Eduardo Perez (with Jeanine Corvetto and Scott Tobias). 2002. *Improving Sanitation in Small Towns in Latin America and the Caribbean: Practical Methodology for Designing a Sustainable Sanitation Plan*. Environmental Health Project (EHP).  
[http://pdf.usaid.gov/pdf\\_docs/PNACQ354.pdf](http://pdf.usaid.gov/pdf_docs/PNACQ354.pdf)

**Abstract:** This paper outlines the process for a participatory method used to develop a sustainable sanitation plan for small towns in Panama, Jamaica, and Ecuador. The first section contains a general summary of the current situation of sanitation in Latin America and the Caribbean. In the following section, the ten steps of the participatory methodology are discussed in detail.

### *Indonesia*

USAID. 2005. *Certification and training for network improvement project (CATNIP): a best practices case study – Indonesia*. Louis Berger Group, Inc. United States-Asia environmental partnership (US-AEP).  
[http://pdf.usaid.gov/pdf\\_docs/PNADF101.pdf](http://pdf.usaid.gov/pdf_docs/PNADF101.pdf)

**Abstract:** This case study from Indonesia features a pilot project called the Certification and Training for Network Improvement Project (CATNIP) for improved delivery of clean and potable water through household taps, reaching targeted community members. After 11 months of implementation, the CATNIP initiative supported three zones of drinking water to 2,300 people, and improved its water management capabilities.

## IX. Sanitation in Urban Populations

USAID. 1993. *Constraints in Providing Water and Sanitation Services to the Urban Poor*. Technical Report 85. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNABN953.pdf](http://pdf.usaid.gov/pdf_docs/PNABN953.pdf)

**Abstract (from USAID DEC):** "Provision of water and sanitation to informal Third World urban settlements can be extremely difficult, due to a range of constraints -- physical, technical, financial, institutional, and most of all, structural. Physical and technical constraints arise because the urban poor tend to settle on the most undesirable pieces of land for economic reasons. Ironically, where the cost of land goes down, the cost of bringing in services goes up. Also, informal settlements often develop haphazardly, without adequate space for installing infrastructure lines, and local engineers prefer to use service delivery modes with which they are familiar, even when these turn out to be inappropriate for the difficult topography, soils, and other conditions of slum neighborhoods. Financial constraints include both the high costs of connections in or near the house and the shortage of capital for investment. Attempts to get independent banks to finance slum upgrades have been widely unsuccessful. The major institutional constraints are ineffective public works companies. Typically, public works companies lack motivation to deliver quality services to marginal areas; nor have private service companies shown eagerness to extend infrastructure to poor neighborhoods. Structural constraints -- those involving zoning, land-use planning, land markets, building codes, and property rights -- are the most difficult to address, let alone resolve, because they involve conflicting values and policy viewpoints. The present policy of many international agencies to emphasize private sector growth over social development may present a new barrier in getting services to the poor. The greatest bottleneck, however, is indifference and even hostility, at local, national, and international levels. (Author abstract, modified)"

USAID. 1993. *The Unique Challenges of Improving Peri-Urban Sanitation*. Technical Report 86. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/pnabp615.pdf](http://pdf.usaid.gov/pdf_docs/pnabp615.pdf)

**Abstract (from USAID DEC):** "This document is intended to be an informational tool that helps project designers better understand and confront the problems in improving sanitation in peri-urban areas. It is not meant to be a technical design manual, nor is it a comprehensive reference document on existing technologies. The ultimate goals of the report are to provide the reader with some key questions to ask, with information to gather as part of the planning and design process, and with suggestions about what basic approach to follow in setting up peri-urban sanitation projects. Peri-urban areas present unique challenges to sanitation improvement activities. Most challenging are the characteristics that set these areas apart from the urban and rural sectors: poor site conditions, unreliable water availability, high population density, the heterogeneous nature of the population, and the lack of legal land tenure. These characteristics are much more complex than those typifying rural and formal urban areas. The "standard" technical and social solutions for low-cost sanitation currently used in rural communities are not necessarily appropriate for improving community sanitation in peri-urban areas. Conventionally, most community sanitation problem assessments and project design efforts focus on the technical feasibility of intervention options. Experience suggests that these technology intervention projects often fail to meet their objectives. The report suggests that the complexities of peri-urban settlements required that a more comprehensive interdisciplinary approach be used to clarify the problem before attempting to design a project that will address peri-urban community sanitation needs. This document reviews the key public health, environmental, social, financial, economic, legal, and institutional issues that many of these settlements face and must be understood before developing a program designed to improve a peri-urban community's sanitation services. To address these problems, the project designer must deal not only



with engineers but also with legal specialists, financial analysts, social scientists, urban planners, and a wide range of institutions, such as the water and sanitation utility, the Ministry of Health, urban development authority, and the municipality. The document should be particularly useful for those project officers in A.I.D. and other international organizations who come to the urban sector with "generalist" experience, or with previous experience in providing water and sanitation in their developed countries or in rural areas of less developed countries. The paper also should be helpful for technical specialists who assist with project development, particularly in ensuring that they become aware of issues in a wide range of subject areas other than their specialty. The sanitation challenges peri-urban areas present are unique, and they demand that difficulties in providing appropriate excreta disposal systems be confronted head-on. In some "impossible situations," no technical solution will prove viable. To create new solutions, project leaders must challenge the status quo at the municipal and national levels of developing countries, which continue to deal with urban sanitation in a conventional way. By necessity or choice, in the foreseeable future, government institutions, bilateral and multilateral aid organizations, the engineering sector, and NGOs, all will be compelled to shift more of their attention and resources to the sanitation needs of peri-urban populations. (Author abstract)"

## **X. Links to Additional WASH Project Resources**

This section contains links to other useful WASH Project documents, including technical reports and regional- and country-specific resources.

### *Global*

USAID. 1994. *Making Interdisciplinary Teams Work: A Guide for Team Leaders and Technical Assistance Managers*. Technical Report 94. Water and Sanitation for Health (WASH) Project. [http://pdf.usaid.gov/pdf\\_docs/pnabq780.pdf](http://pdf.usaid.gov/pdf_docs/pnabq780.pdf)

USAID. 1994. *Sustainability of donor-assisted rural water supply projects*. Technical Report 94. Water and Sanitation for Health (WASH) Project. [http://pdf.usaid.gov/pdf\\_docs/PNABQ942.pdf](http://pdf.usaid.gov/pdf_docs/PNABQ942.pdf)

USAID. 1993. *Conducting a Team Planning Meeting for Studies and Concept Development Tasks: Facilitator's Guide*. Technical Report 87. Water and Sanitation for Health (WASH) Project. [http://pdf.usaid.gov/pdf\\_docs/pnabn928.pdf](http://pdf.usaid.gov/pdf_docs/pnabn928.pdf)

USAID. 1992. *Economic benefits available from the provision of improved potable water supplies: a review and assessment of the existing evidence*. Technical Report 77. Water and Sanitation for Health (WASH) Project. [http://pdf.usaid.gov/pdf\\_docs/PNABN462.pdf](http://pdf.usaid.gov/pdf_docs/PNABN462.pdf)

USAID. 1991. *Workshop design for the training of trainers*. Technical Report 73. Water and Sanitation for Health (WASH) Project. [http://pdf.usaid.gov/pdf\\_docs/PNABI540.pdf](http://pdf.usaid.gov/pdf_docs/PNABI540.pdf)

USAID. 1991. *Cost-of-illness methodologies for water-related diseases in developing countries*. Water and Sanitation for Health (WASH) Project. [http://pdf.usaid.gov/pdf\\_docs/PNABJ866.pdf](http://pdf.usaid.gov/pdf_docs/PNABJ866.pdf)

USAID. 1990. *Guidelines for conducting a financial management assessment of water authorities*. Technical Report 53. Water and Sanitation for Health (WASH) Project. [http://pdf.usaid.gov/pdf\\_docs/PNABX990.pdf](http://pdf.usaid.gov/pdf_docs/PNABX990.pdf)

USAID. 1990. *Health benefits from improvements in water supply and sanitation: survey and analysis of the literature on selected diseases*. Technical Report 66. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNABG658.pdf](http://pdf.usaid.gov/pdf_docs/PNABG658.pdf)

USAID. 1989. *Estimating operations and maintenance costs for water supply systems in developing countries*. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNABB776.pdf](http://pdf.usaid.gov/pdf_docs/PNABB776.pdf)

USAID. 1988. *Facilitator Guide for Conducting a Project Start-Up Workshop*. Technical Report 41. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/pnaaz424.pdf](http://pdf.usaid.gov/pdf_docs/pnaaz424.pdf)

USAID. 1988. *Managing institutional development projects: water and sanitation sector*. Technical Report 49. Water and Sanitation for Health (WASH) Project

[http://pdf.usaid.gov/pdf\\_docs/PNAAZ920.pdf](http://pdf.usaid.gov/pdf_docs/PNAAZ920.pdf)

USAID. 1985. *Facilitator Guide for Conducting a Team Planning Meeting*. Technical Report 32. Water and Sanitation for Health (WASH) Project

[http://pdf.usaid.gov/pdf\\_docs/PNAAU017.pdf](http://pdf.usaid.gov/pdf_docs/PNAAU017.pdf)

*Technical Reports*

USAID. 1993. *Community sanitation improvement and latrine construction program: a training guide*. Technical Report 83. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNABN929.pdf](http://pdf.usaid.gov/pdf_docs/PNABN929.pdf)

USAID. 1992. *Institutionalizing community management: processes for scaling up*. Technical Report 76. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNABK882.pdf](http://pdf.usaid.gov/pdf_docs/PNABK882.pdf)

USAID. 1992. *Cholera prevention and control: guidelines for assessing the options in water supply, sanitation and hygiene education*. Field Report 380. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNACA703.pdf](http://pdf.usaid.gov/pdf_docs/PNACA703.pdf)

USAID. 1992. *Rethinking sanitation: adding behavioral change to the project mix*. Technical Report 72. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNABL701.pdf](http://pdf.usaid.gov/pdf_docs/PNABL701.pdf)

USAID. 1988. *Human resource development planning: guidelines for the water supply and sanitation sector*. Technical Report 20. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNABA420.pdf](http://pdf.usaid.gov/pdf_docs/PNABA420.pdf)

USAID. 1981. *Role of women as participants and beneficiaries in water supply and sanitation programs*. Technical Report 11. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNAAL379.pdf](http://pdf.usaid.gov/pdf_docs/PNAAL379.pdf)

USAID. 1981. *Women, water and the decade*. Technical Report 6. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNAAN118.pdf](http://pdf.usaid.gov/pdf_docs/PNAAN118.pdf)

USAID. 1981. *Evaluation methods for community rural water supply and sanitation projects in developing countries: a synthesis of available information*. Water and Sanitation for Health (WASH) Project.

[http://pdf.usaid.gov/pdf\\_docs/PNAAT110.pdf](http://pdf.usaid.gov/pdf_docs/PNAAT110.pdf)

USAID. 1991. *Principles of tariff design for water and wastewater services*. Field Report 348. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNABJ655.pdf](http://pdf.usaid.gov/pdf_docs/PNABJ655.pdf)

USAID. 1990. Programming guide for guinea worm eradication. Field Report 329. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNACA736.pdf](http://pdf.usaid.gov/pdf_docs/PNACA736.pdf)

USAID. 1988. Guidelines for conducting willingness-to-pay studies for improved water services in developing countries. Field Report 306. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNABK145.pdf](http://pdf.usaid.gov/pdf_docs/PNABK145.pdf)

#### *Africa*

USAID. 1994. Senegal River Basin health master plan study. Field Report 453. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNABW752.pdf](http://pdf.usaid.gov/pdf_docs/PNABW752.pdf)

USAID. 1993. Comparison of the health effects of water supply and sanitation in urban and rural areas of five African countries. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNACA705.pdf](http://pdf.usaid.gov/pdf_docs/PNACA705.pdf)

USAID. 1989. Strategy recommendations for water supply and sanitation in Africa. Field Report 290. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNACA733.pdf](http://pdf.usaid.gov/pdf_docs/PNACA733.pdf)

USAID. *Developing sustainable community water supply systems: key questions for African Development Foundation applicants*. Field Report 270. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNACA731.pdf](http://pdf.usaid.gov/pdf_docs/PNACA731.pdf)

USAID. 1989. *Water and sanitation sector profiles of twenty African countries*. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNABK437.pdf](http://pdf.usaid.gov/pdf_docs/PNABK437.pdf)

#### *Asia/Near East*

USAID. 1989. *Rural water supply, sanitation, and environmental issues in Asia and the Near East (ANE)*. Field Report 282. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNABQ943.pdf](http://pdf.usaid.gov/pdf_docs/PNABQ943.pdf)

#### *Eastern Europe*

USAID. 1993. *Water quality pre-investment studies in four Danube River tributary basins: summary report*. Field Report 407. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNABP857.pdf](http://pdf.usaid.gov/pdf_docs/PNABP857.pdf)

#### *Ecuador*

USAID. 1993. *Environmental health assessment: a case study conducted in the City of Quito and the country of Pedro Moncayo, Pichincha Province, Ecuador*. Field Report 401. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNABR079.pdf](http://pdf.usaid.gov/pdf_docs/PNABR079.pdf)

#### *Guatemala*

USAID. 1991. *Comparison of the health effects of water supply and sanitation in urban and rural Guatemala*. Field Report 352. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNABK608.pdf](http://pdf.usaid.gov/pdf_docs/PNABK608.pdf)

#### *Jamaica*

USAID. 1992. *Management analysis and privatization options of the National Water Commission, Jamaica*. Field Report 361. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNABL654.pdf](http://pdf.usaid.gov/pdf_docs/PNABL654.pdf)

#### *Jordan*

USAID. 1988. *Water and wastewater sector assessment in Jordan*. Field Report 244. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNABB164.pdf](http://pdf.usaid.gov/pdf_docs/PNABB164.pdf)

USAID. 1982. *Proposed action plan for a national training program in the water sector for the Hashemite Kingdom of Jordan*. Field Report 34. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNAAL368.pdf](http://pdf.usaid.gov/pdf_docs/PNAAL368.pdf)

#### *Tanzania*

USAID. 1982. *Environmental sanitation master plan for training and education in Tanzania*. Field Report 58. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNAAL647.pdf](http://pdf.usaid.gov/pdf_docs/PNAAL647.pdf)

USAID. 1982 - *Environmental sanitation master plan for training and education in Tanzania*. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNAAL647.pdf](http://pdf.usaid.gov/pdf_docs/PNAAL647.pdf)

#### *Tunisia*

USAID. 1990. *Action plan: development of the national strategy to create and monitor water user associations in Tunisia*. Field Report 300. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNABF033.pdf](http://pdf.usaid.gov/pdf_docs/PNABF033.pdf)

USAID. 1990. *Re-examination of costs and benefits of rural water supply projects in Central Tunisia*. Field Report 298. Water and Sanitation for Health (WASH) Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNACA734.pdf](http://pdf.usaid.gov/pdf_docs/PNACA734.pdf)

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