Global Sanitation Service Chain Technology Manual

An analysis of sanitation technology innovations

INTRODUCTION TO THE SANITATION SERVICE DELIVERY PROGRAM

The Sanitation Service Delivery (SSD) Program in West Africa is a USAID-funded five-year cooperative agreement with Population Services International (PSI), PATH, and Water & Sanitation for the Urban Poor (WSUP). The goal of the SSD project is to improve urban sanitation outcomes through developing scalable, market-based models that contribute to structural change within the region's sanitation sector with an initial focus on the cities of Cotonou (Benin), Abidjan (CDI), and Accra and Kumasi (Ghana).

PATH's role in the SSD project is to apply its expertise in product development and finance to accelerate market-based solutions and build partner capacity. PATH's product development activities are designed to support the development of new business models and the scaling of appropriate and affordable sanitation solutions in Benin, Côte d'Ivoire, and Ghana.

PURPOSE OF THE GLOBAL SANITATION SERVICE CHAIN TECHNOLOGY TOOLS

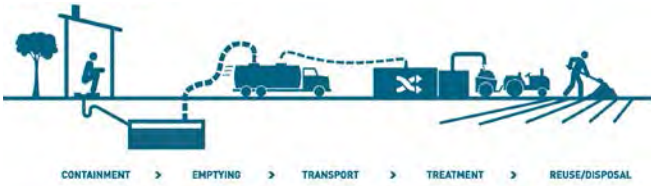
The Global Sanitation Service Chain Technology tools include the Technology Filter and Technology Profile. Both tools contain the same list of technologies, although each tool has a distinct functional purpose. The Technology Filter is interactive and used to identify a list of appropriate technologies. The Technology Profile can be used to gather more information on the technologies.

The most recent version of each tool can be found on the PATH website at www.path.org/publications/detail.php?i=2651.

TOOL STRUCTURE

The structure of the Global Sanitation Service Chain Technology Filter and Technology Profile are identical, to provide clarity and allow the user to more easily move between the two. PATH used the widely-accepted sanitation service chain framework developed by a leading WASH-sector research institution, the Swiss Federal Institute of Aquatic Science and Technology (Eawag), to organize the technologies into each of the five functional groups of the sanitation service chain: user interface, storage and containment, conveyance, treatment, and treatment and/or disposal.

SANITATION VALUE GRAPHIC



Bill & Melinda Gates Foundation

TOOLS AND HOW TO APPLY THEM

Tips for using the Global Sanitation Service Chain Technology tools:

- Introduction tab: Provides background, purpose, and key definitions.
- Header: Located at the top of the rows, the headers indicate what functional group the user is in.
- Transition arrows: Located at the top of the tool, the transition arrows move the user between functional groups.

Global Sanitation Service Chain Technology Filter

The Global Sanitation Service Chain Technology Filter is an interactive tool to identify appropriate sanitation technologies based on social, technical, and business questions. The guiding questions are listed diagonally at the top of each tab and are color coded to indicate whether they are social (white), technical (gray), or business (dark gray) aspects of the design. The a black column at the end of the interactive questions called "Proceed to:" direct the user to the next functional group.

In some functional groups, additional guiding questions are provided to the right of the black column. These questions have been left out of the filtering tool as they cannot be answered in a general format. However, to further determine the appropriateness of a technology, they can be answered by the user. The answers can be noted in the blank cells provided.

How to Use the Technology Filter

The user selects answers to the questions at the top of each functional group by using the filtering arrow. The filtering arrow is located within each question cell. Answers are selected by clicking the filtering arrow, reviewing the drop-down choices, and selecting all appropriate answers with a check mark. It is important to read the entire question, because it directs the user on how to respond, and in some instances this may mean leaving the answer blank and proceeding onto the next question. If the user does not know the answer to a question, it can be left blank.

After answering all questions possible, only technologies that fulfill the specified criteria will remain. It is possible that there will not a technology that fulfills the criteria specified. If no technologies are listed, the user can expand their search parameters. For example, instead of selecting one answer to a question, check the "select all" box. The user can determine which questions are of highest priority and need to be specified and which questions are not as critical and can be left generalized as "select all". Once the user has a list of technologies generated from the filter, they are encouraged to learn more about the technology in the Global Sanitation Technology Profile.

Sample page from the Global Sanitation Service Chain Technology Filter. Each page guides the user through a series of questions to help identify appropriate technology solutions.

Tips for using the Global Sanitation Service Chain Technology Profile:

- Page organization: Located at the top of the functional group tab, it provides a brief explanation in how the page has been organized.
- Treatment standards: The WHO Treatment Standards for Sterilizing Fecal Sludge Matter is provided at the top of the Treatment tab and specifies permissible levels of pathogens in FS to render it sanitary.
- "Find" function: A specific word can be searched for by either scrolling through the list, or using the "find" function in Excel.

Global Sanitation Service Chain Technology Profile

The Global Sanitation Service Chain Technology Profile serves as a comprehensive, detailed repository for sanitation technologies spanning across the Eawag sanitation service chain chain, including user interface, storage and containment, collection, treatment, and reuse and/or disposal. Its main function is to serve as a glossary for the Global Sanitation Service Chain Technology Filter, and to be used to gain more information about the appropriate technologies identified by the Technology Filter.


BACK TO INTRODUCTION

Global Sanitation Service Chain Technology Profiles
User Interface
September 2016

CONTINUE TO STORAGE & CONTAINMENT

User interface: What toilet or sanitation facility is the user interacting with?
Page Organization: Alphabetically.

Technology	Picture	Description	Development stage	Cost	Location available
Ecological Latrine		Unisex urinal that incentivizes good sanitary habits by allowing its users to capitalize on the urine to be sold as an organic fertilizer for profit.	Commercialized	$0 - $5	Global
Ecosan Pit Toilets - VIP 450,VIP 200		Seated latrine options that can be installed atop a pit. These are not designed to be urine diverting dry toilets (UDDT).	Commercialized	Unavailable	Global
Onji Toilet Bowl		Urine diverting dry toilet (UDDT) option. Urine and feces are separate via a diverting lip on the design of the inner toilet wall. The solids are disposed of in a pit where they proceed to compost, and liquids are diverted to soak field.	Commercialized	Unavailable	Namibia
SaTo Hygenic Toilet		Seated option. All liquids and solids exit down the same chute such as with the SaTo Pan design.	Commercialized	$0 - $5	Global

Sample page from the Global Sanitation Service Chain Technology Profile. Each page provides a visual, description, development stage, cost, location, and reference for each technology.

ADDITIONAL RESOURCES

Implementation models

Table 1 provides information on example implementation models that have successful end-to-end projects in the field. Each model addresses each phase in the sanitation service chain.

Institutional databases

Table 2 identifies institutional databases used in the research and construction of the Global Sanitation Service Chain Technology. They can serve as a source for more information on water and sanitation work in low-resource settings.

CONTACT INFORMATION

Jennifer Foster
Technical Officer, WASH Portfolio
PATH
email: jfoster@path.org

Table 1: Global Implementation Models

Project	Description of implementation activity	Country location	Website
Program for the Structuring of the Fecal Sludge Market (PSMVB)	Structure the onsite sanitation market so that user demand is met at an affordable cost.	Senegal	www.pseau.org/outils/ouvrages/onas_boues_mag_n_4_en_2014.pdf
Fecal sludge management in Maputo	Define and develop a basic level service model for sanitation in per-urban areas not served by a sewage system.	Mozambique	www.wsp.org/sites/wsp.org/files/publications/WSP-Developing-Business-Models-for-Fecal-Sludge-Management-Maputo.pdf
Clean Team	Increase access to acceptable sanitation facilities through rentable portable toilets connected to a collection, treatment, and disposal service system.	Ghana	cleanteamtoilets.com/
X-runner	Sell and install affordable, urine diverting, dry toilets connected to a compost and treatment service.	Peru	xrunner-venture.org/
Wastewater treatment systems by Plan International Pakistan	Develop an integrated rural sanitation system through the increase drainage and wastewater treatment sites through constructed wetlands.	Pakistan	www.susana.org/_resources/documents/default/2-1557-en-susana-cs-pakistan-2011.pdf
Bina Ekonomi Sosial Terpadu (BEST)	Address waste disposal issues through a solid waste removal program through a neighborhood motorbike collection system.	Indonesia	gtps.ampl.or.id/en/index.php?option=com_comprofiler&task=userProfile&user=147
Appolonia Integrrated Rural Energy Project	Biogas installations in Ghana.	Ghana	www.ijee.ieefoundation.org/vol1/issue2/IJEE_06_v1n2.pdf
Excrete and Wastewater Management	Improve fecal sludge collection and transport by strengthening stakeholder capacity and designing an institutional framework.	Burkina Faso	www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/EWM/Sustainable_Implementation/instit_framework_burkina.pdf
Brazilian condominial sewage system	Develop a condominial sewage system for efficient and economic fecal sludge management.	Brazil	www.efm.leeds.ac.uk/CIVE/Sewerage/articles/condominial2.pdf
Eram eToilet	An automated public toilet that can be connected electronically to an eToilet for easy location identification.	Global	www.eramscientific.com/?q=solutions
Organi pilot project	Model to finance, manage, and maintain in-home latrines and underground sewers.	Pakistan	www.oppinstitutions.org/

Project	Description of implementation activity	Country location	Website
MoSan toilet	Affordable, urine diverting toilet, with financing options, that is connected to collection and disposal services.	Bangladesh, Kenya	www.mosanitation.com/
Sanergy model	Design and build low-cost, high-quality sanitation facilities that are connected to collection and disposal services. Service model has ability to be franchised.	Kenya	saner.gy/our-work/the-sanergy-model
Toilets for People	Affordable, composting toilets	Global	toiletsforpeople.com/
SOIL	Increase access to acceptable sanitation facilities through rentable portable toilets connected to a collection, treatment, and disposal service system.	Haiti	www.oursoil.org/
Aquamin Project	Urine diverting sanitation facility connected to a wastewater and biogas recycling treatment plant.	Germany	www.zebistis.ch/index.php?option=com_content&view=article&id=52&Itemid=137
Sanivation	Installs modern container-based toilets for free and charges a small monthly fee for servicing and treatment for reuse.	Kenya	www.sanivation.com/

Table 2: Global water and sanitation databases

Database	Description	Resources	Website
SuSanA	The Sustainable Sanitation Alliance International is an alliance dedicated to understanding viable and sustainable sanitation solutions.	Working groups; Open-source library with over 1,700 publications; data collection tools; online discussions; calendar for global water and sanitation conferences	www.susana.org/en/
EAWAG	A Swiss Federal Institute of Aquatic Science and Technology that includes two universities and four independent research institutions. It is concerned with concepts and technologies related to water resources.	Scientific publications, water news, calendar for global water and sanitation conferences	www.eawag.ch/em/

Database	Description	Resources	Website
BORDA	Bremen Overseas Research and Development Association is a research institution focused on improving the living conditions of disadvantaged communications, while keeping the environment intact. BORDA specifically focuses on decentralized sanitation and waste disposal.	Service packages, publications, external studies and reports, news, calendar for global water and sanitation conferences	www.borda-net.org/
WEDC	Water, Engineering and Development Centre is an education and research institute for developing knowledge and capacity in water and sanitation for low- and middle-income countries.	Open-source library with over 2,000 publications, WEDC conference posters/abstracts, calendar for global water and sanitation conferences	wedc.lboro.ac.uk/index.html
IWA	The International Water Association organizes global policy events that focus on water and wastewater management.	Publications	www.iwa-network.org/
SSWM	The Sustainable Sanitation and Water Management is a resource site that highlights holistic approaches to address the global water and sanitation crisis.	Background, planning and processing, implementation factsheets and presentations.	www.sswm.info/
Akvopedia	An open-source water and sanitation site that seeks to improve water and sanitation project through knowledge exchange.	Tools, news, definitions	https://akvopedia.org/wiki/Main_Page

Cover photo: PATH/Robyn Wilmouth

USAID FROM THE AMERICAN PEOPLE

This study/report is made possible by the support of the American people through the United States Agency for International Development (USAID). The contents are the sole responsibility of PATH and do not necessarily reflect the views of USAID or the United States Government.

PATH

PATH is the leader in global health innovation. An international nonprofit organization, we save lives and improve health, especially among women and children. We accelerate innovation across five platforms—vaccines, drugs, diagnostics, devices, and system and service innovations—that harness our entrepreneurial insight, scientific and public health expertise, and passion for health equity. By mobilizing partners around the world, we take innovation to scale, working alongside countries primarily in Africa and Asia to tackle their greatest health needs. Together, we deliver measurable results that disrupt the cycle of poor health. Learn more at **www.path.org**.

September 2016