

SCALING MARKET-BASED SANITATION

Desk Review on Market-Based Rural Sanitation
Development Programs



FSG

JUNE 2018

This publication was produced for review by the United States Agency for International Development. It was prepared by Tetra Tech.

ACKNOWLEDGEMENTS

This desk review was prepared by FSG. Rishi Agarwal led the analysis with essential participation from Subhash Chennuri and Aaron Mihaly (FSG).

The authors would like to acknowledge the generous contribution and thought partnership of WASHPaLS Deputy Director Dr. Jeff Albert of Aquaya and WASHPaLS Task 2.2.1 Research Advisor Dr. Mimi Jenkins.

The following individuals reviewed this document and provided valuable input to ensure its comprehensiveness and accuracy: Greg Lestikow (iDE), Michael Roberts (iDE), Yi Wei (iDE), Hannah Taukobong (Iris Group, Inc.), Hanh Nguyen (East Meets West), Pritpal Marjara (PSI India), Malva Rosa Baskovich (WSP Peru), Morris Israel (Tetra Tech), Elizabeth Jordan (USAID), Jesse Shapiro (USAID), Ada Oko-Williams (WaterAid), and Geoff Revell (WaterSHED)

The authors would like to thank Laura Amaya, Rivika Bisht, Anantya Chandra, Ishwar Gawande, Vishnu Rajeev, Rahul Singh, and Urmi Uppal (FSG) for their contributions to the review. Kashmira Ranji provided invaluable logistical and other support.

Authors: Rishi Agarwal, Subhash Chennuri, and Aaron Mihaly, FSG

Preferred citation: USAID, 2018. *Scaling Market Based Sanitation: Desk review on market-based rural sanitation development programs*. Washington, DC., USAID Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) Project.

Prepared for the United States Agency for International Development by the Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) project under Task Order number AID-OAA-TO-16-00016 of the Water and Development Indefinite Delivery Indefinite Quantity Contract (WADI), contract number AID-OAA-I-14-00068.

Tetra Tech Contacts: Morris Israel, Project Director
morris.israel@washpals.org

Jeff Albert, Deputy Project Director
jeff.albert@washpals.org

Jonathan Annis, Project Manager
jonathan.annis@tetrattech.com

Tetra Tech
1320 N. Courthouse Road, Suite 600, Arlington VA 22201
Tel: 703-387-2100 Fax: 703-414-5593
www.tetrattech.com/intdev

SCALING MARKET-BASED SANITATION

Desk Review on Market-Based Rural Sanitation Development
Programs

June 2018

DISCLAIMER

The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS	II
GLOSSARY OF TERMS	IV
PREFACE	VII
EXECUTIVE SUMMARY	VIII
1.0 INTRODUCTION	I
2.0 LITERATURE SURVEY	4
2.1 BUSINESS MODELS: TARGET MARKETS, PRODUCT DESIGN, AND COMMERCIALIZATION.....	4
2.2 SANITATION ENTREPRENEURS: AVAILABILITY, VIABILITY, AND SUPPORT	6
2.3 UNLOCKING PUBLIC AND PRIVATE FINANCE FOR MBS	9
3.0 INTERVENTION CASE STUDIES	12
3.1 WHAT DO THE NUMBERS TELL US ABOUT MBS INTERVENTIONS?	14
3.1.1 Top-Level Finding 1: Few “True” MBS interventions have scaled.....	14
3.1.2 Top-Level Finding 2: Among MBS interventions at scale, there is considerable variance in cost to scale	15
3.1.3 Top-Level Finding 3: If funders stay invested, interventions can scale up	15
4.0 THE SANITATION MARKET SYSTEM	17
4.1 BARRIERS TO FUNCTIONING OF THE SANITATION ENTERPRISE	20
4.1.1 Target Market	20
4.1.2 Product System.....	22
4.1.3 Sales and Marketing.....	24
4.1.4 Delivery Model	30
4.2 BARRIERS TO CUSTOMER PARTICIPATION IN SANITATION MARKETS.....	33
4.2.1 Affordability	33
4.2.2 Liquidity	36
4.2.3 Latent Demand	40
4.3 BARRIERS TO ENTREPRENEUR PARTICIPATION IN SANITATION MARKETS.....	41
4.3.1 Viability of sanitation enterprise.....	41
4.3.2 Access to capital for sanitation enterprise.....	42
4.3.3 Availability of entrepreneurs	43
4.4 BUSINESS ENVIRONMENT.....	45
4.5 BROADER CONTEXT FOR MARKET-BASED SANITATION	47
5.0 MONITORING, LEARNING, AND EVALUATION	49
6.0 CONCLUSIONS	54
6.1 GUIDANCE FOR SANITATION FUNDERS.....	54
6.2 GUIDANCE FOR IMPLEMENTERS	56
6.3 GUIDANCE FOR GOVERNMENTS	59
7.0 AREAS FOR FURTHER RESEARCH	61
ANNEX 1: METHODOLOGY FOR THE LITERATURE SURVEY	64
ANNEX 2: METHODOLOGY FOR INTERVENTION CASE STUDY SELECTION.....	67
ANNEX 3: INTERVENTION ANALYSIS.....	72
ANNEX 4: ACKNOWLEDGEMENTS.....	74
ANNEX 5: REFERENCES CITED IN THIS DESK REVIEW	76
ANNEX 6: REFERENCES INCLUDED IN THE FULL LITERATURE SURVEY	79

ACRONYMS AND ABBREVIATIONS

3Si	Supporting Sustainable Sanitation Improvements (intervention in Bihar, India)
AusAID	Australian Agency for International Development
BMGF	Bill & Melinda Gates Foundation
CATS	Community Approaches to Total Sanitation
CBO	Community-based organization
CBP	Concrete block producer
CCT	Conditional cash transfer
CHOBA	Community Hygiene Output Based Aid (intervention in Cambodia)
CLTS	Community-Led Total Sanitation
CMAC	<i>Caja Municipal de Ahorro y Crédito</i> (Municipal microfinance institution in Peru)
CRM	Cement ring manufacturer
CSM	Creating Sanitation Markets
DFID	Department for International Development (UK)
DISHARI	Decentralized Integrated Sanitation, Hygiene, and Reform Initiative
DIY	Do-it-yourself
FSM	Fecal sludge management
FWWB	Friends of Women's World Banking
GIZ	<i>Deutsche Gesellschaft für Internationale Zusammenarbeit</i> (German Corporation for International Cooperation, the German bilateral aid agency)
GSF	Global Sanitation Fund
GPS	Global Positioning System
HCD	Human-centered design
iDE	International Development Enterprises (formerly)
IDRC	International Development Research Centre
IPC	Interpersonal communication
IUWASH	Indonesia Urban Water, Sanitation, and Hygiene Project (USAID)
M&E	Monitoring and evaluation
MBS	Market-based sanitation
MDG	Millennium Development Goals
MFI	Microfinance institution
MIS	Management information system
MLE	Monitoring, learning, and evaluation
NGO	Non-governmental organization
O&M	Operation and maintenance

OBA	Output-based aid
OD	Open defecation
ODF	Open defecation-free
OSS	One-stop shop
PAQPUD	<i>Programme d'Assainissement Autonome des Quartiers Peri-Urbains de Dakar (intervention in Dakar, Senegal)</i>
PHA	<i>Promotion de l'hygiène et de l'assainissement (intervention in Benin)</i>
PHAST	Participatory Hygiene and Sanitation Transformation
PSI	Population Services International
PVC	Polyvinyl chloride
RBF	Results-based finance
RC	<i>Relais Communautaires (volunteer hygiene promoters in Benin)</i>
RCT	Randomized control trial
RWSP	Rural Water Supply Programme (intervention in Tanzania)
SanMark	Sanitation Marketing
SDG	Sustainable Development Goals
SHG	Self-help group
SNI	<i>Sociedad Nacional de Industrias (Peruvian National Industry Association)</i>
SNV	<i>Stichting Nederlandse Vrijwilligers (Foundation of Netherlands Volunteers)</i>
SSIP	Small-scale independent providers
STS	Sustainable Total Sanitation (intervention in Nigeria)
SuSanA	Sustainable Sanitation Alliance
TSP	Turnkey solution provider
TSSM	Total Sanitation and Sanitation Marketing
UNICEF	United Nations Children's Fund
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
VSLA	Village Savings and Loan Association
W4P	Water for People
WASH	Water, Sanitation, and Hygiene
WaterSHED	Water, Sanitation, and Hygiene Enterprise Development
WHO	World Health Organization
WSP	Water and Sanitation Program (part of the World Bank Group)

GLOSSARY OF TERMS

Term	Definition
Bridge financing	An interim financing option that allows the borrower short-term access to funds until a long-term option can be arranged. In the case of results-based finance (RBF), bridge financing can provide the borrower with funds to invest in the outputs that trigger RBF payments. The RBF payments can then help repay the bridge finance loan.
Business model	A business model defines how a business creates, delivers, and captures “value”
Credit by supplier	A credit scheme whereby toilets, toilet components, or services are sold to a customer on full or partial credit (installment payments) by a supplier (e.g., retailer, mason).
Customer	The household or head-of-household that purchases, uses, and oversees the construction, operation, and maintenance of a toilet. Alternatively referred to as “consumer”, “user”, or “buyer.”
Demand activation	Direct sales and marketing activities carried out to persuade customers to convert product awareness and interest into a purchasing decision.
Demand fulfillment	Activities related to the delivery of sanitation goods and services to customers in response to successful demand activation (a customer’s decision to purchase).
Demand generation	Activities carried out to drive awareness of and interest in hygienic sanitation behaviors and improved sanitation products and services.
Enterprise	A business that facilitates the exchange of products and services between entrepreneurs (alternatively referred to as suppliers) and customers.
Entrepreneur	An individual who manages one or more enterprises.
Focal point enterprise	An enterprise in the sanitation value chain that plays the role of primary contact for a customer and provides information or facilitates the purchase of a toilet.
Hardware	Physical sanitation-related technologies in the sanitation sector, such as toilets and sewage infrastructure.
Human-centered design (HCD)	An approach to product development that aims to make products usable and useful by focusing on users’ needs and requirements, and by applying human factors/ergonomics and usability knowledge, and techniques. This approach is intended to enhance a product’s effectiveness and efficiency; improve human well-being, user satisfaction, accessibility, and sustainability; and counteract possible adverse effects of use on human health, safety, and performance. ¹
Impact investor	An investor seeking social or environmental returns in addition to financial returns. Some impact investors will accept lower financial returns to compensate for increased social or environmental benefits from an investment, though others make the case that the realization of social or environmental gains need not come at the cost of financial returns.
Improved toilet	A toilet that is designed to hygienically separate excreta from human contact ² .
Market activity	Transactions between a customer and supplier of a specific good or service.

¹ ISO 9241-210:2010(E)

² Definition retrieved from UNICEF/WHO Joint Monitoring Programme (JMP)

Term	Definition
Market-based sanitation (MBS)	The development of a sanitation market in which the user makes a full or partial monetary contribution (with savings and/or cash equivalents) toward the purchase, construction, upgrade, and/or maintenance of a toilet from the private sector. Such an approach also leads to strengthening—of resilience, sustainability, and capability—of the private sector. This definition builds on the definitions of “Sanitation Marketing” i.e., strengthening supply by building capacity of the private sector by layering a monetary payment by user.
Market depth	Total number of active customers and suppliers entering into transactions in a market. It can be a measure of the market activity.
Microcredit	Small loans offered to low-income individuals or those who do not have access to typical bank lending. Amounts are usually around a few hundred dollars, but the value of “micro” loans varies by country.
Microfinance	Financial services for low-income individuals or those who do not have access to typical banking services, including loans, savings, and insurance. Microfinance service providers can include MFIs, commercial banks, self-help groups, NGOs, savings and loan clubs, and others.
Microfinance institution (MFI)	Organizations dedicated to providing financial services to low-income clients. They tend to focus on microcredit, though some MFIs also offer savings and remittance services. They are typically funded by external loans, grants, and/or investors and have staff members that regularly visit borrowers.
Operation & maintenance (O&M)	Operation and maintenance of a toilet, which includes use, upkeep, repair, pit/tank emptying, and/or other aspects of fecal sludge management.
Performance award	An in-kind or cash award given as an incentive to an individual or a group after achieving a specified result (e.g., awards to a community upon achieving open defecation-free status).
Revolving fund	A loan fund in which the loans, when repaid, are disbursed again as loans.
Savings and loan groups	A group of individuals living close to one another who make regular savings contributions to a central pool that lends money to the members.
Soft financing/soft loan	A loan with a below-market interest rate that sometimes includes other concessions to borrowers, such as long repayment periods or interest holidays.
Trade credit	Trade credit is an agreement wherein an enterprise gets a deferral on the payment against delivery of goods. This is generally part of the terms of engagement between the enterprise and the upstream supplier.
Toilet	A sanitation fixture used for capture and storage, or disposal of human urine and feces. Unless specified otherwise, the term toilet in this document refers to the basic substructure (underground) components and the interface (e.g., slab, pan, water closet). Throughout this document, “toilet” is used in place of “latrine,” for consistency and regional universality, even if “latrine” was used by the original source.
Upgradeable toilet	A toilet design that allows the customer to add to existing components or replace them with superior or higher quality materials for increasing utility, convenience, or appeal in a way that caters to a wide range of income groups via flexibility for customization (e.g., addition of tiles to a cement slab or replacement of a thatch roof with a tin roof). Subsequent investments usually build upon the initial one so that, in principle, very little or none of the customers’ money or effort is “wasted.”

Term	Definition
Village Savings and Loan Associations (VSLAs) ³	A form of Saving and Loan group, in which a group of people save together and take small loans from those savings. The activities of the group run in cycles of one year, after which the accumulated savings and the loan profits are distributed back to members. The purpose of a VSLA is to provide simple savings and loan facilities in a community that does not have easy access to formal financial services.
Definitions related to Subsidy	
Cash subsidy	Funds provided in cash directly to a household towards completion of a desired activity (e.g., toilet construction), with the expectation that the household will then use the funds toward the completion of that activity. The cash subsidy can be unconditional or conditional on a pre-defined result (results-based finance). Generally employed in emergency response, recovery, and reconstruction situations.
Voucher	A subsidy provided in the form of a printed coupon or ticket that entitles the holder to a discount on, or that can be exchanged for specific goods or services from a sanitation provider. The subsidy amount is transferred by the implementing organization to the sanitation provider after the voucher has been turned in and the underlying activity pertaining to the voucher has been performed.
Results-based finance (RBF)	Finance that is provided upon achieving a desired result. This is a broad category of finance delivery mechanisms that includes ex-post performance awards, certain conditional cash transfers, and output-based aid.
Conditional cash transfer (CCT)	Results-based cash payment conditional on performance of a measurable desired behavior (e.g., toilet construction, continued toilet usage) or achievement of a pre-specified output target (e.g., sanitation coverage), disbursed following independent verification of achievement. CCTs are usually highly restricted to the poorest and most vulnerable population segments that are unable to perform the desired behavior without upfront cash subsidies, but have also been employed as incentives for the achievement of a community-wide target (such as village-wide toilet coverage).
Output-based aid (OBA)	A type of results-based finance in which aid is given to the implementer/local government/sanitation provider or to a household upon achievement of a pre-defined output or result. A consumer rebate (fixed amount refunded towards expense borne by an actor) is a typical example of OBA at the household level.

³ Definition retrieved from VSL Associates Website (<http://www.vsla.net/aboutus/vslmodel>)

PREFACE

The Water, Sanitation and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) project is a 5-year task order awarded to Tetra Tech on 16 September 2016 under USAID's Water and Development Indefinite Delivery Indefinite Quantity Contract (WADI). Tetra Tech implements the project in collaboration with several non-governmental organizations and small-business partners—Aquaya Institute, Family Health International (FHI 360), FSG, and Iris Group—that contribute expertise in state-of-the-art WASH programming and research. Distinguished academics, practitioners, and policy makers from across the WASH sector regularly provide expert perspectives to the project through an internal research working group and an external WASHPaLS Advisory Board.

WASHPaLS supports the Agency's goal of reducing morbidity and mortality in children under five as part of the Ending Preventable Child and Maternal Deaths initiative by ensuring USAID programming employs high-impact, evidence-based environmental health and WASH interventions. The project identifies and shares best practices for achieving sustainability, scale, and impact by generating evidence to support the reduction of open defecation and movement of communities up the sanitation ladder while also focusing on novel approaches for reducing feces exposure to infants and young children (IYC). Specifically, the project:

1. offers USAID missions and technical bureaus ready access to thought leaders and analytical expertise across a wide range of WASH themes in response to their needs (Component 1);
2. generates evidence through implementation research to increase the sector's understanding of and approaches to sustainable WASH services, the effectiveness of behavioral and market-oriented approaches to sanitation, and measures to disrupt pathways of fecal exposure to infants and young children (Component 2);
3. administers a small grants program on innovations in hygiene behavior change (Component 3); and
4. engages and partners with national and global stakeholders to promote the use and application of WASHPaLS-generated evidence and global best practices by practitioners and policy makers, tapping into broad coalitions and dynamic partnerships (Component 4).

Among the first tasks of WASHPaLS is the production and dissemination of three in-depth desk reviews focusing on community-led total sanitation (CLTS), market-based approaches for sanitation, and hygienic environments for IYC.

EXECUTIVE SUMMARY

Inadequate access to sanitation remains a significant problem globally and is linked to the transmission of numerous communicable diseases with a disproportionately large effect on children. The scale of investment required to deliver sanitation goods and services to those who lack access is beyond the capacity of public finance alone. The private sector has already proven itself a key player in the financing, construction, and operation of municipal water supply and wastewater systems in both developed and developing world settings, and has a significant role to play in the provision of onsite sanitation.

This desk review describes the current state of knowledge in market-based sanitation (MBS) and establishes a framework to analyze, design, and improve MBS interventions. It is based on a survey of approximately 600 documents on MBS, in-depth research into 13 MBS intervention case studies across the global south, and interviews with sector experts and program personnel.

Experts increasingly view MBS as a promising approach for scaling the delivery of onsite sanitation to households that are not connected to centralized wastewater collection and conveyance systems. Successful MBS interventions in Southeast Asia and Bangladesh demonstrate the promise of this approach, yet those successes have proven difficult to replicate in other regions, particularly sub-Saharan Africa and India, where the need is greatest. The challenges to scaling MBS include appropriate product and business model choices, the viability of sanitation enterprises, and the difficulty of unlocking public and private financing for sanitation.

Given this backdrop, this desk review offers a framework that: (1) draws upon and contributes to existing evidence across the three crucial areas highlighted; (2) helps funders and implementers to design, analyze, and improve MBS interventions; and (3) offers guidance for stakeholders and governments interested in using sanitation markets to expand sanitation coverage and reduce open defecation. In addition, this review highlights the larger contextual parameters that determine the applicability of MBS as an approach within a given market.

SELECTED KEY FINDINGS

Few “True” MBS interventions have scaled. Only 19 percent of the 96 *prima facie* MBS interventions we reviewed scaled to 50,000 households or more. Even with a scale threshold of 10,000 households—which we argue is low, considering the challenge—only 45 percent of interventions have cleared the bar. Of the interventions that have reached more than 10,000 households, less than half were truly market-based—that is, unlocking household investment as well as strengthening the private sector. Most interventions were either heavily subsidized or relied on short-term hardware supply by the government or donors which are likely unsustainable in the longer term.

Among MBS interventions at scale, we observed considerable variance in cost to scale. While the programmatic costs (i.e., excluding what customers spent on procuring the toilet) of reaching scale (more than 50,000 toilets) per toilet is quite variable, a majority of interventions in our sample were able to reach scale at a cost of between US \$20 and \$50 per toilet delivered.

If funders stay invested, interventions can scale up. MBS interventions can scale relatively quickly in some contexts and with continued funding and support, once appropriate product and intervention model have been developed and refined. Our analysis of year-on-year sales in selected interventions (based on data availability) found that sales begin to rise 4 to 5 years after the initiation of the MBS

intervention. MBS programs may therefore continue to hold promise to achieve scale when they are supported beyond the typical 3- to 5-year funding cycles—indeed, some of the successful interventions facilitated sales of more than 100,000 toilets during years 4 to 6, and had potential to increase market depth and coverage substantially over a longer period.

Still, scale barriers abound. Our survey of the MBS literature and analysis of selected MBS case studies indicates that, while the focus of these interventions tends to be market players and market mechanisms, successful interventions also addressed barriers external to market mechanisms, such as the legal and regulatory environment and direct government support. To apply this systems lens to MBS, we developed a comprehensive framework for MBS interventions that identifies the levels at which barriers to scale could exist and the programs that could intervene to bring about systems change (Figure 1). The framework identifies three distinct domains: (1) **context** such as social norms, economic environment, and geographical conditions, which interveners must seek to understand but typically cannot influence, (2) **business environment** shaped by government policy or the availability of raw materials and financial services, which interveners can potentially influence, depending on complexity and resources available, and (3) the core **sanitation market**, which is comprised of customers, enterprises, and entrepreneurs; each of which large-scale interventions can address. The severity of scale barriers across these domains determines the genuine depth of a market.

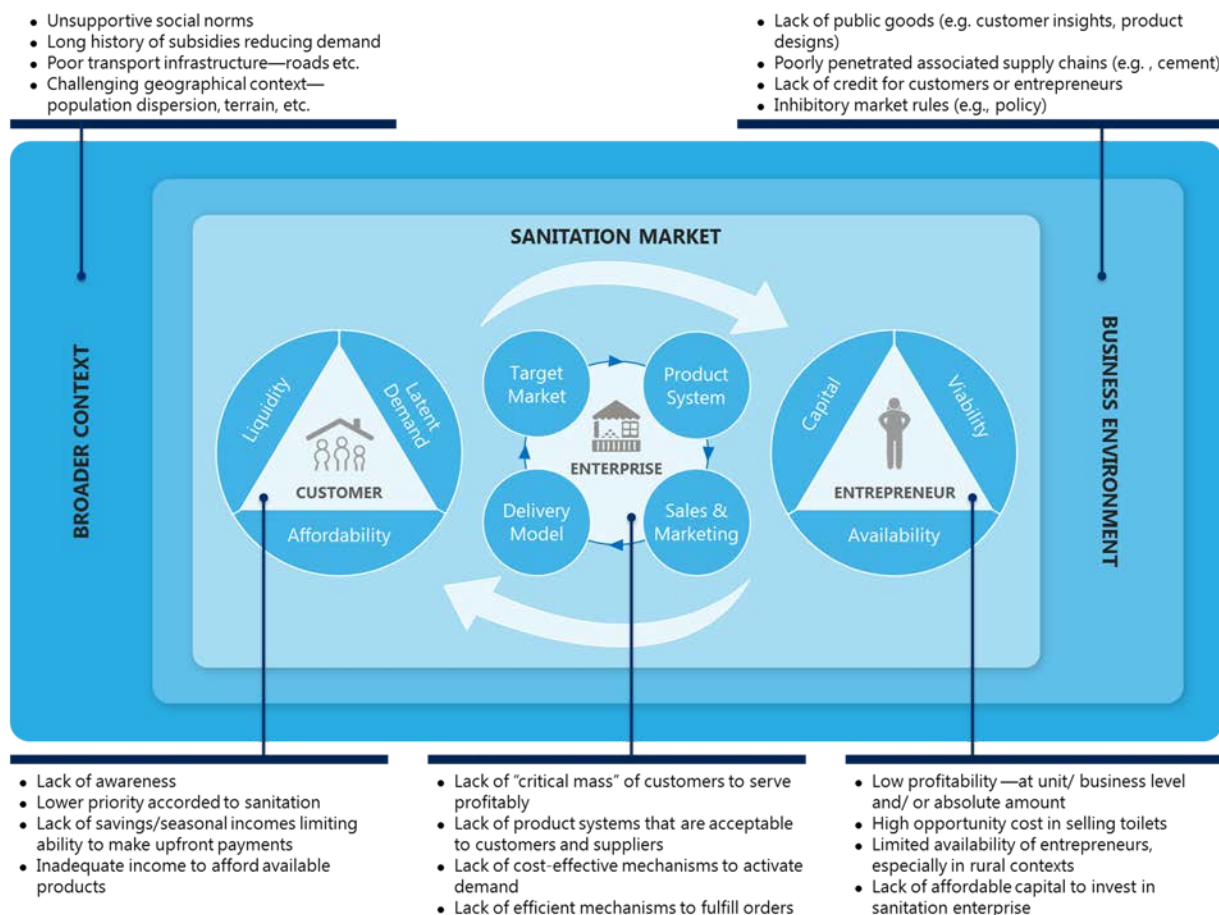
The design of a successful sanitation enterprise is an iterative process. Sanitation enterprise—the mechanism that facilitates the transactions between customers and entrepreneurs—is often ineffective and/or inefficient, thus limiting market depth. MBS interventions that attain scale design sanitation enterprises iteratively. Such interventions typically start by selecting a well-defined target market—a critical mass of customers willing to pay for toilets—rather than aiming to reach all customers simultaneously at the onset of the intervention. In starting with the “easiest” markets, MBS interventions can demonstrate the viability of sanitation enterprises to entrepreneurs early on and gradually expand to more difficult markets in successive phases.

To meet customer needs and preferences in a chosen target market, MBS interventions need to adopt iterative product design approaches that are user-centric (such as human-centered design) and reduce production complexity for manufacturers. The challenge here is balancing between catering to different target markets through a range of product system choices, and complicating customers’ decision making with too many choices. Sales and marketing often require intensive engagement, since mass-marketing or branding have limited effect in selling toilets.

MBS interventions often set up demand activation—direct sales and marketing activities carried out to persuade interested customers into a purchasing decision—mechanisms that employ independent actors (e.g., members of the community) to market and sell the product on behalf of entrepreneurs. The sustainability of this activity poses a challenge when externally-funded MBS interventions (rather than the businesses themselves) manage and compensate these sales/marketing personnel who are independent of the sanitation enterprises.

To meet consumer demand, delivery models that aggregate various supply chain components are needed to simplify customers’ buying experience. The degree of aggregation depends on the penetration and fragmentation of the existing supply chain, customer willingness to aggregate the inputs—components and labor—required to build toilets, and local enterprises’ assets and capabilities.

Figure 1: Barriers to scaling MBS across the sanitation market system



A range of market-compatible financial and demand activation mechanisms are required to overcome barriers to customers’ participation in the sanitation market. Introduction of affordable, yet desirable, products can partially compensate for customers’ inability to pay. For poorer customers, subsidies can complement MBS interventions by nudging targeted households towards purchase of toilets from the market. While a range of subsidy design and targeting methods exist, the challenge for MBS interventions is identifying the appropriate method that does not dampen willingness to pay for those customers to whom subsidy is not offered. Because customers often lack liquidity due to unstable or seasonal incomes, MBS interventions often must collaborate with credit providers, primarily MFIs, by providing incentives that range from demonstrating the market opportunity to subsidizing the development and issuance of sanitation loans. The sustainability of such mechanisms poses a challenge in markets where MFIs are fundamentally reluctant to offer consumption loans or find the proposition unviable without ongoing external support. Even where affordability and liquidity are not barriers, many customers do not purchase a toilet despite an interest in owning one because they accord it a low priority, amongst other reasons. Therefore, MBS interventions need to invest in demand activation—converting interest into purchase—activities.

Both the difficulty in achieving commercial viability and limited access to enterprise capital pose barriers to entrepreneur participation in sanitation markets. However, participation of entrepreneurs with requisite skills and existing, often sanitation-related, businesses can

partially address this barrier. Sanitation is rarely viable as a standalone, full-time business, especially in dispersed communities. To improve viability, sanitation enterprises adopt such strategies as geographic expansion, price reduction through product design innovation, and cross-selling other products and services. Even when sanitation enterprises are profitable, the complexity of the business and the capital required may make its attractiveness lower than other alternatives. Limited access to capital for sanitation enterprises also poses a challenge. While MBS interventions regularly seek to address this barrier, enterprise finance in sanitation is relatively lacking. Building successful enterprises thus requires both commercial and customer-facing skills—a rare combination indeed. MBS interventions often mobilize masons as entrepreneurs, but masons often lack the management skills required to grow their enterprises. MBS interventions that scale generally attract entrepreneurs who already have existing businesses related to sanitation (e.g., construction) and who add toilets to their product portfolio as a complementary business line, leveraging their existing assets and capabilities.

Interventions impacting the business environment can accelerate transactions between customers and entrepreneurs and/or reduce barriers to participation in the market. For example, such “market rules” as limits on the use of subsidies by the government, or enforcement of housing laws and regulations can encourage households or landlords to purchase toilets. Supply chains with wide reach (e.g., for those of construction raw materials) can improve the enterprise viability, as can creating public goods (such as making market intelligence and product designs freely available to small enterprises).

MBS alone might not be an adequate approach in all markets. Broader contextual factors affect the effectiveness of MBS in a given market. For example, MBS interventions benefit from latent demand stemming from social norms that reward hygienic sanitation behavior. Favorable geographic conditions and transport infrastructure make it easier for entrepreneurs to sell toilets at affordable prices. These factors often cannot be addressed by an enterprise or external donor alone, and require other complementary approaches.

Traditional Monitoring, Learning, and Evaluation (MLE) approaches may be inadequate to properly explain the success or failure of MBS programs. The achievement of MBS objectives (e.g. large-scale delivery of sanitation-related goods and services to underserved populations by a thriving private sector) may be driven in large part by power dynamics and social norms that are not easily captured in commonly applied MLE logic models. Understanding not just whether, but also *why* and *how* MBS programs work requires both attention to these complex variables and creative methods for monitoring them.

PRELIMINARY GUIDANCE FOR STAKEHOLDERS

We offer guidance to funders, implementers, and governments.

Funders should recognize that MBS may be a necessary but not sufficient intervention to spur the delivery of toilets in some contexts, meaning that it represents one in a suite of preferred approaches. Changes in the sanitation market system can take time, but MBS interventions can scale up if funders remain invested and flexible over longer than 5-year funding horizons. We also encourage funders to invest in and adopt MLE systems that are tailored to the unique circumstances of MBS interventions.

Implementers need the flexibility to iterate in order to ultimately formulate a successful, locally relevant MBS program. Implementers, like funders, also need to consider the broader sanitation market and account for barriers related to public goods and associated supply chains. Considering that sanitation entrepreneurs can come from across the market system, implementers need to identify those with the right capabilities and incentives to function as customer-facing focal points of sale in a given market.

These areas of emphases should be accompanied by non-financial direct support to entrepreneurs, ranging from training and know-how to mentoring and business development services. Finally, to ensure sustainability of the market, implementers should encourage design and implementation to maximize the likelihood that the market continues to function even as donors and funders exit.

Governments, unlike funders and implementers, have the authority to intervene and influence the broader context. Traditionally, they have invested in public education campaigns, but they can also put in place market rules (laws and regulations) favorable to private sector participation, such as careful provision of subsidies for the poor or reduction of fiscal barriers (e.g., import tariffs and taxes) to enhance the viability of sanitation enterprises.

AREAS FOR FURTHER RESEARCH

The desk review highlights key lessons, but it also identifies areas where further exploration is required. Knowledge gaps remain in the factors that influence the short- and long-term viability of sanitation enterprises. While evidence suggests that existing entrepreneurs are better positioned to sell toilets than new ones, we need to better understand the factors that influence entrepreneurs' decision to enter or remain in the sanitation market, including, but not limited to, the profiles of entrepreneur best suited to act as customer-facing focal points of sale. Further research into those market rules that can create a positive environment for MBS also could reveal promising policy change opportunities. Subsidies have already played a complementary and compatible role with MBS; however, more research is needed into the optimal size and modality of subsidies for unlocking household investment while avoiding market distortion.

I.0 INTRODUCTION

Inadequate access to sanitation remains a significant problem globally. According to the Joint Monitoring Programme (WHO/UNICEF 2015), 2.4 billion people still do not have access to basic sanitation facilities, while 970 million people still practice open defecation. Inadequate sanitation is linked to the transmission of numerous communicable diseases—particularly cholera, dysentery, hepatitis A, typhoid, and polio—with a disproportionately large effect on children. The scale of investment required to deliver sanitation services to the hundreds of millions of people around the world that currently lack access is staggering.

In the context of onsite sanitation, in which households are not connected to centralized wastewater collection and conveyance, market-based sanitation (MBS) interventions—through which private sector actors supply toilets and related services to individual households—are a promising approach to addressing the global sanitation challenge sustainably and at scale.

For the purposes of this document, **MBS refers to an onsite sanitation-related product or service in which the user makes a full or partial monetary contribution (with savings and/or cash equivalents) toward the purchase, construction, upgrade, and/or maintenance of a toilet.** We focus on rural areas and small towns, within the following operational definitions:

- **Toilet:** A sanitation fixture used for the capture and storage or disposal of human urine and feces. Unless specified otherwise, the term “toilet” in this document refers to, at a minimum, the basic substructure (underground) components and the interface (e.g., slab, pan, water closet). A toilet may include the superstructure (walls, roof, and a door). We consider sewerage and fecal sludge management (FSM) only to the extent that they affect the demand for or supply of toilets. The term “toilet” is used in this document in place of “latrine” for consistency and regional universality, even if “latrine” was used by the original source.
- **Household toilets:** Single-family toilets and shared toilets (up to a maximum of five families sharing one toilet). Community toilets and public toilets are not included in the scope for this research.

In theory, MBS *should*:

- provide customers with products that they want and for which they are willing to pay;
- be financially sustainable—a sanitation enterprise earns profits by delivering products;
- be cost-effective and scalable; and
- make households more likely to derive the benefits of sanitation (e.g., improved health, privacy, dignity) through the use and maintenance of toilets that they value (Cairncross 2004).

These characteristics point to what should be the core outcome of MBS: a sustainable market that enables more customers and entrepreneurs to exchange products and services, thereby increasing market depth and reducing the burden on public financing. But as we look across the globe, it is clear that MBS interventions that deliver at scale are the exception rather than the rule. Among those exceptions are a program in Bihar, India, where more than 190,000 households that did not have access to sanitation facilities bought new toilets at prices that ranged from US \$250 to \$300, making use of existing market players (PSI India 2017). In Mozambique, a team led by Björn Brandberg developed and marketed the *SanPlat* slab that has been purchased by more than 4 million households globally (Black and Fawcett 2008).

What can these fairly unusual successes teach us about how market-based approaches can deliver sanitation products and services sustainably and at scale?

The notable successes of MBS interventions in Southeast Asia (e.g., Cambodia, Vietnam) and Bangladesh have proven thus far difficult to replicate at scale in other contexts. Even where they are successful, MBS interventions have often failed to penetrate the lowest-income strata. Broadly, at the start of the desk review, we hypothesized that limits on MBS success will depend to some degree on the following factors that also constitute gaps in the evidence base:

- **Appropriate product and business model choices:** A key function of markets is to offer customers a range of products that match their preferences and budgets. However, MBS interventions often fail to invest sufficiently in product design prior to or during implementation. There is a need to identify approaches that result in products that are suitable to the geographical context, offer choice in both designs and price points, and are compatible with locally prevalent business models.
- **Viability of local entrepreneurs:** The supply of sanitation products in rural contexts across developing countries often depends on small-scale entrepreneurs, who may be lacking in many rural and peri-urban areas. Those already in the market may be hesitant to commit more fully to the sector while potential new entrants may not believe that sanitation is a sufficiently attractive business opportunity to enter. There is thus a need to identify business models and approaches that provide a realistic path to profitability and scale.
- **Unlocking public and private financing:** Credit can play a critical role in many market-based solutions. However, consumer finance (e.g., microfinance) for sanitation is often not available at affordable rates, and sanitation entrepreneurs often lack options for business finance. There is a need, therefore, for public and private financing to be “unlocked”—properly designed, leveraged, directed, and used—in order to best foster and scale MBS (Trémolet 2011).

Against this backdrop, and with an overarching aim to illustrate how and when an MBS approach may best work within a given context, this desk review uses a mix of literature survey, key informant interviews, and case study analysis to offer a framework that:

- draws upon and contributes to the existing evidence base across the three crucial areas highlighted above;
- helps funders and implementers in designing, analyzing, and improving MBS interventions by taking a comprehensive view of barriers to scale across the sanitation market; and
- offers guidance for stakeholders who are interested in making use of sanitation markets to expand sanitation coverage and reduce open defecation.

Organization of this desk review

This document organizes our findings across three different sections reflecting a process that began by focusing a systematic literature review on evidence gaps selected the basis of the past experience of the broader team, reflected in Section 2 (Literature Survey). On completion of the literature survey, we expanded the aperture of analyses to include a survey of interventions across the world, leading us to organize our findings around a framework for scaling sanitation market systems. The structure of key sections in the desk review is presented below:



Section 2 – Literature Survey

We initially organized the literature survey and case study research around **three gaps in the evidence base** for MBS – appropriate product and business model choices, viability of local entrepreneurs, and unlocking public and private finance.



Section 3 – Intervention Case Studies

We used a case study approach to study 13 interventions globally. The section details the coverage of issue areas, and provides a summary of the interventions, high level meta-analysis of the selected interventions, and overall data used to identify the 13 interventions.



Section 4 – The Sanitation Market System

Analyses revealed that successful MBS interventions were influenced by the broader enabling environment and context. Therefore, we expanded our analyses to detect activity not only in the core demand-supply interaction but also in the broader realm that shape sanitation markets. In-depth findings from case studies and select literature are thus organized by a **comprehensive framework for sanitation market system**. Guiding principles on **monitoring, learning, and evaluation** are treated separately in **section 5** since they draw upon non-sanitation literature to compensate for limited findings from case studies.



Section 5 – Monitoring, Learning, and Evaluation

Monitoring, Learning, and Evaluation (MLE) is an important component of the MBS framework. We gleaned few insights on MLE as part of our survey of the MBS literature and intervention case studies, and thus offer some additional thinking on MLE for complex systems that is particularly relevant for the sanitation market systems.



Section 6 – Conclusions

In distilling the findings into recommendations, we categorized the **guidance by different types of actors**—funders, implementers, and government—who may be more receptive to specificity in terms of the roles they can play or actions they can take across the sanitation market system.



Section 7 – Areas for Further Research

We make several recommendations in the previous sections on actions various stakeholders should take to scale market-based sanitation. At the same time, we recognize the paucity of rigorous evidence in some areas and the need for further research to augment the evidence base behind the framework. This section highlights some of these areas for further exploration.

2.0 LITERATURE SURVEY

We compiled a collection of literature sourced from sanitation sector-specific databases in consultation with sector experts, identifying approximately 600 documents (from more than 1,400 search results) and reviewing them for insights that focused on the three evidence gaps described above (appropriate product and business model choices, viability of local entrepreneurs, and unlocking public and private financing). Details are provided in Annex 1: Methodology for the Literature Survey.

Though the sheer number of MBS-related articles we identified is significant, the quality of the literature is decidedly uneven. For the purposes of this desk review (and given the scale of our survey), we offer here only a summary of selected key findings (with the full list of consulted references provided in Annex 6). This section is intended to provide a reflection of the most consistent outputs of the articles we consulted, but *critical analysis and synthesis* of the literature, and integration with our intervention case studies, is included as part of our Framework formulation in Section 4.

2.1 BUSINESS MODELS: TARGET MARKETS, PRODUCT DESIGN, AND COMMERCIALIZATION

A successful business requires a clear and comprehensive understanding of the **target market** that the business is trying to serve and what unique, differentiated proposition it offers to those customers. In-depth market research helps make a business case for targeting low-income segments, including identifying and targeting the specific stage of the sanitation ladder at which target communities are positioned (Devine and Kullmann 2011; Müllegger et al. 2010). Market research also can suggest ways to better understand customers, identify factors that catalyze demand (i.e., customers' preferences, aspirations, and the features for which they are willing to pay), and segment customers to target specific groups in each particular context (Coombes et al. 2013b; Perez et al. 2012; Cairncross 2004). By contrast, insufficient market research at the beginning of an intervention can lead to incorrect assumptions about customers' needs and aspirations, and may lead to project failure (Wright 1997; McIntosh et al. 2009). MBS programs need not target every market segment. Instead, addressing gaps via complementary programs can help cater to different segments with tailored strategies (SAAB, n.d.). Indeed, the surveyed literature on MBS programs suggests a focus on two major groups: low-income rural communities and low-income urban slum-dwelling communities, both of which often lack access to improved sanitation. Segmenting customers also can help direct focus toward the specific requirements of each group, from the menstrual hygiene needs and safety concerns of women to the constraints faced by elderly or disabled customers (Mission 2016; WSSCC 2010).

Another essential aspect of understanding the target market is that willingness to pay may be driven by factors independent of income or assets. Poor households often are willing to invest in sanitation solutions if they can (1) be convinced of the potential benefits and (2) spread the investment over time (Trémolet et al. 2011; Cairncross 2004). At the same time, gender, ethnicity, and culture also play significant roles in shaping attitudes toward sanitation (N. K. Nguyen et al. 2016; Kamasan 2008; Coombes et al. 2013a). For instance, some groups may still see open defecation as an accepted practice that is both traditional and convenient (Devine 2009; Perez et al. 2012). Men in rural Benin, for example, may appreciate the fertilization of their soil and the fresh air that comes with defecating in the open (Van Daalen 2012). A study in rural Bangladesh, India, and Pakistan also found that men habitually defecated in the open while working in the fields, and that many of them neither liked nor saw a need to use household toilets while at home (WSP 2005a). This reinforces an earlier finding by Mukherjee (2011) that both men and women of productive age in Cambodia and Indonesia reported defecating in fields and irrigation canals during the workday when they were far away from household latrines. In some areas of rural Nepal, menstruating women are considered impure and may be forbidden from

using household toilets (Rautanen 2015; Shrestha 2015). Despite the decision-making power of men, women are critical in driving the decision to purchase a toilet (Nielsen Indonesia 2009; Shah et al. 2013). Research in Bangladesh and Lesotho suggests that female-headed households are thus more likely to adopt sanitation solutions (Kullmann and Ahmed 2011; Blackett 1994).

Identifying the best approach to **product design** may not be straightforward. On one hand, some observers have argued that simplifying products and services for customers can improve the value proposition and expedite the conversion from latent demand to uptake and use (Chase et al. 2014; Pedi et al. 2011b, 2012). For example, Pedi et al. (2012a) suggest that the success of Cambodia's "Easy Latrine" owed largely to reducing the number of transactions required during the purchasing process. Integrated product and service models—such as turnkey solutions—that address multiple value chain stages and simplify service delivery appear to be highly appealing (IRC 2011; Devine 2010; Remington et al. 2016).

On the other hand, customers often need a range of options that suits a variety of budgets and circumstances (Jenkins and Scott 2007; Cairncross 2004). In addition, providing product options helps meet the latent demand for affordable toilets, as well as the demand from wealthier households who may not be willing to purchase lowest-cost toilets (Salter 2008). As a result, one-size-fits-all solutions often do not help achieve universal access to sanitation (Devine 2010; Mukherjee 2012); still providing too many options can overwhelm customers and complicate their decision making (Rosenboom et al. 2011; Devine and Kullmann 2011; Perez et al. 2012).

Upgradeable toilets can be a good option that caters to the demand for affordable sanitation while still providing high-end designs in the long run (Devine 2010; Perez et al. 2012; Pedi et al. 2012). Through modularization, products can be gradually upgraded as household needs and budgets change (Devine 2010). An additional advantage is that upgradeable toilets follow the pattern of incremental home improvement prevalent in many lower-income communities around the world (Devine and Kullmann 2011). These basic, low-cost products also help businesses acquire repeat customers who can spread their investments over time (R. Narayanan et al. 2011; Pedi et al. 2012). However, promoting upgradeable toilets may still require clear information about how to gradually upgrade different models and how to spread out costs over time (Sijbesma et al. 2011; Salter 2008).

Customers rarely are willing to compromise on the key features of a toilet, and they often desire much higher-level solutions than they can afford (Jensen and Usswald 2014; R. Narayanan et al. 2011). In certain contexts, where use of human waste as a resource is acceptable, as illustrated in a WSP field note from Malawi (Morgan 2007), customers may favor sanitation solutions that offer long-term cost recovery mechanisms such as toilets that convert human waste into fertilizer.

With respect to **commercialization**, our survey yielded findings that can be divided among sales and marketing, and delivery model choices to address the challenge of poor supply chain.

It is argued that local sanitation enterprises rarely engage in proactive promotion activities, relying instead on passive sales since they do not view sanitation as a profitable or customer-generating product line (Baetings et al. 2014b; Sijbesma et al. 2011). Household demand depends on the motivation, ability, and opportunity to access sanitation (Jenkins 2004). Given that messaging around health benefits alone rarely catalyzes sanitation demand, marketing should focus on the functional and emotional attributes of the specific products being sold, such as convenience, safety, durability, status, and privacy (Scott et al. 2011; Devine and Kullmann 2011; Perez et al. 2012). Additionally, gender norms affect how customers value toilets. Men are more likely to place higher value on social status, while women tend to value aspects like convenience, safety, and comfort (Sijbesma et al. 2011; Van Daalen 2012). Community-Led Total Sanitation (CLTS) efforts also offer an important opportunity for promotion, which could focus on referrals and follow-up activities with customers (Kov et al. 2015; Maanen et al. 2010; Mission 2016). These can include informal referrals, from customers who recommend their preferred suppliers to

friends and neighbors (USAID 2010), to formal referral mechanisms, ranging from referral cards distributed at sanitation workshops with the contact details of toilet suppliers to sales agents following up with customers and referring them to partner suppliers (Graf et al. 2014; Kov et al. 2015). Relationships between community members also play a significant role in promotion. Depending on the context, neighbors or community leaders can be effective promoters and sales agents, as they command high degrees of trust (Devine 2010; Pedi et al. 2011b). Women, especially those in positions of relative leadership, can be particularly trustworthy and persuasive. Pedi et al. (2011) found female local government representatives in Cambodia to be effective promoters of sanitation. Similarly, female leaders, such as members of Vietnam Women's Unions, were instrumental in promoting and delivering sanitation (Sijbesma et al. 2010a; C. C. Nguyen et al. 2016). Given the level of trust in well-respected community members, elevating the public profile of a project through promotion by religious or village leaders can make customers more open to adopting improved sanitation solutions (WSP and Government of India 2008; Heierli and Frias 2007).

Unclear, underdeveloped, or fragmented supply chains for hardware and service result in low uptake, even if demand increases, because households find it challenging to independently procure and service toilets (Devine 2010; Chase et al. 2014). Successful and sustainable MBS programs require comprehensive models that consider all value chain stages, from toilet design to safe emptying of pits and management of fecal sludge (Hawkins et al. 2013; Trémolet et al. 2010a). Nevertheless, many players lack vision across the value chain to form useful partnerships (Ennovent et al. 2016). **Delivery models** that bring together different supply chain functions—such as one-stop shops, umbrella brands, or vertical networks—can potentially reduce the complexity of the purchasing process (IRC 2011; Devine 2010; Pedi et al. 2012, 2011b). Our survey of the literature uncovered four key delivery model categories: turnkey solution provision (Kappauf 2011), network (Devine and Kullmann 2011; Kappauf 2011; IRC 2011), one-stop shop (Pedi et al. 2011b; Kappauf 2011), and do-it-yourself (DIY) (Scott et al. 2011). However, players may be reluctant to aggregate functions in rural areas where the supply chain is weak and seen as expensive to serve due to poor transport infrastructure (Sy and Warner 2014). Each of the four delivery models is discussed in some detail in Section 4.

2.2 SANITATION ENTREPRENEURS: AVAILABILITY, VIABILITY, AND SUPPORT

Many rural and peri-urban sanitation markets in developing countries suffer from a **dearth of sanitation entrepreneurs** across the value chain (Valfrey-Visser and Schaub-Jones 2009). Those already in the market are often hesitant to commit more fully to the sector, while potential new entrants do not believe there is an attractive enough business opportunity to enter (Cole et al. 2012; Gero and Willetts 2014; Robinson 2011). Others may have a sanitation-related business line but do not devote much attention or resources to it, or may try their hand at the sector but fail to survive in the market over time (Devine and Kullmann 2011; Robinson 2011). Women are under-represented as suppliers in the sanitation market, which may be due in part to social norms around gender roles (Cole et al. 2012; Müllegger et al. 2011), but it also can be due to the challenges women face in accessing credit (Sijbesma et al. 2008). As a result, the supply of toilets to customers is weak; these markets suffer from high prices, unreliable quality, fragmented supply chains, and poor coverage (Nattabi et al. 2015; Pedi et al. 2013).

Private sector players in the sanitation value chain may include large-scale industry players—such as cement and toilet component manufacturers, as well as waste management companies or private sector operated utilities—and small-scale, independent providers (SSIPs), such as small-scale concrete component producers, distributors, retailers, and masons (Heierli et al. 2004; Ministry of Health - Kenya 2016). These SSIPs—referred to here as “sanitation enterprises”—can be divided into two broad categories: those that produce and sell sanitation goods and inputs, like cement rings or plastic pans, and those that provide sanitation services, like installing toilets or emptying pits (Valfrey-Visser and Schaub-

Jones 2009). Actors in the latter category can be further grouped by their position in the sanitation value chain; and each position, further, has a varying degree of private sector participation, as reflected in Table I.

Table I: Distribution of private sector participation across the sanitation value chain

Value chain position (vis-à-vis human feces)	Description of role	Estimated market share of private enterprise
Capture (onsite)	Small-scale, often informal provision of services related to construction of sanitation facilities (e.g., toilet construction, small-bore sewer network construction)	~90%
Transportation (onsite)	Removal and transportation of waste from pits and septic tanks (e.g., vacuum trucks, manual pit emptiers)	~70%
Treatment/ disposal	Treatment of waste (mainly the preserve of government authorities)	~10%

Source: Valfrey-visser and Schaub-jones 2008

The estimates in Table I vary depending on the context. However, what remains true across most geographies is that entrepreneurs play a significant role in the capture and transportation of feces via onsite sanitation. By contrast, waste and wastewater management tend to be the responsibility of government.

Sanitation entrepreneurs also can be classified by the extent to which sanitation is their core business, presented here in descending order of reliance on the sanitation sector (Kappauf 2011):

- independent providers/suppliers with sanitation as a core business;
- independent providers/suppliers providing sanitation products and services, but *not* as a core business; and
- individuals who are occasionally involved in toilet construction or manual pit emptying.

Small-scale producers, distributors, retailers, and service providers can play an important role in rural and peri-urban areas due to the prevalence of onsite sanitation (Valfrey-Visser and Schaub-Jones 2009). These entrepreneurs tend to be independent operators and many are one-person or family-run businesses. They tend to be unregistered and operate in the informal sector, and as a result, often are off the radar of municipalities and financial institutions, and therefore lack scale (Devine and Kullmann 2011; R. Narayanan et al. 2011). However, they are the main providers to low-income customers, since formal players often consider this segment unprofitable, hard to reach, and expensive to serve (Nothomb et al. 2014).

One challenge to the availability of entrepreneurs frequently cited in the literature is that of skillsets and attitudes. Potential entrants into the sanitation market often lack in-depth knowledge of sanitation and may be unable to appropriately advise customers on their choices (Baetings et al. 2014a; Sijbesma et al. 2010b). Many artisans and small businesses lack the entrepreneurial spirit, innovative mindset, or requisite appetite for risk needed to succeed (WSP 2005b; Jensen and Usswald 2014). Entrepreneurs in certain places, such as Vietnam, may independently innovate and expand their product range to increase their customer base (Sijbesma et al. 2010a). However, most maintain a passive approach to sales and marketing, often relying on intermediaries to raise awareness about sanitation (IFC 2015; Pedit et al. 2011b). In addition, a widespread lack of customer service for low-income customers (e.g., repairs and pit-emptying) presents a major challenge to the sustained uptake and usage of sanitation products (Pauschert et al. 2012; PATH 2012; Devine and Kullmann 2011). Feedback loops that monitor toilet usage and hold service providers accountable for poor delivery are thus one potential method for improving or sustaining usage levels (Colin 2012; Pinto 2013).

A successful business should create profit incentives and a sense of ownership for all players involved. An exclusive focus on sanitation may sometimes not allow for a **business to be viable** (BRAC 2011; Wright 1997; Baetings et al. 2014b). Sanitation supply chains are often fragmented, there is poor coordination among supply chain actors, and many operate in isolation from one another (R. Narayanan et al. 2011; Nattabi et al. 2015). In rural areas, long distances, as well as limited and unreliable transportation infrastructure, present another constraint, as regional-level entrepreneurs face significant overhead costs when they travel to more remote communities; viability may depend upon a critical mass of orders (R. Narayanan et al. 2011; Perez et al. 2012). It is thus unsurprising that sanitation is rarely a core business for market players, who rely on high-margin sanitation products or product lines beyond sanitation (i.e., products with which they are familiar) for long-term sustainability (Devine 2010; IRC 2011; Jensen and Usswald 2014). To address the viability issue, diversification of business lines—whereby a business offers products and services beyond sanitation—is helpful at an individual firm level.

Addressing the needs of both first-time and repeat customers (i.e., for repairs and upgrading) can be another way to strengthen business sustainability, while at the same time ensuring that households move up the sanitation ladder (Baetings et al. 2014b; BRAC 2011). Additionally, offering products that are aimed at more affluent segments also can be a good option for boosting business sustainability (Baetings et al. 2014b).

The regulatory environment also can present challenges. While small- and medium-scale sanitation entrepreneurs may be abundant in some settings, legal and regulatory frameworks tend to be focused on large-scale infrastructure, such as wastewater conveyance and treatment services provided by a state utility or by large monopoly providers (Mcgranahan and Owen 2006). Non-existent or inadequate standards for small private players may prevent them from formalizing their activities and developing their businesses. Private operators could play a more substantial role if they were more formally recognized, taken into consideration in policies and strategies, and given access to legal security (Holmberg and Sarmiento 2016; Valfrey-Visser and Schaub-Jones 2009). Finally, senior government officials who have been working in supply-driven sanitation for decades may be unfamiliar with (and skeptical of) market-based approaches, thus rendering lobbying for a more encouraging regulatory environment difficult (“Master of Integrated Water Management Integrating Sanitation Marketing into a National Program A Case Study in Vietnam” 2011).

Our survey of the literature points to a least two areas of possible support to strengthen sanitation entrepreneurship: **capacity building** and **demand generation and activation**.

One form of **capacity building** common in MBS interventions is the training of local masons in toilet construction techniques and in the marketing of sanitation products and services (WSP - Tanzania, n.d.). Amelink et al. (2009) credit mason training in Indonesia, India, and Tanzania with helping to meet the demand created by sanitation promotion activities. Similarly, local service providers trained by WSP’s Creating Sanitation Markets program in Peru installed over 40 percent of the toilets sold by the intervention (“Domestic Private Sector Participation in Peru Sanitation Markets at the Bottom of the Pyramid” 2011). Training masons can help standardize product quality, as customers often rely on them for information and toilet installation (Pedi et al. 2012; Perez et al. 2012). Regular visits by implementers following initial training sessions can provide further support by monitoring quality standards (Baetings 2016; Kov et al. 2015). The overall success of mason training activities has been mixed, however, and few documented cases show trained masons who have emerged as entrepreneurs and remained active in the sector (Rosensweig et al. 2012; Robinson 2011).

A consistent theme in the literature is that mason training—or other supplier capacity-building initiatives—works best when accompanied by activities that foster the broader development of local supply chains (Jaime Frias and Mukherjee 2005). Implementers can support supply chain development by playing a range of market facilitation roles, including demonstrating market opportunities, negotiating

upstream supplier credit and providing links to creditors, supporting product development and innovation, and designing and producing low-cost, generic marketing materials (Boorstin et al. 2015; Pedi and Jenkins 2013a; Pedi et al. 2011b). Some sources argue that market facilitation should be limited to activities that can be sustained after the facilitator's exit by transitioning responsibility for them to other local actors; one example of this transition is when social marketing activities are taken over by local government authorities or community-based organizations (Pedi et al. 2011b).

Women entrepreneurs face additional barriers. A UNICEF workshop with female water and sanitation entrepreneurs across India proposed gender sensitization courses, particularly for government officials, as an initial step toward improving the acceptance of women as entrepreneurs in the sector, as well as inviting officials to observe the work of women (WSP 1999). Another challenge faced by women entrepreneurs as a result of prevailing norms is unequal pay; women are expected to charge lower fees for their services, thus hurting their commercial viability. Some have suggested training women in negotiation skills to increase their confidence when charging customers market rates (WSP 1999).

In the rural areas, **demand** for improved sanitation may be low or hidden. This is especially true in areas with ample open space and vegetation for private open defecation, and where needs other than improved sanitation have a higher priority for households (Sy and Warner 2014). Jaime Frias and Mukherjee (2005) find that households' low prioritization of spending on improved sanitation can be due to overestimates of latrine costs; low awareness of the potential benefits of latrines; low awareness of latrine designs, models, and other sanitary options; social acceptance of open defecation; and space limitations. Implementers' support for demand generation (i.e., shifting sanitation behaviors) and demand activation (i.e., persuading a customer to purchase) for sanitation products and services can be critical (Cairncross 2004; Rosensweig et al. 2012), though it also can cause problems if implementers generate demand before sanitation entrepreneurs are ready to provide sufficient products and services to satisfy that demand. In such cases, households may not react favorably to future sanitation marketing messages, since they may be frustrated by their inability to satisfy their newly-generated demand. Thoughtful sequencing of demand generation and activation activities with support for sanitation entrepreneurs is important (Pedi and Jenkins 2013c; Amin et al. 2011).

2.3 UNLOCKING PUBLIC AND PRIVATE FINANCE FOR MBS

Finance has a critical role to play in any MBS solution. It encompasses the sources and flows of funds throughout the sanitation ecosystem that can jumpstart fledgling sanitation markets and enable existing sanitation markets to grow and function sustainably over the long term. Public and private financial resources usually already exist in sanitation contexts. However, they need to be “unlocked”—properly designed, leveraged, directed, and used—to best foster and scale MBS solutions, and to maximize sanitation improvement (Trémolet et al. 2010a).

Finance can support several components of the sanitation value chain. These include creating or activating demand for improved sanitation, providing customer information on and marketing services for sanitation products and services, facilitating the local production and supply of products and services, and promoting the efficient operation and maintenance of toilets (Fonseca et al. 2007; Sijbesma et al. 2008).

Finance also can help households adopt improved sanitation by increasing *affordability*—ensuring the household has sufficient resources to purchase a toilet (BRAC 2011; PATH 2012; Trémolet et al. 2010a)—and *liquidity*—solving the timing mismatch between household resource availability and hardware expenditures (Trémolet and Kumar 2013; Trémolet et al. 2010a). Repayable financing (credit) sources can help fill in the gaps in finance that the three “Ts” of public finance—tariffs, taxes, and transfers—are not able to cover (Dauenhauer 2015; ISF-UTS 2014; Waldorf 2012).

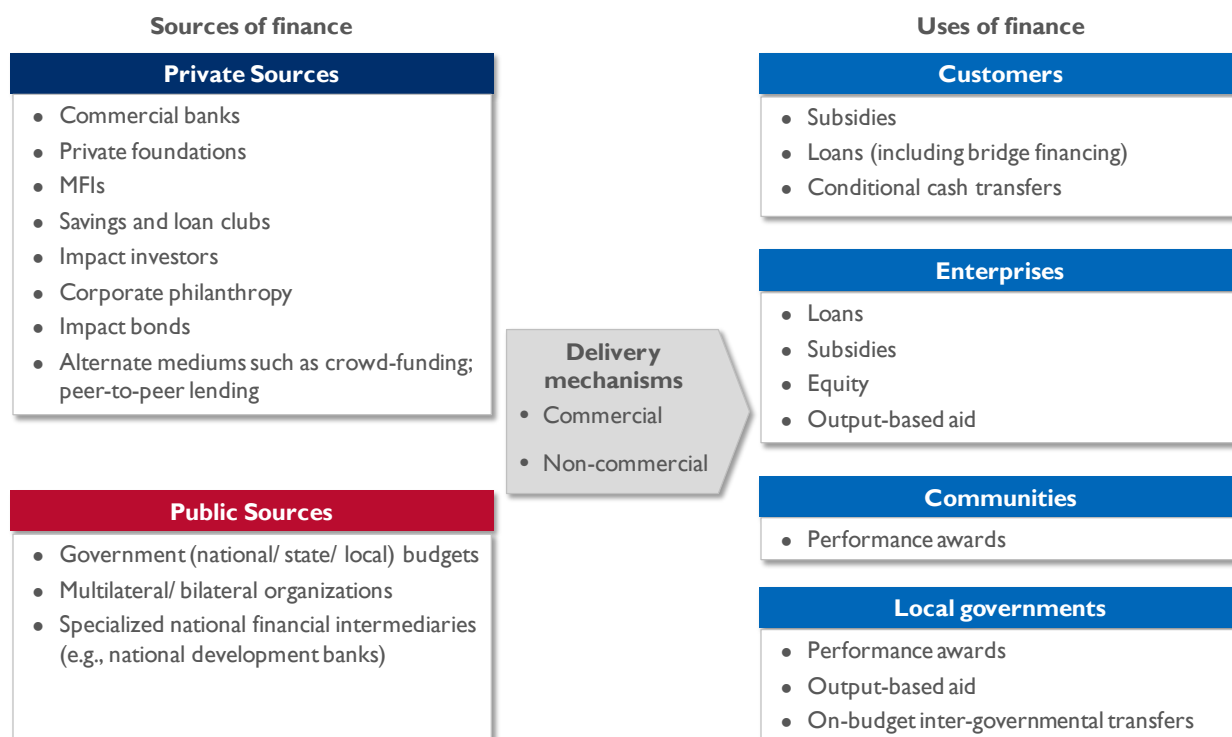
Finance for entrepreneurs can be a key mechanism for bolstering the supply side of a sanitation market, because it enables players in the sanitation value chain to overcome barriers to starting up their businesses, expanding existing sanitation-oriented business lines, or launching new ones. However, sanitation entrepreneurs' businesses are often small and informal and thus lack the collateral typically required for formal business loans. As a result, entrepreneurs usually raise funds in the informal sector to finance investments in equipment and infrastructure (Bruijne et al. 2007). Another alternative they use is credit provided by other enterprises further up the value chain; for example, wholesalers may extend credit to retailers for them to purchase products and materials (Gero and Willetts 2014; Padi et al. 2011b).

Impact investors have begun providing enterprise finance through loans and financial equity. In this context, providing equity involves injecting capital in exchange for the partial ownership of an enterprise. There is no guarantee of repayment of an equity stake as there would be with a loan. Higher risk means greater potential returns—both social and financial—in the long run. Impact investors generally fund early-stage companies that have innovative ideas and a high potential for growth, as well as more experienced firms that wish to scale their operations. In this sense, they have proven to be more flexible than traditional financiers since they are able to work more closely with the companies they support to help boost their chances of success. At the same time, impact investors benefit by progressing on social objectives that form a part of their mission (Kwolek 2012).

Enterprise finance (i.e., credit for capital or operational expenditure) in sanitation is relatively new, so there is little information on whether it works and if small entrepreneurs in the formal and informal sectors can easily access and use credit for their sanitation businesses (Trémolet 2012; Sijbesma et al. 2008). In addition, it has not yet been applied at scale, and its novelty means its sustainability is still uncertain.

Figure 2 is a schematic of the sources, delivery mechanisms, and uses of finance in the MBS space.

Figure 2: Finance sources, uses, and delivery mechanisms for MBS (not exhaustive)



Determining which finance delivery mechanism(s) to employ in a given context requires careful consideration. While the surveyed literature presents several possible end-uses of finance to facilitate MBS, there is limited operational guidance on when to use and how to determine the finance approach that will best suit the needs of a particular end-use—be it a provider or a household—or a specific country or intervention (Trémolet et al. 2010a). Factors to consider in the process include the following:

- latent or expressed demand for different levels of sanitation service;
- technical factors and market conditions driving the costs of sanitation service provision;
- income levels and geography (specifically, whether the poor are concentrated or dispersed);
- expressed willingness to pay for sanitation products and services;
- the state of local credit markets; and
- existing financing practices.

Conducting demand studies prior to designing finance schemes can help illuminate many of the factors mentioned above and inform decision making (Trémolet et al. 2010b). Employing multiple finance delivery mechanisms can be helpful in reaching all income levels within a given population (Birner et al. 2011; “Domestic Private Sector Participation in Peru Sanitation Markets at the Bottom of the Pyramid” 2011; Nattabi et al. 2015). Further, market segmentation of both customers and service providers can enable better adaptation of finance methods to different types of end-users (i.e., households and enterprises) (WSSCC and Sustainable Sanitation Alliance 2015; Pedi et al. 2012).

Before pursuing microfinance as a means of addressing the affordability constraint, funders and implementers of MBS interventions might consider non-financial measures that may be more effective at increasing investment in the sanitation sector. For instance, standardizing the land tenure status of peri-urban areas may unlock other sources of credit for households and small-scale providers (IRC and CREPA 2006). Implementers also can consider the microfinance context where they plan to operate; countries with a poorly developed or unregulated microfinance sector are often poor candidates for microfinance interventions (Davies and Tinsley 2013).

3.0 INTERVENTION CASE STUDIES

To complement the extensive review of the MBS literature presented in Section 2, we reviewed 13 past and current MBS interventions (Table 2). The analyses of intervention case studies—approaches, practices, and outcomes—contributed to the findings presented in Section 4. Identification and selection of these 13 interventions was based on a high-level rapid research assessment of project literature for the following characteristics (with additional details on the selection process provided in Annex 2):

- *Replicability*: The absence of highly unique contextual elements that limited replication.
- *Sustainability*: Interventions where market activity had been sustained, or was likely to be sustained, after the intervention terminates.
- *Availability of data*: Availability of credible sources such as project literature and/or key informants.
- *Diversity of contextual factors*.

Table 2: Summary of 13 interventions

Intervention	Duration and Budget	Key Actors	Result
Benin: Promotion de l'hygiene et de l'assainissement (PHA)	2005–2009	Funder: <i>DANIDA, Dutch Aid, GIZ</i> Lead Implementer: <i>Directorate for Hygiene and Basic Sanitation</i>	18,000 toilets sold
Bihar, India: Supporting Sustainable Sanitation Improvements (3Si)	2012–2017 US \$8.7 million	Funder: <i>BMGF, Unilever Foundation</i> Lead Implementer: <i>Population Services International (PSI)</i>	193,411 toilets sold
Cambodia: Hands-Off Sanitation Marketing (HSM)	2010–2017 US \$4.3 million	Funder: <i>USAID, World Bank, GSF, Stone Family Foundation, The Waterloo Foundation, AusAID, Ministry of Rural Development, Asian Development Bank</i> Lead Implementer: <i>WaterSHED Asia</i>	175,000 toilets sold
Cambodia: Sanitation Marketing Scale Up (SMSU)	2009–2017 US \$9.6 million (till March 2016)	Funder: <i>BMGF, World Bank, Stone Family Foundation, AusAID, Trip Advisor Foundation</i> Lead Implementer: <i>iDE Cambodia</i>	270,000 toilets sold
Cambodia: Community Hygiene Output-based Aid (CHOBA I)	2012–2016 US \$10.9 million (for Cambodia and Vietnam) ⁴	Funder: <i>BMGF, AusAID</i> Lead Implementer: <i>East Meets West Foundation</i>	50,500 low-income households benefited from a partial subsidy following 3 rd -party verification
Nigeria: Sustainable Total Sanitation (STS)	2012–2017 US \$7.4 million	Funder: <i>BMGF</i> Lead Implementer: <i>WaterAid</i>	~86,500 households triggered; 672 toilets sold ⁵

⁴ The CHOBA I program also operated in Vietnam, and disaggregated budget numbers for CHOBA Cambodia are unavailable. The Cambodia component of the CHOBA program was included and the Vietnam component excluded from our case study collection due to the selection criteria we detail in Annex 2, but its topline results are included in section 3.1

⁵ The STS program included CLTS and Sanitation Marketing approaches. STS Nigeria was recommended by an expert as a case study that could provide significant lessons despite delivering less than 10,000 in toilet sales, as we detail in the selection criteria in Annex 2.

Intervention	Duration and Budget	Key Actors	Result
Peru: Creating Sanitation Markets (CSM)	2007–2015 US \$1.77 million	Funder: <i>World Bank</i> Lead Implementer: <i>WSP</i>	~9,000 toilets sold (2007-2010)
Tanzania: Total Sanitation and Sanitation Marketing (TSSM)	2008–2011 US \$2.7 million	Funder: <i>BMGF (through WSP)</i> Lead Implementer: <i>Govt. of Tanzania</i>	16,107 Sanplats sold
Tanzania: Rural Water Supply Programme (RWSP)	2012–2016 US \$5.45 million	Funder: <i>DFID</i> Lead Implementer: <i>Govt. of Tanzania</i>	288,532 people gained access to improved toilets
Ghana: Results Based Financing for Sanitation and Hygiene (RBSFH)	2013–2016 US \$2.85 million	Funder: <i>Japan Social Development Fund (through the World Bank)</i> Lead Implementer: <i>SNV</i>	2,426 household toilets constructed
Indonesia: Indonesia Urban Water, Sanitation, and Hygiene Project (IUWASH)	2011–2016 US \$40.7 million	Funder: <i>USAID</i> Lead Implementer: <i>Development Alternatives Incorporated (DAI)</i>	300,000 people gained access to improved sanitation
Malawi: “Everyone Forever”	2011–2016 US \$32 million ⁶	Funder: <i>BMGF</i> Lead Implementer: <i>W4P</i>	Coverage change: 4% to 49% in Blantyre (urban); 5% to 56% in Chikhwawa (rural)
Mozambique: IDRC “The Latrine Project”	1979–1985 US \$38,884	Funder: <i>IDRC Canada, UNDP</i> Lead Implementer: <i>Govt. of Mozambique</i>	8,000 toilets sold

To ensure that the selected interventions adequately covered the three evidence gaps (financing, entrepreneurship, and business model), we mapped each intervention against the evidence gap areas, as reflected in Table 3.

Table 3: Mapping of reviewed interventions against evidence gap areas

Intervention	Financing	Entrepreneurship	Business Model
Benin PHA	•	•	
Bihar, India 3Si	•	•	•
Cambodia HSM	•	•	•
Cambodia SMSU	•	•	•
Cambodia CHOBA	•		
Nigeria STS	•	•	
Peru CSM	•	•	•
Tanzania TSSM	•	•	
Tanzania RWSP		•	•
Ghana RBSFH*	•		
Indonesia IUWASH*	•		
Malawi “Everyone Forever”*			•
Mozambique IDRC “The Latrine Project”*			•

* “Caselets”

⁶ Budget includes water and sanitation program components as a disaggregated budget by component is unavailable

The first nine interventions in Table 3 were examined in depth, beginning with a focus on the market barriers that the interventions addressed, as well as the strategy used to address them. We sought to understand the intervention approaches and their evolution from design through implementation, the factors that enabled or challenged implementation, and interactions among various actors in the market.

The last four interventions listed were crafted as “caselets”—more narrowly-focused case studies with specific evidence gaps for review: Indonesia and Ghana with respect to financing, and Malawi and Mozambique with respect to business models and products. The case study analyses consisted of both desk reviews and interviews with personnel involved in implementation (e.g., program managers) or strategy/direction (e.g., funders, country managers), or else with researchers who had closely studied or evaluated the intervention.

While we initially organized the research, including similarities and possible counterfactuals in the interventions’ approaches and impact, around the three evidence gaps situated in the broader enabling environment and context, the analyses yielded a consistent finding: successful MBS interventions systematically addressed **barriers** that inhibit **scale** (represented by *more* customers and *more* entrepreneurs participating in the sanitation market, known as greater “market depth”). Following on “*Shaping Inclusive Markets*,” (Koh et al. 2017) an analysis of how change happens across a market system, we kept the aperture of our analysis sufficiently broad to allow detection of activity related not only to the core demand-supply interaction, but also to the realms of market rules and social norms. In this section, we present top-level findings from our case study analysis. Further detail from the case studies on approaches to address barriers inhibiting scaling of sanitation markets is provided in Section 4.

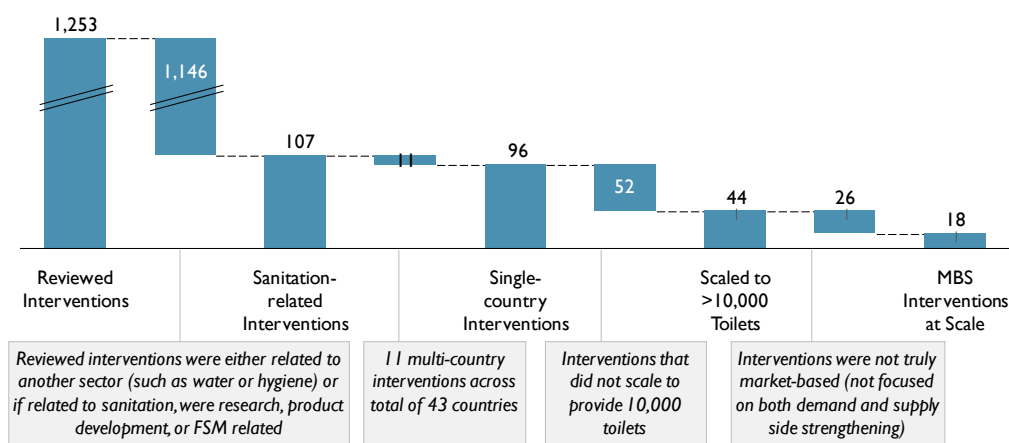
3.1 WHAT DO THE NUMBERS TELL US ABOUT MBS INTERVENTIONS?

While our principal intention was a systematic process of reviewing MBS interventions (rather than to compare outcomes), we did conduct a cross-intervention analysis indicating that, even though few MBS interventions have scaled, they do offer some promise when measured with respect to cost and time to scale.

3.1.1 Top-Level Finding I: Few “True” MBS interventions have scaled

From the sample of 107 *prima facie* MBS interventions to promote household purchase of toilets, only 19% of single-country interventions scaled to 50,000 households (18 out of 96 single-country interventions).

Figure 3: MBS interventions at scale



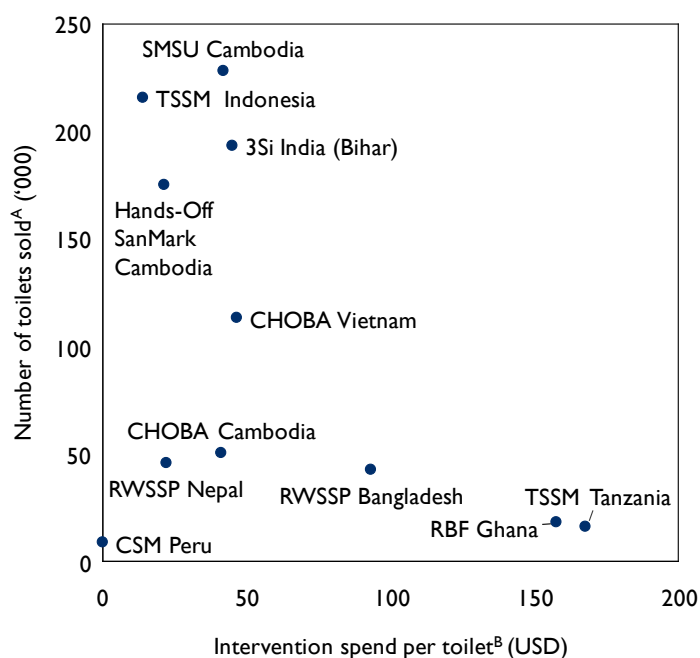
Note: Interventions at scale of >10,000 toilets do not include multi-country interventions. The figures above are based on availability of data on interventions, which were part of a systematic review of 1,253 interventions in the sanitation sector. See Annex 2.

Even if we lower the threshold for what is considered “scaled” to 10,000 households, (admittedly a low number considering the scale of the global sanitation challenge), only 45% of single-country interventions (44 single-country interventions out of 96) crossed that mark (Figure 3). Among the 43 countries covered by 11 multi-country interventions, interventions had scaled to more than 10,000 households in 14 countries. A closer look at the single-country interventions that have reached more than 10,000 households reveals that fewer than half were truly market-based—that is, they both unlocked household investment and strengthened the private sector. The rest were either heavily-subsidized or relied on short-term hardware supply by the government or donors, a course that is unsustainable in the long-term.

3.1.2 Top-Level Finding 2: Among MBS interventions at scale, there is considerable variance in cost to scale

A plot of the scale of the intervention as a function of spending per toilet sold illustrates that a majority of interventions in our sample were able to scale (sell more than 10,000 toilets, by our operational definition) by spending roughly US \$20 to \$50 per toilet delivered (Figure 4). (Note that these amounts include only the programmatic expenditure and not the customer expense for procuring the toilet.)

Figure 4: Scale and cost of MBS interventions



Notes: The analysis is based on a sample of MBS interventions reviewed with publicly available data. For more details, refer to Annex 3; A. Number of toilets sold as reported or estimated from households or population impacted; B. Intervention spending per toilet as reported or estimated from intervention budgets and toilets purchased. This figure accounts only for amounts spent by the intervention (as reported) and does not include the household’s expenditure on purchasing toilets or funds from other sources (e.g., government subsidy programs). The types of cost included in intervention spend may differ by program due to variations in reporting methods.

3.1.3 Top-Level Finding 3: If funders stay invested, interventions can scale up

While there are few examples of at-scale MBS interventions, and the programmatic cost for these interventions varies, the time-to-scale data suggest that, with continued funding in some contexts, MBS interventions can scale in a relatively short period. Most of the successful examples observed in our study reached scale in 4 to 6 years, and some facilitated sales of more than 100,000 toilets during that

period (Figure 5). Further, a year-by-year study of toilets sold in selected interventions suggests that sales begin to accelerate 4 to 5 years after the initiation of the intervention (supporting the argument to extend the typical donor funding cycle of 3 to 5 years) (Figure 6).

Figure 5: Time to scale for MBS interventions

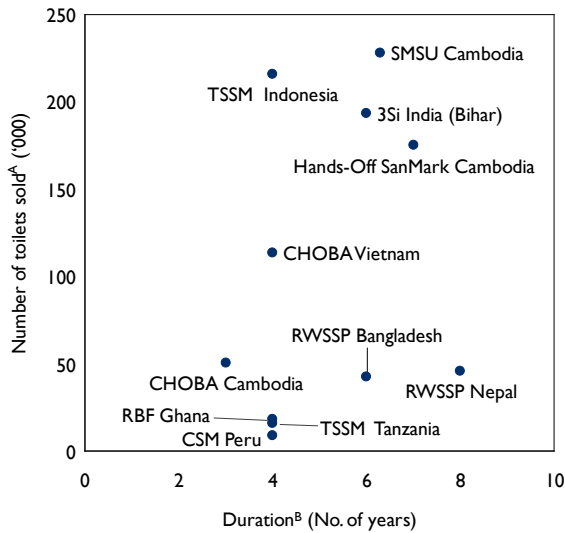
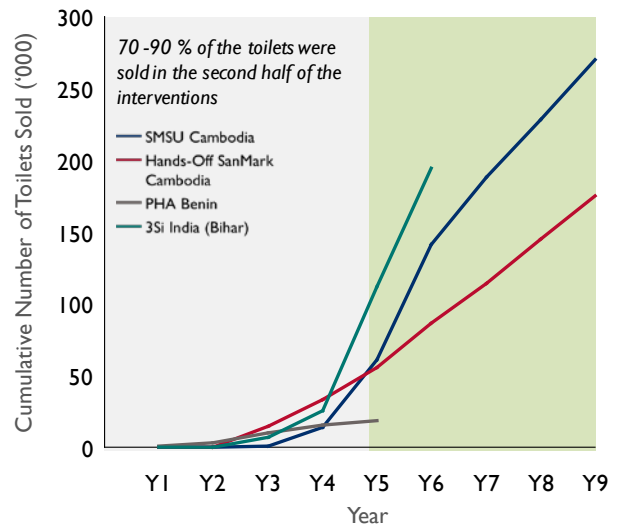


Figure 6: Inter-annual trend of toilet sales for select MBS interventions



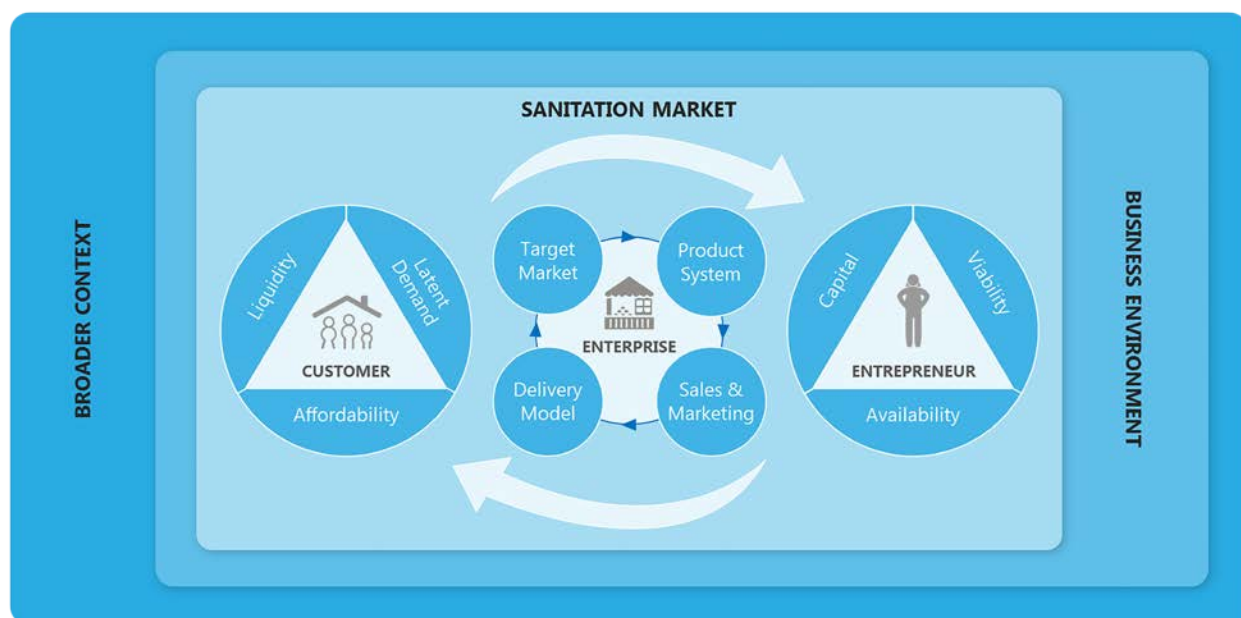
Notes for Figure 5: The analysis is based on a sample of MBS interventions reviewed with publicly available data. For more details, refer to Annex 3; A. Number of toilets sold as reported or estimated from reported households or population impacted; B. Duration refers to the period between the start of the program and the year the latest data on toilets sold was available.

Notes for Figure 6: Year 1 for the interventions is as follows—SMSU Cambodia: 2009, Hands-Off SanMark Cambodia: 2009, PHA Benin: 2005, 3Si India (Bihar): 2012. 3Si Bihar's example uses data until Q2 2017 for year 5.

4.0 THE SANITATION MARKET SYSTEM

Our survey of the MBS literature and analysis of selected MBS case studies made clear that, while the focus of these interventions tended to be the sanitation *market* (the interaction between buyers and sellers), successful interventions also sought to bring about change in the broader sanitation *market system* (e.g., associated supply chains and such supporting functions like the financial services infrastructure). To apply this systems lens to MBS, we present a “framework” for MBS interventions that specifies the various levels at which stakeholders should intervene to bring about systems change (Figure 7).

Figure 7: The Sanitation Market System – Framework for MBS



Market and Market System—What is the difference?

According to the Making Markets Work for the Poor (M4P) approach, a **Market** is “a set of arrangements by which buyers and sellers are in contact to exchange goods or services; the interaction of demand and supply.” Alternatively, a market comprises buyers and sellers. In the above figure the market is represented by the customer, the sanitation enterprise, and the entrepreneur.

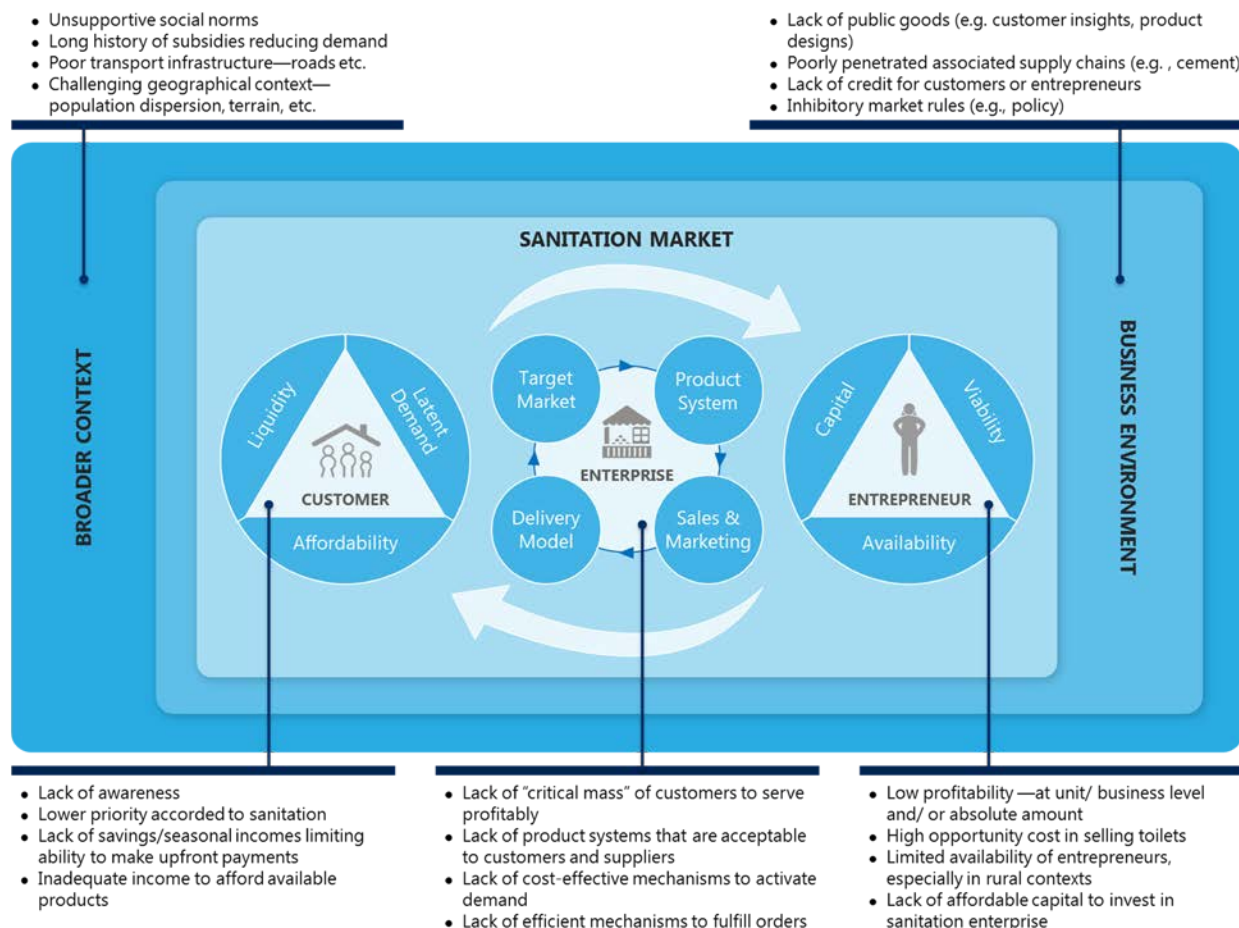
A **Market System**, meanwhile, is “a multi-function, multi-player arrangement comprising the core function of exchange by which goods and services are delivered **and** the supporting functions and rules which are performed and shaped by a variety of market players.” A market system therefore comprises value chains and supporting functions (e.g., banking system, infrastructure) that enable the market to function. The market system also includes formal rules (e.g., laws, standards) and informal rules or norms that influence interactions and outcomes.

See The Springfield Centre (2015), *The Operational Guide for the Making Markets Work for the Poor (M4P) Approach*, 2nd edition funded by SDC & DFID for a more detailed explanation of the components of a market system.

The framework specifies three distinct domains of the sanitation market system, based on degree of influence in each domain from an intervener’s (funder and implementer) perspective: **context**, which interveners can understand but typically cannot influence; **business environment**, which interveners may potentially influence depending on the complexity and resources available; and the **sanitation**

market, which large-scale interventions largely have the capacity to address. The existence and severity of barriers, or absence thereof, across the sanitation *market system* determines the depth of that market (Figure 8).

Figure 8: Barriers to scaling MBS across the sanitation market system



At the center of the framework is the **sanitation market**, with the business—the mechanism that facilitates the exchange of products and services between entrepreneur and customer, also known as the “**sanitation enterprise**,” at its core. Sanitation enterprises must attract enough customers (a “critical mass”) to operate profitably. Selection of a *target market* is based on its perceived ability to service these customers profitably, and to do so, a sanitation enterprise must understand what the customer values, and design an appropriate *product system* that responds to those values.⁷ Having designed an appropriate product system, the sanitation enterprise then needs to provide the customer with information and impetus to purchase via *sales and marketing*. Once the purchase happens, a *delivery model* organizes the various supply chain components to get the product to the customer cost-efficiently. More detail on the design and functioning of sanitation enterprises is offered in section 4.1.

Similarly, customers and entrepreneurs may be confronted with a distinct set of barriers, which, individually or in combination, hinder their participation in the market (Figure 8). Customers may lack

⁷ Product system or product refers to the substructure components (e.g., pit, septic tank), interface (e.g., slab, pan, water closet), and/or superstructure components (e.g., walls, roof, door)

income or savings to afford toilets that are available in the market (the “affordability” barrier); they may have unstable or seasonal income that prevents them from making the full payment upfront (“liquidity” barrier); or they may have an interest in purchasing toilets but do not translate this interest into a purchase for a range of reasons (“latent demand” barrier). Mechanisms and practices to overcome barriers to customer participation are discussed in more detail in section 4.2.

On the supply side, low profitability of selling toilets may discourage entrepreneurs from entering or continuing to operate in the market (the “viability” barrier), or entrepreneurs may lack the capital required to invest in the sanitation enterprise (the “capital” barrier). The availability of entrepreneurs with attributes (e.g., skills, assets) necessary to build or sell toilets may be limited (the “availability” barrier). The sanitation enterprise may act on some of the customer-related barriers. For example, product systems can be designed to reduce costs and thus improve affordability for customers and viability for entrepreneurs. Similarly, sales and marketing that effectively appeals to customers’ desires and needs can enhance their willingness to buy. Approaches to improve viability of sanitation enterprises, increase access to enterprise capital, and widen the availability of entrepreneurs are discussed in section 4.3.

The functioning of a sanitation market is governed by the broader **business environment**. The business environment is shaped by factors such as the availability of non-excludable public goods (e.g., market information on product designs in the public domain); the state of associated supply chains (e.g., availability and price of construction raw materials used to build toilets); the state of financial services infrastructure, which affects the availability of credit for customers and entrepreneurs; and business-related laws, regulations, and policies (e.g., government programs to provide in-kind hardware subsidies). Sanitation enterprises may leverage specific elements of the broader business environment in their favor or they may adapt to the constraints placed by the business environment. Governments, funders, and even implementers, however, may have the resources (i.e., funds, networks, and perceived neutrality) to influence them, including the ability to lead advocacy efforts that change market rules in favor of MBS. The factors within the business environment that enable or impede scaling of sanitation markets are discussed in section 4.4.

Social norms or informal rules can be as powerful as market rules, or even more. The broader context, beyond the commercial activity related to sanitation, in our framework encompasses social norms, infrastructure, macroeconomic factors, and environmental factors, which represents enablers or barriers that tend to shift slowly and can lie outside the influence of funders or implementers. Contextual elements that impact sanitation markets are explored in section 4.5. Together, the context and the business environment are key determinants of the applicability of MBS and its outcomes.

Finally, an essential (and less well-documented) part of the equation is the way outcomes are defined and measured. In Section 5, we explore the principles and process for monitoring, learning, and evaluation (MLE) that argue for continuous learning and adaptation of MBS interventions as well as metrics that should be measured to confirm that sustainable change is taking place.

Enterprise, Entrepreneur, and Business Model— How are they related?

An **enterprise** is a business that facilitates the interaction between customers and *entrepreneurs* in a market.

A **business model** defines the specific manner in which a single *enterprise* creates and captures value in the marketplace.

An **entrepreneur** is an individual who owns and manages an enterprise. A sanitation enterprise may be a part of an entrepreneur’s broader portfolio of related or unrelated enterprises.

The focus of this report is to understand the barriers at a category level (i.e., all enterprises in the market), hence on the functioning of the sanitation enterprise rather than specific business model(s).

4.1 BARRIERS TO FUNCTIONING OF THE SANITATION ENTERPRISE

The sanitation enterprise is a business that delivers goods and services to a paying customer, generating a financial return to the business owner. In this section, we discuss the core elements—and the barriers therein—of a sanitation enterprise. Since the elements of the sanitation enterprise interact with each other as well as act upon some of the barriers to greater customer and entrepreneur participation, the design of the sanitation enterprise is an iterative process. Ideally, the process begins with target market selection, which determines the other elements of the sanitation enterprise—product system, sales and marketing, and delivery model. However, interventions sometimes must work with existing sanitation enterprises that may have already made choices about these elements.

4.1.1 Target Market

In Peru, 3.4 million households lacked improved toilets in 2014, and most of these households were interested in purchasing a toilet, including superstructures. Nonetheless, WSP’s “Creating Sanitation Markets” intervention identified only 500,000 households as the target market to the domestic private sector, consisting of large suppliers of components and materials for constructing toilets, including the superstructure (Balcazar et al. 2015). The target market represented “early adopter” households that could be tapped and served by these suppliers with relative ease. Target households had the financial capacity and willingness to purchase toilets, many had access to water and sewerage networks for connecting toilets, and lived in accessible urban/peri-urban areas. Another 1.9 million were pitched as a potential market that would require additional product and financing innovations, while the remaining million (bottom 30% of the population) were excluded since they would require subsidies.

Careful target market selection, both in terms of geographic location and customer segmentation, helps persuade existing or potential commercial players in the local sanitation value chain of an immediate and viable opportunity. Sometimes, persuading a few entrepreneurs of an opportunity can convince others to enter the market as well. As an illustration, only two sanitation enterprises initially sold *Easy Latrines* in Kandal and Svay Rieng provinces targeted by the iDE intervention in Cambodia. Inspired by the success of these pioneers, other entrepreneurs soon adopted the model, and over time, many sanitation enterprises expanded geographically to target early adopters in surrounding villages (Pedi et al. 2012). Similarly, WaterSHED’s program, also in Cambodia, recruited entrepreneurs to produce an affordable toilet, and the success of these initial entrepreneurs encouraged other entrepreneurs in the market.

Target market selection extends beyond socio-economic dimensions to include such factors as the following:

- **The number of customers who demonstrate interest in building, upgrading, or replacing a toilet**, rather than in merely ceasing open defecation (Devine 2009). Of Cambodian households without toilets, 77 percent had considered or were considering purchasing or constructing a toilet prior to the MBS interventions by iDE and WaterSHED (Roberts et al. 2007b).
- **Willingness and capacity to purchase toilets with savings and/or cash equivalents** (e.g., credit, partial subsidy). “Early adopters” in Cambodia comprised households that had funds available and were willing to purchase a new toilet.
- **Ease of access for local suppliers** (e.g., located in the same village, proximity to roads, or distance from district/regional capitals). The Supporting Sustainable Sanitation Improvement (3Si) intervention in Bihar, India, for example, targeted districts where customers had access to suppliers for a variety of inputs within five kilometers. In Cambodia, the WaterSHED intervention started by targeting villages located within 10 kilometers of the main road where partnering businesses were located.

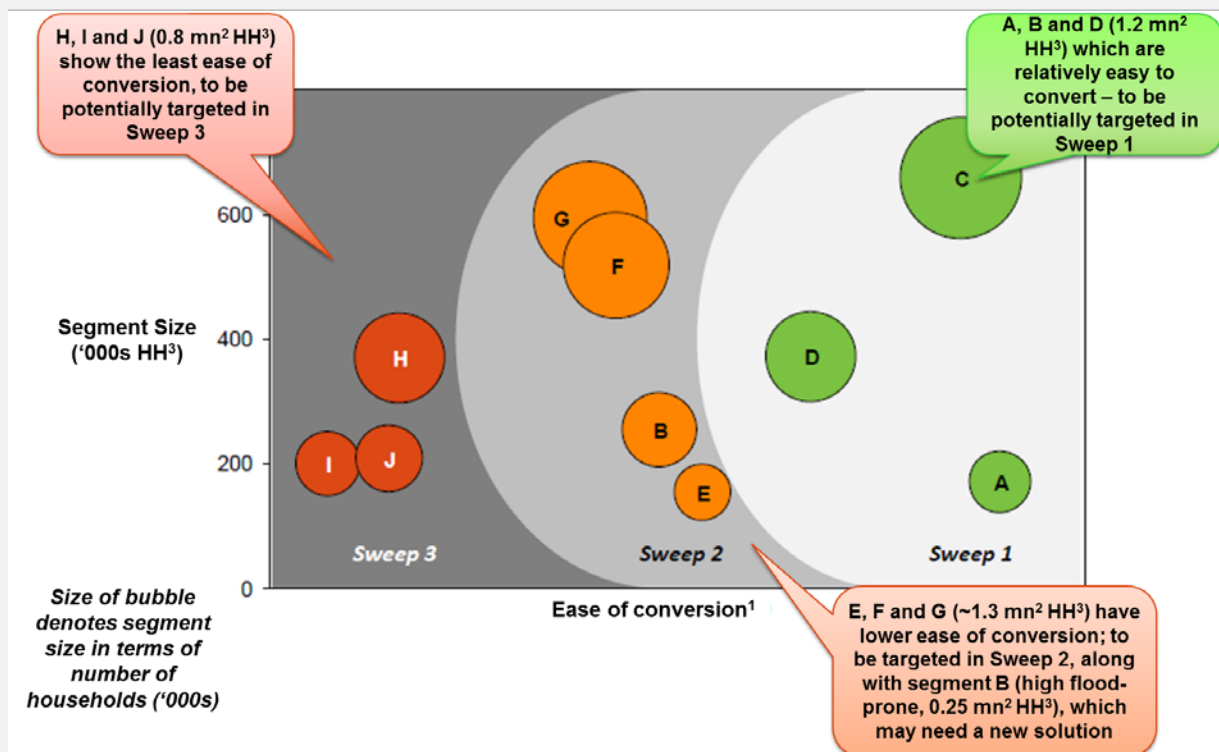
- **Extent of innovation required** (e.g., new product solution, new financing solutions) to activate demand. In Mozambique, a low-cost sanitation project targeted the city of Maputo, where 90 percent of customers had access to unimproved pit latrines (Brandberg 1997). The project therefore focused on designing a low-cost concrete slab as an add-on to improve existing toilet interfaces rather than on developing an entirely new product (though the project did have to develop substructure variants appropriate for differing soil and water table conditions throughout the city).

Initial selection of a target market as a subset of the overall market often aims to capture “early adopters” (customers with a high propensity, ability, and willingness to pay for a toilet) and ability of sanitation enterprises to service these markets. That does *not* mean that the rest of the market is ignored completely; as the reach and scale of the sanitation enterprise increases, other target markets can be targeted in successive phases or “sweeps” to improve and sustain the viability of the sanitation enterprise.

Box 1: Target market selection and the “sweeps” approach in 3Si Bihar

The 3Si intervention in Bihar developed a score for ease of conversion of different markets by combining a qualitative assessment of willingness to purchase a toilet, affluence as an indicator of ability to pay for a toilet, and share of households living in flood-prone areas as an indicator of difficulty of using existing toilet options. Based on the ease of conversion score and size (measured by geographic units of blocks, which each have approximately 30,000 households), markets were grouped for targeting by the private sector in three successive “sweeps.” Sweep 1 was targeted with existing toilet designs; Sweep 2 required new designs for customers in flood-prone areas; and Sweep 3 required substantial financing or subsidy support due to their inability to pay. (Monitor Deloitte 2012)

Figure 9: Target market selection and sequencing in the 3Si intervention in Bihar, India



Box Footnotes: 1. Composite rating of Willingness to Purchase, Affluence and Safety from Floods; 2. Population in given segments across the intervention’s eight innovation districts; 3. Households

The “sweeps”⁸ approach helped sanitation enterprises in Peru and Cambodia realize the potential market opportunity and commit to longer-term involvement. Early adopters, targeted in the first sweep, helped drive acceptance of new sanitation enterprises and toilet designs by the wider market, whose preferences and aspirations are often shaped by observing usage by neighbors and receiving word-of-mouth recommendations. For example, WaterSHED’s assessment in Cambodia found that approximately 75 percent of customers had recommended the toilet design to their social network and nearly 20 percent of customers had purchased the toilet because their neighbor had bought one (Pedi et al. 2014). The inclusion of relatively higher-income households as “early adopters,” even if they do not represent the largest opportunity, is a strategy adopted by sanitation enterprises in Cambodia, Peru, and Bihar, India.

As the example of 3Si Bihar (Box 1) illustrates, targeting different markets may entail selling different products. Indeed, the target market is a key determinant of what the sanitation enterprise should look like—what products, delivery model, and sales and marketing mechanisms it should adopt initially. For instance, targeting higher-income households in Cambodia, Peru, and Bihar was enabled by customizable product systems that included options with higher-end materials and features (e.g., superstructure, second pit), as well as by social marketing campaigns that were designed to target higher-income households. In the Promotion de l’hygiène et de l’assainissement (PHA) intervention in Benin, literacy rates among the target market selected were low, necessitating the use of image-based sales and marketing materials.

4.1.2 Product System

How did a pour-flush toilet become so popular in Cambodia that it sold more than 445,000 units⁹ in a span of seven years? Prior to 2009, customers were not willing to buy toilets, ostensibly since their “ideal toilet” was unaffordable. In 2009, Jeff Chapin, on a sabbatical from the leading design firm IDEO, joined an initiative led by iDE Cambodia, the Ministry of Rural Development, LienAid, and WSP, among others, with the goal of developing a toilet based on existing sanitation technologies that a majority of Cambodians could find desirable and afford to own. Adopting a Human-Centered Design (HCD) methodology, the team interviewed customers for user insights and preferences, tested and iterated on prototypes with customers, and sought input from local suppliers. Four months and multiple prototypes later, the team arrived at a ready-to-install, pour-flush pit latrine design package kit known as the latrine core (branded as “Easy Latrine” by iDE), which became popular with both rural customers and sanitation enterprises.

Many sanitation programs, market-driven or otherwise, struggle to convince households to adopt toilets due to undesirable and/or unaffordable products on offer. The experience in Cambodia underlines the potential importance of iterative and inclusive design by going beyond technology considerations to incorporate customers’ and suppliers’ perspectives. Thoughtful product design approaches in other markets have boosted toilet purchases due to several design process elements.

Formative market research with customers and supply chain actors helps uncover the initial set of factors to guide development of preliminary prototypes. In Cambodia, demand-side assessments identified a very strong preference for comparatively expensive pour-flush latrines and an aversion to lower-cost dry toilets (Salter 2008). At the same time, a majority of potential customers surveyed were only willing to pay US \$10 for a hygienic toilet (Pedi et al. 2012). These and similar insights contributed to the definition of a design brief and initial range of prototypes for testing with customers.

⁸ In the Cambodia context, the “sweeps” approach, as adopted by iDE, initially resulted in entrepreneurs moving across geographies primarily targeting households that had a high propensity to purchase. In this document, however, the term “sweeps” is used to describe a phased approach whereby the enterprise adapts to the diverse preferences and constraints of different customer segments.

⁹ Based on sales numbers reported by iDE and WaterSHED in Cambodia.

Iterative processes actively seek and incorporate feedback on prototypes from customers at multiple stages of product development. Such processes actively employ tools such as graphic overlays, prototypes, images, and scale models to solicit detailed feedback on visual aesthetics, material composition, and features, as well as issues around transportation, installation, maintenance (e.g., pit-emptying, flooding), and cost. The Cambodian prototype was developed and tested over four rounds, with each round adjusting for features and materials composition (Wei et al. 2014). Similarly in Bihar, the prototype was developed and tested over three iterations (Drolet 2015).

Involving value chain players in the prototyping process is important to ensure cost-efficient production and a viable product price. Thus, prototyping processes also consider feedback from those players, since products have to be fabricated with locally available skills, equipment, and materials. Sanitation enterprises in WaterSHED and iDE's programs in Cambodia, WaterAid's program in Nigeria, and 3Si in India featured new product designs because the designs leveraged the experience of entrepreneurs in concrete product fabrication and required limited additional investment (e.g., molds to cast the substructure components).

Some local sanitation enterprises may over-engineer toilet substructures and interfaces due to lack of consumer understanding and/or poor production techniques, which can raise costs unnecessarily. For example, cement ring manufacturers in Cambodia traditionally built concrete pit rings with nearly double the required thickness, raising material costs and product prices substantially (Pedi et al. 2012). Options for achieving production efficiency include the following.

- **Product reengineering** to reduce input materials or incorporate lower-cost alternatives while maintaining durability. For example, during the development of *SanPlat* in Mozambique, materials reduction lowered the weight of the slab by 90 percent while maintaining structural strength (Brandberg 1991). In the 3Si program in Bihar, the initial price of toilets, including the superstructure, in 2013 averaged US \$300 and they took an average of 70 days to install. The use of a pre-fabricated concrete roof to replace conventional roof construction methods and PVC doors to replace wooden doors (which created substantial delays and cost escalation) reduced time to completion to 13 days, reduced costs to approximately US \$250, and delivered higher quality. Of course, radically new concepts need to be tested for acceptance by customers and suppliers. In Cambodia, the toilet design reduced costs substantially, but suppliers ultimately rejected innovations such as rice husk ash concrete and tapered ring designs.
- **Efficient production techniques.** For example, in Cambodia, the adoption of two outer molds and one inner mold tripled production capacity to nine rings per day (iDE 2010).
- **Standardization** of certain product elements, such as the building blocks of substructure, as was done in WaterSHED and iDE Cambodia, 3Si India, and WaterAid Nigeria.
- **Leveraging subsidy.** Net cost to customers can be reduced by incorporating or meeting specifications of subsidy programs. The product offered in Bihar, for instance, fulfilled the specifications (substructure for safe containment of feces, a superstructure, water, and hand-washing facility) of the national government's *Swachh Bharat mission* for household toilet rebate subsidy of approximately US \$200.¹⁰

¹⁰ Swachh Bharat Abhiyan (Clean India Mission) is a campaign by the Government of India that aims to achieve the vision of a "Clean India" by 2019. The campaign focuses on sanitation and maintaining a hygienic environment. In urban areas, the focus is on building individual toilets, community toilets, and solid waste management facilities. In rural areas, the emphasis is on eliminating open defecation and building toilets through behavioral change interventions and strengthening implementation and delivery mechanisms. Funds are also provided for Solid and Liquid Waste Management (SLWM).

- **Simplified installation.** Enabling easier installation by customers resulted in lower installation costs. Self-installation was enabled by ready-to-install toilet packages or by communicating instructions on materials procurement and construction process. For example, a 2008 supply-side assessment in Cambodia found the labor cost alone (i.e., not including materials and components) of installing a toilet substructure to be US \$25 to \$50 (Salter 2008). The *Easy Latrine* substructure carried a total price tag of US \$35, which included a ready-to-install substructure package and home delivery (Rosenboom et al. 2011).

Some flexibility in products offered (substructure, superstructure, or both) is required to address the different willingness to pay levels and functional/aesthetic preferences of multiple market segments. In the WaterSHED and iDE Cambodia, 3Si Bihar (India), and WaterAid Nigeria programs, even though the core substructure was standardized, sanitation enterprises could still offer customization by adding additional rings for deeper pits, a second pit, different slab materials (e.g., mud, cement, tiled), or different pan types. In Mozambique, five sanitation platform (*SanPlat*¹¹) variations were developed to adjust for different soil and water table conditions. More often than not, a range in superstructure options is more important than substructure, since customers tend to have a broader range of functional and aesthetic preferences for the superstructure elements.

Some observers caution that too many options also can complicate and overwhelm customers' decision making, leading them to postpone the purchase decision. Many customers in 3Si Bihar, when presented with three product options (number of pits that can be installed and superstructure elements such as tiles, doors etc.), gravitated toward the most expensive model and decided to defer their purchase until they thought they could afford it, rather than opt for the base model. Sales of the base model increased only after the expensive models were removed from the market. In addition, offering multiple options—especially for the superstructure or slab—can negatively affect viability of sanitation enterprises by increasing inventory costs (costs of stocking inventory of components such as tiles, doors, etc.) and complicating the sales process.

Once a product system is in place, meets customer needs and preferences, and suits the entrepreneur's capabilities and preferences, *demand activation* is required to convert customer interest in a sanitation product into a decision to purchase. In the next section, we explore the concept of demand activation in depth and explain how it shapes customer motivations and communicates information about the product and its availability with the objective of persuading the customer to buy a toilet.

4.1.3 Sales and Marketing

In Bihar, PSI mobilized sales agents from communities, calling them Toilet Motivators, to raise awareness and persuade households to buy toilets. Toilet Motivators were typically people with good communication skills who had other occupations (such as a barber or a tea vendor), and were known to potential customers. Toilet Motivators held group meetings and went door-to-door to persuade households to purchase improved toilets from local sanitation enterprises. PSI paid Toilet Motivators a variable commission depending on the number of toilets sold (between US \$1.50 and \$2.30 per toilet).¹² PSI introduced the Toilet Motivators to sanitation entrepreneurs and initially supported Toilet Motivators in closing deals with households.

Various methods of marketing have been tried in MBS programs, including mass marketing, toilet demonstrations, branding, and interpersonal communication (IPC). Word-of-mouth recommendations by satisfied customers can be crucial for persuading community members who are neutral about

¹¹ A latrine slab design that has a key-shaped drop hole, which is large enough to prevent staining but small enough to be child safe; elevated footrests; smooth and sloping surfaces draining towards the hole, and a tight-fitting lid.

¹² Converted from INR 100-150 at an exchange rate of INR 65/US \$ and rounded to the nearest ten US cents.

improved sanitation. Mass marketing or one-way communication channels (e.g., billboards, television, radio, posters), while useful for targeting early adopters, may not address the variety of customers' concerns and tend to be expensive. For example, fewer than five percent of customers surveyed by WaterSHED in Cambodia cited posters and leaflets as a source of information (Pedi et al. 2014). In Tanzania, print ads, radio jingles, and radio soap operas were employed but required funding from the government and donors, and their effectiveness was not measured (Robinson 2011). Demonstration of toilets is most appropriate when deployed in situations where customers are not familiar with improved sanitation or to dispel fears around a new technology or product.

Funders and implementers have considered product branding to support sales and marketing for sanitation enterprises. The objective of branding *Easy Latrine* by iDE in Cambodia and *Mi Baño* in Peru was to build customer recall, communicate product information to customers without technical, non-user friendly terms, and, in some cases, attract entrepreneurs to the sanitation market (as better brand recall can be linked to sales growth (Clarke 2009)). In both markets, an "umbrella" brand was developed to convey product information on behalf of multiple sanitation enterprises (small concrete product manufacturers in Cambodia and a consortium of large, national-level toilet component manufacturers in Peru). Brand management on behalf of multiple suppliers, however, was found to be expensive and complex.

Box 2: Product branding in Mi Baño, Peru

The “Creating Sanitation Markets” intervention in Peru, partnered with SNI, the Peruvian national industry association, to develop an umbrella brand—Mi Baño. Under the Mi Baño association, the Peruvian industry association (SNI) and 11 large private sector companies (e.g., PAVCO, Union, Eternit) that supplied construction materials and hardware products were engaged to deliver bundled products and services. The members’ committed contribution was projected (at 2 percent of the product retail price) to be approximately US \$550,000 per year.¹³ This was expected to finance the association’s operations and brand management activities and was supplemented by cash/in-kind contributions from non-partner stakeholders (public, private, or civil society organizations), who linked their interventions to the Mi Baño brand.

The Mi Baño brand association was challenged by financial and management issues. First, actual sales were far lower than projected sales, which reduced contributions toward brand management. Second, the association members committed to funding the brand with only suggested monthly contributions. Collecting funds on a monthly basis proved difficult.

Finally, the fact that partner businesses were often large multinationals also meant that overall processes were slowed down, as these companies needed approvals from their home offices on the association’s proposals and activities before they could make decisions. Eventually, the association became inactive even though association members continued their partnership and marketed the bundled product and services. (Image credit: World Bank)



iDE’s *Easy Latrine* brand initiative in Cambodia did not plan for contributions from sanitation enterprises and depended on external funding. The implementers did not meet a core brand objective—building customer recall and attracting new entrepreneurs to set up sanitation enterprises—leading to the suspension of further investments in the *Easy Latrine* branding strategy following a two-year pilot phase. In Peru, *Mi Baño* had similar results, leading the brand to become dormant (Box 2). Both experiences suggest that product branding, while promising in theory, is difficult to manage and may have limited utility considering the costs involved.

Interpersonal communications in small group settings (e.g., village meetings) and/or one-to-one communication have been found to be relatively more effective for activating demand (Rios and Jenkins 2013). Both group and individual settings are typically supported with printed visual communication materials (e.g., flip charts, posters, image cards) that incorporate context-specific emotional or functional messages (e.g., disgust, status, privacy) to persuade customers to purchase or construct a toilet.

To overcome enterprise reluctance to actively market, demand activator models in which independent agents generate sales for sanitation enterprises, typically in exchange for a commission, have shown some promise. The role of demand activators included elements of demand *fulfilment* as well: collecting

¹³ Estimated based on data provided in an interview on sales projections, average retail price of 3 models at US \$750, and contribution from *Mi Baño* members.

payment/deposits and tracking usage. For example, iDE's agents in Cambodia were engaged in collecting deposits, while *Relais Communautaires* (volunteer hygiene promoters) in Benin kept track of households' progress from expressed interest in a toilet all the way through construction and use.

IPC activities are typically time-intensive, and as a result, in many cases enterprises do not actively market and sell their products; instead, they rely on inbound inquiries. For example, iDE initially included sales training for entrepreneurs, but did not find traction.

Box 3: Demand activators in Cambodia

In the model promoted by WaterSHED and iDE in Cambodia, paid sales agents affiliated with local sanitation enterprises typically conduct village meetings where they speak about the impact and financial costs of unhygienic sanitation and the benefits and features of the toilet.

These agents go door-to-door and have individual conversations with potential customers who do not place an order immediately. In these one-to-one interactions, sales agents discuss individual customer's problems such as privacy, status, health, etc. Agents position the toilet as a solution to customers' problems and address objections or barriers to purchase raised by the customers.

Sales agents employ tools such as a flip book that speaks to the most common drivers to toilet purchase (surfaced through consumer insights research), as well as training cards with responses to frequently asked questions or objections raised by customers. In the iDE intervention, sales materials to support conversations between sales agents and customers were developed in collaboration with Whitten & Roy Partnership, a specialized sales consultant, while the visuals were developed after testing customers' reactions to images and messages ranging from shame to disgust.

Image credit: iDE Cambodia

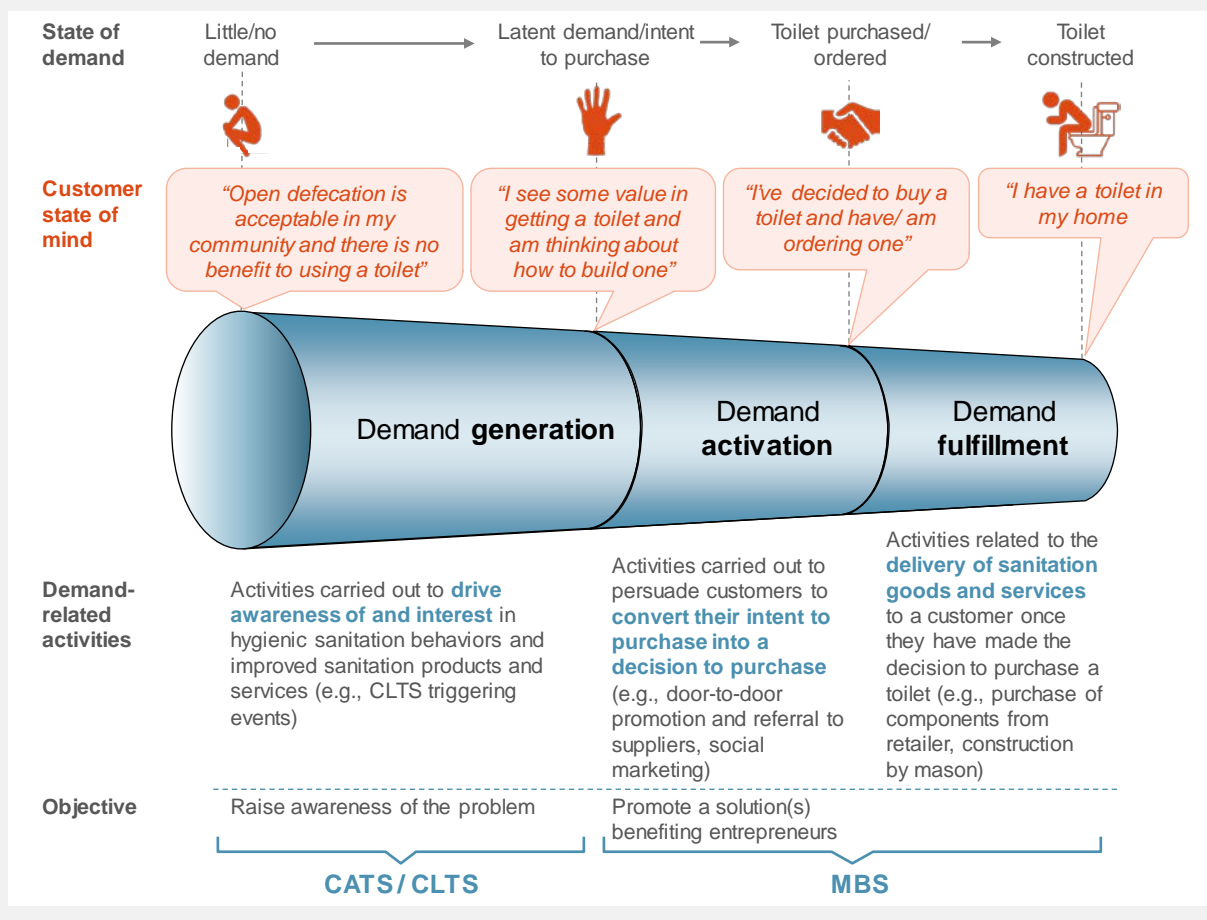


Demand Generation vs. Demand Activation—What is the difference?

Demand *activation* is an essential element of a sanitation enterprise, and differs from demand *generation*. The objective of demand generation is to make a customer aware of the benefits of a toilet and to generate general interest in buying one, often by connecting with deep motivations such as comfort, safety, convenience, or prestige rather than health benefits alone. The objective of demand activation is to convert that interest into a decision to purchase. Without demand activation, a customer who has been triggered in the context of CLTS, for example, might not make a purchasing decision despite her newly generated awareness and interest. Figure 10 depicts the customer journey through the different phases of demand generation, activation, and fulfillment.

In our formulation, MBS is not meant to generate demand, but in practice, MBS interventions may undertake demand generation strategies in parallel (or in sequence) with demand activation measures. While Figure 10 shows MBS as conceptually following CATS/CLTS, the sequencing of these approaches is not necessarily straightforward.

Figure 10: Phases of customer demand



Optimally, demand activators possess persuasion skills, persistence, access to a community network or influence, and an ability to generate trust. While demand activators are usually paid commissions for sales, we differentiate the following three archetypes of demand activators by their primary incentive – monetary or otherwise.

- **Professional agents** include locally well-networked community members, recent graduates, college-dropouts, or even experienced salespeople with an aptitude for communication. They are

motivated by the opportunity to earn commissions as a primary or supplementary source of income. In both iDE's Cambodia intervention and 3Si Bihar, some agents worked full-time while others had primary occupations ranging from farming to informal business. The full or part-time employment opportunity also was a motivator, especially where few alternatives were available, as exemplified by young, college dropout women in Cambodia. Professional agents tended to target only "early adopters," conducting a few village or group meetings to target customers who were willing to buy and making little attempt to persuade other customers. Another challenge arose when familiarity and social status were particularly important to customers (which might have hindered agents not from the village or else held in low standing). Agent attrition also was a problem if demand (and in turn, commissions) was low. For example, iDE Cambodia experienced high sales agent attrition until it took over active management of the sales force and provided higher compensation.

- **Community opinion leaders** include those in formal, influential positions, such as heads of villages, as well as individuals whose status give their opinions greater weight and who are seen as trusted sources of information. While leaders in WaterSHED's Cambodia intervention received commissions for toilet sales directly from sanitation enterprises, money was neither their key incentive nor their main source of income. These traditional leaders were invested in developing the community, driven by the possibility of being elected to local and regional positions, and/or were motivated by the objective of a public declaration of open defecation free (ODF) status under government or donor interventions. While these leaders may be physically limited to their village or area of influence, they tend to be persuasive and follow up with households that expressed intent without actually purchasing toilets.
- **Community influencers** include respected and trusted members of the community. Such individuals do not hold official or traditional leadership positions but exercise or enjoy influence over their peers. Community influencers like the *Relais Communautaires* (RC) in Benin conducted community-level and door-to-door demand activation activities to persuade households to construct toilets as part of a government-led intervention. RCs were nominated by the community and did not receive financial incentives for their role, but did receive training and recognition from the government in the form of rewards/medals and perceived improvement in their social status in the community.

The sustainability and scalability of the demand activator activity is a challenge because it usually requires external support at numerous stages. MBS implementers may recruit, train, and monitor agents in the initial stages as well as set up the compensation mechanism (whether a fixed amount or share of toilet price) and timing of payment (up front or after installation). In some situations, implementers have taken over active management of agents, including paying commissions. These approaches, while intended to accelerate sanitation coverage, may limit the model's sustainability because most sanitation enterprises are reluctant to manage sales agents and are unlikely to engage them when the implementing organization exits. Furthermore, commissions (including the cost of managing the commission mechanism) and other promotional activities often are not built into product cost, limiting the model's long-term viability. One exception is WaterSHED's intervention in Cambodia, where commissions were in fact built into product costs from the beginning. WaterSHED initially helped entrepreneurs recruit, train, and manage sales agents, and once relationships were established, entrepreneurs and agents interacted directly on their own. Gradually, WaterSHED came to rely on locally elected leaders as sales agents since their presence in every commune and mandate to increase sanitation coverage enhanced the model's long-term sustainability.

Once customers have been persuaded to purchase, a sanitation enterprise needs to deliver the products and services required to construct a toilet. This function of *demand fulfillment* can be carried out via a number of different delivery models, with advantages and drawbacks depending on the context (as well

as implications for product design, sales, and marketing). We discuss the delivery model element of the sanitation enterprise next.

4.1.4 Delivery Model

In WaterAid’s Sustainable Total Sanitation (STS) intervention in Nigeria, the introduction of providers who offered a complete order fulfillment solution for toilets simplified households’ buying process significantly. The solution lowered the overall toilet cost-to-customer significantly from a previous do-it-yourself (DIY) model, in which households had to aggregate the materials required and coordinate with multiple artisans to construct a toilet. This complexity was inconvenient and prone to difficulty in estimating toilet prices. Instead, the model instituted by STS meant that sanitation enterprises (concrete block producers) were fully responsible for aggregating the materials required for constructing and producing the toilet as well as coordinating with multiple artisans for installation.

Different delivery models can reduce the number of transactions and interaction points for customers to increase convenience, enhance supply of quality toilets, and reduce costs (Figure 11). The aggregated products and services include procurement of raw materials, fabrication of one or more toilet components, delivery, installation, and information about (or even provision of) financing options (credit or subsidies). Typically, a “focal point” sanitation enterprise for the customer—the customer-facing business—aggregates products/product components, services, information, or a combination of these, depending upon the delivery model. Different aggregation models are described below.

Figure 11: Toilet delivery models



DIY: In this model, masons provide an onsite, build-to-order service to customers in nearby villages. Masons might procure materials themselves or, more typically, provide the list to customers for DIY procurement. In PHA Benin, masons advised the customer, constructed the slab, and laid the foundation, but households were responsible for arranging pit digging, procuring cement and rebar, collecting sand and gravel, and curing the cement slab.

This model is suitable for markets where pre-casting businesses do not exist, or else, for remote areas with low population density and poor transport connectivity. Entrepreneurs are typically not available or interested in serving such markets, so the DIY model may be the only available option. The DIY model

affords the customer control over the amount they spend on procuring materials and makes toilet provision a possibility where entrepreneurs are less engaged, if at all.

However, limited demand for sanitation and access to inputs, especially in remote, sparsely populated areas, remains the central challenge for masons, who typically cannot activate demand beyond their own operational area (generally a few rural communities in relatively proximity to one another). Another problem is that masons may over-engineer toilets due to their limited experience with sanitation hardware. Lack of capital, especially for molds to cast the slab, is another major constraint. This was the case in Tanzania, where the government loaned *SanPlat* molds to masons on a rotational basis. Some interventions have tried to address these challenges with limited success. For example, in PHA Benin, masons who built a certain number of toilets were eligible for larger school/institutional toilet orders, with the objective of addressing the challenge of low demand. Even so, mason attrition was still high (20 to 40 percent in some areas) (Codja et al. 2009), since masons did not find the rural market attractive enough. Instead, they migrated to peri-urban areas where the market featured: 1) a lack of open space to defecate, 2) wealthier customers, and 3) greater awareness of the health risk of open defecation.

Network: This delivery model involves a loose affiliation of players with any player capable of becoming a focal point enterprise that might sell one or a few components required for a toilet or superstructure while connecting customers to other providers/artisans for procuring the remaining inputs and/or constructing the toilet. In 3Si Bihar, cement ring manufacturers (CRMs) stocked rings and pans, provide linkages to approximately 20 other actors for additional materials and labor services, and offered customers generalized information on requirements for toilet construction.

This model can work where toilet/superstructure components and related services are easily available and where customers are willing to make multiple transactions to procure those materials/services for a price that would be lower than if all materials were sold at one place. Such conditions enabled the network model to succeed in 3Si Bihar, along with the additional donor support provided to activate demand.

A key advantage of the network model is the information provided to the customer about the other supply chain actors in the market. The focal point enterprise also may provide other important information that accelerates the customer's purchase process (as in 3Si Bihar, where some CRMs advised customers about obtaining government subsidies when requested). Providing information in a fragmented market can increase the customer's willingness to purchase toilets, since the time taken to build toilets decreases due to information aggregation. In 3Si Bihar, information aggregation by CRMs contributed to reducing order fulfillment time for a toilet from 70 days in 2013 to 13 days in 2017 (though product innovations played a role as well).

The sustainability of the network delivery model depends on mechanisms such as referral fees or reciprocal business for the focal point, as well as trust. For example, in 3Si Bihar, CRMs did not charge customers extra for providing them with information, but they independently negotiated referral fees with relevant actors (which were not passed on to customers).

One-stop shop (OSS): In this model, the focal point business typically adds value beyond material/information aggregation by fabricating some key toilet substructure and interface components (e.g., concrete pit rings, slab with integrated pan) to provide the customer value through ready-to-install packages (as promoted by the WaterSHED and iDE interventions in Cambodia, as well as WaterAid's program in Nigeria). One-stop shops also may offer services related to the substructure (e.g., delivery, installation of the substructure) and/or materials for the superstructure as optional add-ons. Though, called a "one stop shop", the customer in this model typically still arranges for installation services separately. Providing this service depends not only on the sanitation enterprise's capacity but also on customers' willingness to pay, rather than managing all the material procurement and installation themselves. In the WaterSHED and iDE Cambodia interventions, sanitation enterprises included

materials delivery in the substructure product package price and offered substructure installation as an optional add-on. Customers could also purchase materials for the superstructure since some concrete ring producers also traded in raw materials.

One-stop shop models are best suited for situations where customers are forced to make multiple transactions to procure components and install the toilet, and incur higher transaction costs (in terms of money and/or time) to do so. Additionally, transaction costs can be compounded due to poor transport infrastructure and lack of key input materials.

In addition to making key toilet components available at one place, the one-stop shop model can decrease the cost of value-added products because it is the focal point enterprise that delivers those products. This reduction is driven by increased efficiency in the use of raw materials by the producer, across multiple units, compared to standard quantities of inputs sold individually to customers and used by an untrained/under-skilled third party (such as a mason), which increases opportunities for waste. Since the OSS model requires stocking inventory, high inventory costs and lack of working capital (especially when trade credit is unavailable¹⁴) are potential challenges.

Turnkey solution provider (TSP): The focal point business aggregates the full range of products (including substructure, interface, and superstructure) and services (including delivery and installation) to provide customers with a turnkey solution at a premium. Of the 13 interventions analyzed, the TSP model was tested only in 3Si Bihar, and it did not succeed initially. In an intervention not included in our analysis, iDE's sanitation marketing program in Vietnam, some masons served as the single focal point and managed the entire process for customers—from procurement of materials and pre-fabricated components (from their network of suppliers) to the toilet installation (Jaime Frias and Mukherjee 2005).

TSP may succeed in situations where customers are willing to pay a premium for the convenience of interacting with one focal point business that is responsible for delivery of the entire solution end-to-end, or else where the transaction costs for aggregating inputs are very high due to the remote location of the household. The model requires the focal point business to be skilled in managing the service aspect of providing the solution; possess the facilities and working capital to stock materials and components, delivery vehicles, labor capacity for delivery and installation, and potentially production capacity and labor to manufacture one or more components (e.g., concrete rings).

The TSP model using hardware stores as the focal point enterprise for the customer was initially adopted in the 3Si intervention in Bihar, but customers generally opted to arrange inputs and labor for construction themselves rather than pay the TSP a premium for the convenience. Furthermore, hardware stores, which were experienced in trading products, were unable to successfully manage employment and supervision of masons for installation. However, more recently, some CRMs in Bihar have adopted the TSP model, though the factors supporting the transition from the network model are unclear. On the other hand, iDE's participating masons in Vietnam were able provide this solution since they were a part of a larger network of providers (cement shops, component providers, etc.) that routinely provided material on credit (approximately 60 percent of the direct cost), which enabled the masons to procure materials on behalf on the household (Jamie Frias and Mukherjee 2005).

The key advantage of the TSP model is that it reduces the number of touch points for the customer to one. The main disadvantage is the challenge of high inventory cost for the focal point enterprise, especially if trade credit is unavailable.

¹⁴ Trade credit is an agreement in which a buyer purchases goods on account (without paying cash), paying the supplier at a later date.

The type of delivery model can determine the ideal skills or capabilities that the focal point business should possess or vice versa. In WaterSHED and iDE interventions in Cambodia, the one-stop shop model required the provision of key value-added products, such as concrete rings and lids, a concrete junction box, and a tiled pre-cast slab with ceramic pan. The implementers thus targeted pre-cast concrete production businesses that could leverage their existing capabilities (such as manufacturing capability) and were present in the market to serve as the focal points.

It is important to remember that for the sanitation enterprise to function well, a sufficient pool of customers and entrepreneurs in the market is required. In most sanitation market systems in low-income contexts, an array of significant barriers prevents more customers and entrepreneurs from entering and participating in the market. The next section explores the first set of barriers—those that hinder customer participation in the market—and potential options to address them.

4.2 BARRIERS TO CUSTOMER PARTICIPATION IN SANITATION MARKETS

Market potential for sanitation products and services is limited by barriers to customer participation, which fall into three categories: customers' inability to afford existing products (the "affordability" barrier); a lack of liquidity due to unstable, seasonal cash flows (the "liquidity" barrier); and a lack of active demand despite interest in purchasing a toilet, for reasons that range from competing household needs to low perceived marginal benefits (the "latent demand" barrier). In this section we explore financing mechanisms for addressing these constraints.

4.2.1 Affordability

In Cambodia, the Community Hygiene Output-Based Aid (CHOBA) intervention focused on extending sanitation to the bottom 40 percent of households by providing a partial subsidy (a US \$18 discount for a toilet substructure product package priced at US \$55, excluding installation and the superstructure) to stimulate investment from customers who would otherwise be unwilling or incapable of investing in sanitation. Village chiefs (via a government department) received US \$2 from the implementer for every discounted toilet that customers purchased. Eligible customers paid US \$37 to purchase toilets from a local sanitation enterprise and, after their eligibility was verified by the implementer against the CHOBA database, the subsidy amount of US \$18 per toilet was paid in the form of a supplier rebate to the sanitation enterprise. In a survey of nearly 2000 households between 2013 and 2015, toilet coverage for households that met the government poverty designation (roughly the poorest quintile) increased from a baseline of 23 percent to 53 percent in villages where MBS occurred in tandem with the CHOBA subsidy program, as compared to a baseline figure of 32 percent for MBS-only villages (Rivera et al. 2016b). Critics have pointed to leakage (subsidies being captured by households that do not qualify for them), and the possibility of market distortions (crowding out of private suppliers). Poor subsidy design may indeed discourage household investment in toilets: in theory, subsidies can also crowd out other sources of funding like credit, as households may prefer to wait for a free toilet rather than pay for it on their own (Mehta and Knapp 2004; Evans and Trémolet 2009). At the same time, careful controlled studies have repeatedly demonstrated positive spillover, in which the offer of a subsidy actually increases toilet uptake among those populations ineligible for it (Guiteras et al. 2015; Nicoletti et al. 2017; Rivera et al. 2016a).

Improving the affordability of toilets is key to reaching lower-income households and, thus, increasing market depth. Improved product design can result in lower prices and increase affordability, but toilets can, nonetheless, remain unaffordable for the lowest-income households. Subsidies also can improve affordability and, at least in part, may motivate poorer households to invest in sanitation.

When designing a subsidy program, implementers should consider four interconnected and overlapping elements—form, timing, channel, and amount. We consider targeting as distinct from the four elements of subsidy design due to its relatively higher importance—a subsidy, no matter how well designed, will

be ineffective if targeting is inaccurate resulting in exclusion of intended beneficiaries, inclusion of unintended beneficiaries, or both. Targeting is, therefore, discussed separately from subsidy design.

Form: Subsidies are provided to customers in the form of cash (mainly in emergency response situations); cash rebates, raw material (like cement) or hardware, wherein customers receive a toilet or raw materials to construct one; or discount on the market price. As discussed in ‘Timing’ (below), cash subsidies and discounts are typically linked to an intended outcome—purchase and/or use of toilets. For example, the CHOBA program in Cambodia offered eligible customers an upfront discount on the market price (in parallel with a rebate to suppliers paid upon verified installation), and the same program in Vietnam offered a consumer rebate after installation and verification. Some sanitation implementers in Cambodia have noted that the CHOBA discount incorrectly established price expectations in some markets, which in turn led to dissatisfaction among customers ineligible for the subsidy and also to perceptions of price inflation once the subsidy program ended.¹⁵ Such results could conceivably occur if implementers exclusively communicated the discounted price rather than the actual price and subsidy, though Rivera et al (2016) found that the CHOBA discount combined with traditional, unsubsidized SanMark programs in Cambodia resulted in positive, rather than negative, spillover effects.

Timing: Subsidies can be provided to a customer ex-ante (i.e., in the form of a price discount or a redeemable voucher before purchase of a toilet) or ex-post, wherein customers receive a rebate following verification of both their eligibility and purchase and/or use of toilets. Upfront cash subsidies are almost exclusively used in the context of disaster relief and are typically limited to raw material/hardware. During emergency response, recovery, and reconstruction, an upfront well-targeted hardware subsidy may be suitable for targeting particularly vulnerable populations. For example, in the Pintakasi typhoon recovery intervention in the Philippines, interveners targeted in-kind subsidies at female-headed households, people with disabilities, the elderly, or families with very young children (Ahmed and Hrybyk 2016a). Other households opted for ex-post conditional cash transfers since they were likely able to arrange a product of their choice from a sanitation enterprise or input supplier.

While a discount is also an upfront subsidy from a customer’s perspective, the discount is realized only if the customer purchases a toilet and is therefore considered effective. Ex-post subsidies (e.g., rebate) are meant to ensure actual toilet purchase and construction, since they are disbursed to the customer upon verification of the installed toilet. Rebates can often take time to process and customers may thus require bridge financing¹⁶ as illustrated in Bihar (Box 4 in Section 4.2.2) and CHOBA in Vietnam (East Meets West Foundation 2016) though in Vietnam several tens of thousands of households took advantage of the rebate without the help of loans. Customer response to ex-post subsidies also may be muted by lack of trust in the subsidy program or perceived risk of not receiving rebates, even after investing out of pocket.

Output-based subsidies can assume multiple modalities. They can be paid to households upon verification of a purchased and properly installed toilet; they can be paid to suppliers as the reimbursement for delivering toilets to customers at a discount; or they can be paid to communities upon the achievement of a collective outcome (such as the increase of household ownership by some pre-determined amount, which is motivated by the public health imperative to achieve herd protection). Given the OBA’s limited application to date, its sustainability potential is uncertain (as is the case for any

¹⁵ FSG Primary Interviews.

¹⁶ Bridge financing is defined as an interim financing option that allows the borrower short-term access to funds until a long-term option can be arranged. In the case of results-based finance (RBF), bridge financing can provide the borrower with funds to invest in the outputs that trigger RBF payments. The RBF payments can then help repay the bridge finance loan.

subsidy approach), the scale of achievement of the CHOBA program in both Cambodia and Vietnam notwithstanding.

Channel: Subsidies can be channeled either to the customer or to the entrepreneur. Subsidies channeled to entrepreneurs rather than customers are easier to manage due to the lower number of recipients involved. However, doing so exposes sanitation enterprises to the risk of non-payment in cases of leakage or ineligible claims. For example, in CHOBA Cambodia, customers received a discount and the subsidy was paid to sanitation enterprises as a rebate only after verification of delivery and the customer's eligibility. In cases where independent verification deemed a purchase ineligible, sanitation enterprises did not receive the subsidy and incurred a loss of approximately US \$18 per toilet. Vouchers may overcome this shortcoming with guaranteed payment to sanitation enterprises. Since vouchers are issued to households identified by implementers of subsidy programs, the risk of ineligible or unintended recipients falls on the subsidy program. Vouchers however, entail high set-up costs and overhead to manage and administer systems and have not yet been used significantly in sanitation programs.

Amount: The level of subsidy can be set as a fixed amount or as a percentage of the total hardware costs, or it can be weighted across customer segments, with a higher subsidy going to those with the greatest need. Fixed-amount subsidies are easier to administer and may be more effective than weighted subsidies or percentage-based subsidies since it encourages toilet suppliers to keep costs down. With fixed amount subsidies, however, failure to adjust for inflation or differences in geographic contexts can increase the amount households have to invest, as seen in the Total Sanitation Campaign in Maharashtra, India (Trémolet et al. 2010a).

Our research did not reveal conclusive evidence on the optimal ratio of subsidy to total hardware price, as subsidies have ranged from 20 to 75 percent and have been given to from 7 to 100 percent of the population in target areas (Trémolet et al. 2010a). For example, in Bihar, a *Swachh Bharat* subsidy of approximately US \$200 was available to customers on a product priced between US \$250 and \$300, yet in CHOBA Cambodia, customers could receive a subsidy of US \$18 for a toilet material package priced at US \$55, excluding cost of installation and superstructure.

Additional research is needed to determine the form, timing (ex-ante or ex-post) and level of subsidies that can increase coverage without creating market distortions. Subsidies could be tailored to population segments/groups for higher uptake and efficiency as demonstrated by the Pintakasi experience in Philippines. There, households, when offered a choice, opted for different forms of subsidy, depending on their individual situations and preferences (Ahmed and Hrybyk 2016b).

In addition to good design, subsidies also must be well-targeted to effectively address the affordability barrier and increase coverage of MBS interventions to include lower-income households. Untargeted subsidies result in unintended beneficiaries among relatively wealthier customers, who could afford to pay on their own, at the expense of the poorest of the poor. Conversely, well-targeted subsidies help ensure efficient use of government and donor funds. For example, some CRMs in Bihar provided information on government subsidies to households that could qualify (i.e., first-time buyers, households below the poverty line, and households above the poverty line in categories such as women-headed families, scheduled castes, and scheduled tribes) to motivate them to purchase toilets.

Numerous subsidy targeting methods exist, and their applicability varies by context. A six-country comparative review of financing onsite sanitation for the poor provided examples of targeting methods that have worked in some contexts (Trémolet et al. 2010a). It also found that community-based targeting and self-selection appear to be more effective than means-tested systems.

- **Means-tested targeting** is expensive, and its effectiveness depends on the quality of the poverty system or data used. For example, in Maharashtra, India, use of outdated survey data resulted in substantial errors of inclusion (from 5 to 10 percent) and exclusion (from 10 to 20 percent). In

Cambodia, CHOPA benefited from the availability of an updated nation-wide poverty identification system (ID Poor) that facilitated poverty targeting across regions. Leakage was minimized because the system is updated every two to three years. In addition, the implementing organization, East Meets West, made sure that gaming placed communes at the risk of being disqualified. As a result, subsidy payments were withheld from sanitation enterprises and incentives were withheld from village chiefs and other promoters if more than 10 percent of claims were found ineligible (East Meets West Foundation 2016).

- **Community-based testing** is a more flexible and less expensive method of targeting than means-tested targeting. The method partially contributed to significant improvements in targeting in the DISHARI (Decentralized Integrated Sanitation, Hygiene, and Reform Initiative) intervention in Bangladesh. There, communities received a financial award after achieving ODF status, which encouraged community members to identify and enable the poorest households to access the subsidy.
- **Geographic targeting** costs less than means-tested targeting because it is used for whole regions where the majority of households are poor. For example, in Ecuador, subsidies targeted at poor rural areas and small towns (populations less than 10,000) were available to anyone living in the eligible area. They both reached their intended recipients and benefited non-poor households.
- **Self-selection**, conceptually, is the least expensive method and the easiest to administer because it assumes that only the poor would self-select for the most basic form of sanitation. However, there is no evidence of the method's efficacy.

The combination of geographic or means-tested targeting (e.g., using eligibility/exclusion criteria such as household income) and community-led targeting was found to be effective in improving targeting in the DISHARI intervention in Bangladesh, PAQPUD (Programme d'Assainissement Autonome des Quartiers Peri-Urbains de Dakar) intervention in Senegal, and the Three Cities Sanitation Program in Vietnam. In Bangladesh, means-tested targeting alone (independently of the DISHARI intervention) resulted in leakage of between 20 and 50 percent, but when used in combination with community involvement, targeting improved significantly (Trémolet et al. 2010a).

This sub-section has highlighted how subsidies, when well-designed and implemented, can help address customers' affordability barrier to participation in the market by reducing the net amount that they pay for a toilet. Other customers struggle to make the net lump-sum payment often required for a toilet due to uneven cash reserves over the course of the year. This "liquidity" barrier is distinct from the affordability barrier and may be overcome by a different financial mechanism—credit—as we discuss below.

4.2.2 Liquidity

Due to the agricultural (and cash flow) cycle in rural Bihar, 80 percent of the customers did not have sufficient funds (US \$250–\$300) available upfront to buy a toilet (S. Narayanan 2015). At the same time, credit providers (mainly MFIs, since microfinance is a well-developed market in India) were not willing to extend loans for sanitation because they considered consumption loans risky when compared to income-generating loans. To relieve the customers' liquidity constraints, the 3Si intervention incentivized MFIs to offer sanitation loans by setting up a revolving fund and underwriting part of the default risk. As of 2017, six MFIs had extended approximately 32,000 loans for sanitation with a nearly 100 percent repayment rate. Due to the revolving fund design, an initial injection of US \$1.2 million extended loans worth approximately US \$8.1 million to consumers.

There are many reasons customers may be unable to make upfront payments for sanitation, such as lack of savings or seasonally fluctuating or otherwise unstable or unpredictable income flows. Credit, either through a sanitation loan or through a sanitation enterprise, allows customers to spread out the cost of

the toilet by aligning payments to their income cycles. Credit also can help households take advantage of rebate/ex-post subsidies by serving as bridge financing until they receive the subsidy. The role of credit as bridge finance was seen in the 3Si intervention in Bihar (Box 4).

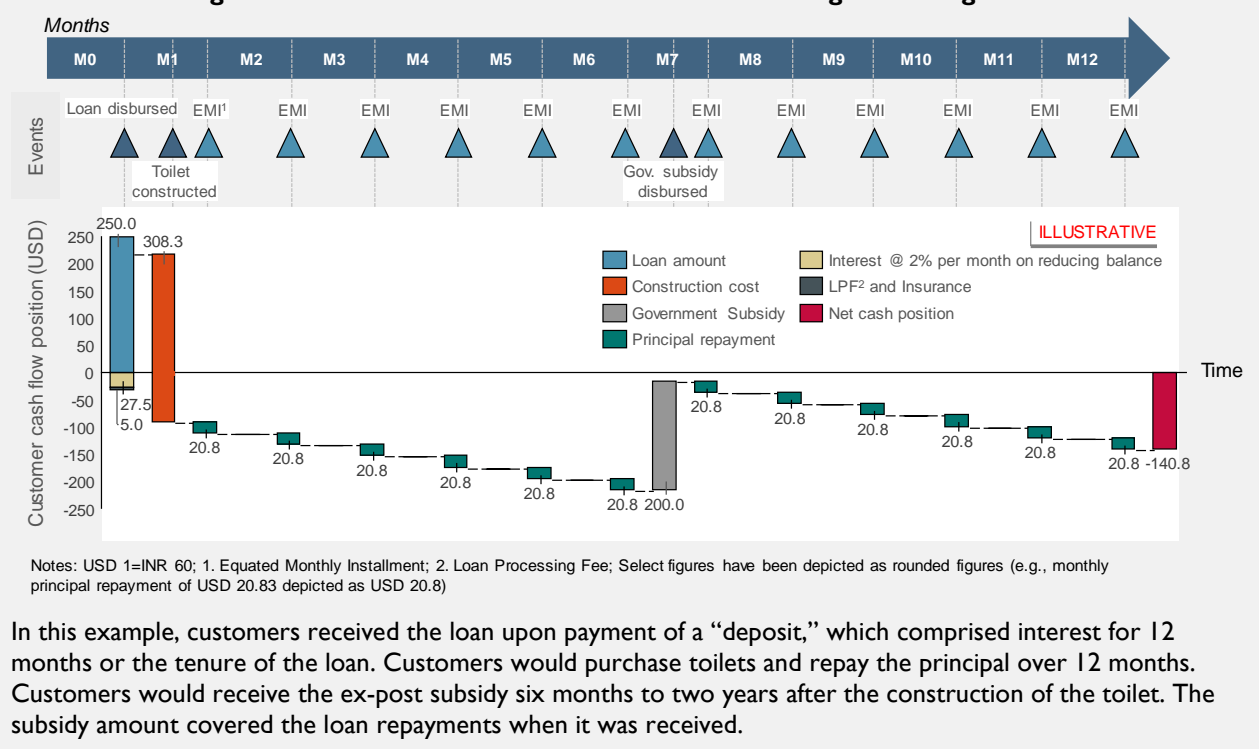
Neither the literature nor our case studies provided insights regarding which of the following potential lending channels customers preferred.

- **Commercial banks** may have capital available for sanitation loans and would extend credit to middle income borrowers. However, banks may be uninterested in sanitation loans because of the smaller loan amount sizes, perceived higher risk of default, and/or lack of branch networks in the target areas. In Peru, a commercial bank (in addition to MFIs and government financial institutions) considered providing a loan product since the target customers were willing to contribute approximately US \$44 per month toward sanitation compared to US \$688 cost of a toilet. The bank, however, charged a high interest rate and ultimately did not participate in the *Mi Baño* association (Fuentes et al. 2008).

Box 4: Use of credit and subsidy in tandem in 3Si Bihar

In Bihar, the government offers a “Swachh Bharat” ex-post subsidy of US \$200 for toilets that are typically priced between US \$250 and \$300, including superstructure. While the subsidy provision may have motivated customers to purchase a toilet, they still lacked the upfront capital and thus could not take advantage of the subsidy. The 3Si intervention—which did not actively take advantage of the subsidy amount—made upfront credit available to the customers, which served as bridge financing for some customers (Figure 12).

Figure 12: An illustration of the use of credit as bridge financing in Bihar



- **Existing MFIs** are more suitable for providing sanitation loans to lower-income households because they employ credit assessment and management systems, as well as processes for disbursement and collection of smaller amounts compared to banks. When microfinance is structured as a revolving fund, the leverage can be high. MFIs can be encouraged to enter into sanitation financing, but, like commercial banks, MFIs also view sanitation as risky since it does not generate income.

Additionally, the administrative costs for a sanitation loan are higher (as a percentage of the loan amount) than those of a typical higher-value, income-generation loan, reducing the MFI's operating margins. MFIs typically do not reach the poorest, although their reach can be improved by making use of community savings and loan groups.

- **Savings and loan groups** can take greater risks and serve more remote areas due to their close relationship with communities and local entrepreneurs. They also can ensure high repayment due to social pressure. These informal saving and loan groups may offer higher flexibility as well. Such mechanisms can be used where social norms encourage group lending, but these saving and loan groups may have insufficient lending capital, poor or non-existent management information systems (MIS) for tracking loans, and/or limited capacity to develop new loan products (since personnel are largely voluntary). In Ghana, Village Savings and Loan Associations (VSLAs) were used in the absence of any formal mechanism, but borrowers' tendency to use loaned funds for purchases other than their stated purpose (sanitation) remained a challenge.
- **Non-governmental organizations (NGOs)** have low profit motives and thus may offer loans to customers at lower interest rates and lend to poorer customers. NGOs may be appropriate lenders when limited scale is required (low population) or the poorest customers need to be served. However, NGOs often have limited credit assessment systems as well as weak banking capabilities, which can lead to operational issues during scale up. Further, this channel is unsustainable in the long term. The direct involvement of the NGO channel creates an additional challenge of market distortion: customers may prove reluctant to repay loans to a lender whom they perceive as a purely charitable resource. For example, in Malawi, Water for People (W4P) provided a local MFI with a US \$20,000 default guarantee as an incentive to provide sanitation loans. Customers became aware of the guarantee and felt they should not have to repay loans that were given for free to the MFI, which led to higher default rates.
- **Government institutions** may be appropriate lenders when government policies advocate and support sanitation/financial inclusion. However, government institutions may disburse credit based on political motivations rather than objective creditworthiness criteria, and they typically involve long, rigid processes and approval systems that make access to such loans difficult. When done carefully, government lending programs with lower interest rates can be very powerful tools for increasing toilet adoption.
- **Credit from sanitation enterprises to households** (or payment in installments) can be beneficial, since an additional or third-party actor would not be involved in toilet purchase transactions. Such loans may be appropriate when customers are known and trusted, for credit to be extended without collateral. Their effect on sanitation enterprises' viability, however, is unknown, and entrepreneurs may be reluctant to provide installments due to the risk of non-payment and the burden of tracking and collection. In Cambodia, a study found that 7 percent of adopters in the "Hands-off" intervention paid the sanitation enterprise in installments. At the same time, entrepreneurs were reluctant to offer financing or installment payment options because tracking and collecting payments were not their core competency, and many entrepreneurs considered customer default to pose an unacceptable risk (Pedi et al. 2014).

This review of credit providers reveals three central challenges to providing upfront capital for sanitation.

- The risk of default, which makes sanitation loans unattractive to potential lenders;
- the difficulty of ensuring that sanitation loans are used as intended; and
- the reluctance of certain institutions to enter the sanitation sector for various reasons.

One approach to tackling default risk has been to provide group loans. Group lending mechanisms can enhance customers' capacity to pay while also imposing social pressure on borrowers to repay. For example, in rural Ghana, the "Results Based Financing for Sanitation and Hygiene" project facilitated the creation of local and informal VSLAs. Members contributed savings weekly to the VSLA, and after three months, they became eligible to borrow a loan valued at three times their savings. Since the members' savings were often not sufficient, the World Bank provided matching funds to ensure adequate capital. A total of 248 VSLAs were established over four years (World Bank 2014). Social pressure and mandatory savings meant that nearly 100 percent of loans were repaid.

In the above case, however, customers' decisions not to use the loans for sanitation created a key challenge. In some cases, channeling the loan through sanitation enterprises has overcome this problem. In Bihar, some loans were provided through the Turnkey Solution Provider (TSP), a sanitation enterprise that provided all components and services required to construct a toilet.¹⁷ Under this model, the MFI would give funds to the TSP, which then provided the toilet to the customer, initiating loan repayment. Similar arrangements were informally established in parts of Cambodia between some astute entrepreneurs and MFI agents who would attend group sales meetings together. This model also was used successfully for a revolving fund of bank toilet loans in urban Lesotho.

To overcome institutions' reluctance to enter the sanitation sector, external support and grant funding has sometimes been required to encourage lenders. Subsidies in the form of risk guarantees, capital at below-market interest rates, and grants toward operational costs often are required to assuage credit providers who worry about risks and high costs associated with servicing non-income generating loans. For example, in the 3Si intervention, MFIs that were reluctant to enter sanitation financing due to perceived higher credit risk received risk guarantees and/or lower borrowing costs. Other MFIs followed where they saw a successful demonstration of sanitation loan products. In both IUWASH in Indonesia and 3Si in Bihar, initial grants were required to convince players to disburse sanitation loans. In iDE's intervention in Cambodia and 3Si, loan guarantees were given to MFIs to lower their risk assessment of sanitation loans, though we cannot comment on the impact of guarantees on actual lending.

In contrast, while WaterSHED partnered with a MFI (VisionFund) to introduce sanitation loans in its intervention areas in Cambodia, it did not provide the MFI loan guarantees or any other form of subsidy. Instead, it convinced VisionFund to transfer the loan amount directly to the sanitation enterprise and charge the sanitation enterprise an "origination" fee. This fee, approximately 2 percent of the toilet purchase cost, helped VisionFund offset its cost of operations and the perceived risk of providing non-productive loans without the need for loan guarantees. In an effort to promote sustainability, WaterSHED demonstrated a market opportunity to VisionFund while restricting its own role to facilitating the relationships between sanitation enterprises and the MFI (Emerging Markets Consulting 2014). Currently, VisionFund has 9,838 clients with a total loan portfolio of US \$655,310 (Visionfund Cambodia n.d.).

But even with the availability of subsidies to address the affordability barrier and credit to deal with the liquidity barrier, a third barrier to customer participation can hinder market depth: latent demand. This is discussed below.

¹⁷ The 3Si program has ~750 cement ring manufacturers as the key entrepreneurs; however, three to four Turnkey Solution Providers also exist.

4.2.3 Latent Demand

A demand assessment study conducted by WSP in Cambodia in 2007 found strong interest in acquiring toilets; 77 percent of households expressed interest in constructing a toilet. However, millions had yet to act on this latent demand. While affordability was a key barrier to purchase, it was not the only one. Some poor households (though not the poorest) had purchased a toilet on their own, while many better-off households had not done so. Many customers deferred their purchase because they wanted to save up for expensive, high-end toilets. In addition, many wished to avoid “low-end” products, gave a low priority to sanitation, recoiled at the complexity of the purchase process, and distrusted the price and quality of the products and services offered. As a result, 80 percent of rural households lacked access to improved sanitation, including many households in the top wealth quintiles (Roberts et al. 2007a).

The above scenario highlights the importance of latent demand or customers who can afford toilets and have a “willingness to buy,” but do not make a purchase for a range of reasons. Willingness to buy cannot be regarded as a binary choice (Devine 2009); consumers undergo a three-stage process to adopt sanitation solutions: forming a preference, developing intent, and finally, making a choice. Each stage increases their willingness to buy (Jenkins and Scott 2007).

In markets where customers have not yet *formed a preference* to alter their sanitation behavior, raising awareness to generate demand is more important than MBS approaches. Convincing households to stop open defecation requires different strategies than convincing households to seek improved sanitation (Sy and Warner 2014). For example, in Benin, the slow uptake of toilets and lack of community pressure on households to stop open defecation led to the discontinuation of an MBS approach and a shift in focus to demand generation approaches such as CLTS (Codja et al. 2009).

The first stage in adoption (i.e., buying a toilet), therefore, begins with forming preferences for sanitation. Even if households want to change their hygiene and sanitation behaviors and have thought about a toilet, they may not have actively pursued information or advanced their decision making. For example, WaterSHED’s survey of rural consumers in two provinces of their intervention area in Cambodia determined that 92 percent of respondents (residing in households without toilets) had thought about purchasing one but nearly half had not even discussed it with their families (Pedi et al. 2014). The next stage in the process for a household is to demonstrate intent by seeking information on potential solutions.

Households that *develop the intent* to purchase a toilet take specific actions, such as saving money and identifying product and supplier options. A market assessment carried out in Bihar identified such key barriers to making a purchase decision as: competing financial priorities, limited access to sanitation enterprises due to distance from markets, and low interest in toilets without septic-tanks for some customer segments (Monitor Deloitte 2012). The low spending priority assigned to sanitation is a particularly significant barrier to translating intent into a decision to purchase, even among households that can afford toilets. Households that can pay for toilets may be receptive to demand activation mechanisms such as those adopted by WaterSHED and iDE in Cambodia, where sales agents specifically addressed customers’ most common barriers to decision making.

Households who have *made a choice* to install a toilet and have saved money and/or obtained a loan are most likely to purchase. These customers still require a connection with a service provider who can deliver the desired product at a viable price. For instance, 3Si Bihar found that select socio-economic segments exhibited an ability to pay for toilets and a relatively high desire to purchase, even though they had low awareness of available options in the market. Such customers were targeted by demand activators (referred to as toilet motivators by 3Si) who connected them with local sanitation enterprises.

Successfully addressing barriers that impede customer participation in the sanitation market can increase the customer side of market depth, but the entrepreneur side requires attention as well. The next section explores the barriers to entrepreneur participation in the sanitation market and strategies to address them.

4.3 BARRIERS TO ENTREPRENEUR PARTICIPATION IN SANITATION MARKETS

Three significant barriers impede entrepreneurs from investing in the sanitation market: factors that affect the viability of sanitation enterprises (“viability” barriers); lack of access to enterprise capital, which hampers entrepreneurs’ ability to start and grow sanitation enterprises (“capital” barriers); and lack of qualified commercial actors (“availability” barriers).

4.3.1 Viability of sanitation enterprise

Among the many factors that can impact the viability of sanitation enterprises, low turnover and unit profitability¹⁸—in margin or absolute terms—are often the major challenges that face rural sanitation enterprises. Indeed, in Cambodia, like many other markets, a standalone sanitation enterprise often is not viable because it is a seasonal business and customers only have disposable income during certain times of the year (e.g., harvest season) (Wei et al. 2014). Viability of sanitation enterprises often has been enhanced by expanding coverage to nearby villages, thereby targeting new customers. For this approach to work, the product system must be easy to transport, and new villages should be serviceable by existing road infrastructure. In markets with higher price elasticity, sanitation enterprises have been able to increase market penetration by lowering prices, achieved through reduction in product costs and lower margins. While product innovations can lower costs, lowering margins can have a significant impact on price since sanitation enterprises often tend to seek high gross margins to compensate for low volumes. WaterSHED program reports that sanitation enterprises were convinced to adopt a low margin, high volume strategy that resulted in lower prices, higher volumes, and increased net profit.

Even if a sanitation enterprise achieves unit profitability, business profitability¹⁹ may be affected by a failure to consider all costs, which either results in failure to become profitable or reduced attractiveness relative to other non-sanitation businesses in an entrepreneur’s portfolio. For example, 58 percent of sanitation enterprises supported by iDE in Cambodia have exited the market even though a majority of them broke even. Some were active (produced toilets) only during the peak season due to the high seasonality of sales, and entrepreneurs who found opportunities for year-round income elsewhere left the sanitation sector. Exceptions exist where sanitation enterprises, even those with low unit or business profitability, are seen as sources of supplementary income or provide entrepreneurs with avenues to grow other businesses in their portfolio. A sanitation enterprise, in other words, may create an opportunity for sales of other products and services. These include the superstructure for the toilet, an additional concrete pit, hardware components (e.g., pipes, tiles), or raw materials (e.g., cement, gravel) for home improvement. WaterSHED’s analysis of rural customers in Cambodia found that 50 percent of customers who purchased and installed a toilet from a sanitation enterprise supported by the program had bought or considered buying other materials (for the interface or superstructure) or services from the same entrepreneur (Pedi et al. 2014).

Positive, albeit temporary, externalities also may artificially bolster the business profitability of sanitation enterprises. These externalities may take the form of subsidies to sanitation enterprises or donor-

¹⁸ Unit profitability refers to the gross margin or gross profit per toilet after taking into account material, labor, transportation, and (ideally) sales commission costs; however, it generally does not include the overheads—managerial capacity, capital cost, etc.

¹⁹ Business profitability refers to the net profit margin after accounting for overheads and other indirect costs.

funded public goods (see section 4.4 for a more detailed discussion on these) that are not part of the sanitation enterprises' cost structure. For instance, in the 3Si program in Bihar, sanitation enterprises did not bear the cost of sales commissions, training, and management of sales agents. The STS program in Nigeria provided sanitation enterprises with highly-subsidized molds. The longer-term sustainability of sanitation enterprises will be at risk when such externalities cease to exist. Some of the sanitation enterprises connected to iDE in Cambodia that withdrew from the market were initially engaged via subsidy programs that guaranteed sales at a fixed price; once these programs ended, the enterprises found it difficult to sustain operation (Wei et al. 2014).

Unit level unprofitability will deter entrepreneurs from entering the sanitation market, while low business profitability will reduce the viability of sanitation enterprises and potentially render them inactive. The viability of the sanitation enterprise—at unit, business, and overall level (i.e., after accounting for recurring costs of positive externalities borne by interveners)—is therefore important to ensure robust and sustainable supply in the market. The thresholds of profitability and the share of overall revenue that encourage entrepreneurs to enter the market and continue operating sanitation enterprises are not well understood. Indeed, we do not fully understand how entrepreneurs are even attempting to measure viability (through tracking key metrics like unit profitability or return on investment, for example).

4.3.2 Access to capital for sanitation enterprise

Access to capital in the form of equity or debt drives the purchase of the equipment and materials required to supply toilets. While capital can help sanitation enterprises grow and reach more customers, these enterprises are often small and informal; they tend to lack the collateral typically required for formal business loans. As a result, funds to finance sanitation enterprises are typically sourced from the informal sector. A project analysis of sanitation enterprises affiliated with iDE Cambodia illustrates the importance of capital. It concluded that top performing sanitation enterprises (those in the upper two quintiles) were more likely to have borrowed from multiple sources (banks, MFIs, and informal sources) to purchase equipment and materials than those in the lower performing quintiles. In all, during the intervention period, more than a third of the sanitation enterprises associated with iDE Cambodia's program took out business loans, worth a cumulative US \$600,957. Of this total value, 40 percent was provided by banks, 37 percent by MFIs, and 23 percent by informal lenders (Wei et al. 2014). Difficulty with accessing business credit is of course not unique to small, informal startup sanitation enterprises.

Capital for sanitation enterprises is a relatively new area in the financial services industry, and while there are instances in which entrepreneurs have accessed capital from diverse sources, little evidence exists about sustainable or scalable delivery mechanisms for enterprise finance. Some examples of sources and mechanisms of enterprise finance are provided below.

- **MFIs provided loans to sanitation enterprises as part of their portfolio of income generation loans.** In Cambodia, some sanitation enterprises that were part of an entrepreneur's portfolio got loans from MFIs based on the overall business rather than the sanitation operations alone. In Bihar, however, sanitation enterprises received loans from MFIs partially due to their association with the 3Si intervention— minimum of five to six months association with the 3Si intervention, and a recommendation from PSI, the project implementer— and their credit assessment.
- **Sanitation enterprises also have received credit from upstream suppliers such as distributors and retailers of materials.** For example, in Nigeria and Cambodia, entrepreneurs secured trade credit for sanitation enterprises that were part of the portfolios of entrepreneurs who had existing trade credit arrangements with suppliers for their other business lines.

Impact investors have started providing enterprise finance via loans and equity to small and medium sized businesses in developing countries in Africa, Asia, and Latin America. These investors are generally more flexible than traditional financiers, as they can work more closely with the companies they support to help boost their chances of success. The sanitation enterprises targeted by impact investors are generally too big for microfinance but too small or risky for commercial credit. Their capital needs of tend to fall in the range of US \$10,000 to \$250,000, depending on the country (Kwolek 2012). For example, a consortium of investors including Acumen, SpringHill Equity Partners, and Eleos provided growth capital to Sanergy²⁰ for expanding its “Fresh Life” toilet-franchise model (Sanergy n.d.). There were no examples of such investments, or explanations for how they might be facilitated, among the interventions we selected for case study research.

Subsidies to sanitation enterprises in the form of discounted or guaranteed loans can help facilitate access to credit. In the case of a loan guarantee, a guarantor (usually a donor or other external intervener) makes a promise to a lender (such as an MFI) to assume all or part of the debt obligation if the sanitation enterprise defaults on the loan. This reduces the default risk lenders face and makes them more likely to lend. With subsidized loans, a donor or other external intervener provides capital to a lender (such as a MFI) at a below-market interest rate, allowing the MFI to lend to sanitation enterprises at a lower than normal interest rate. In 3Si Bihar, Friends of Women’s World Banking (FWWB) received US \$1.2 million for on-lending to MFIs at below-market rates (6 to 10 percent per annum compared to a market rate of 12 percent). The purpose of this soft loan was to promote both customer and sanitation enterprise financing; following its issuance, 251 loans were extended to sanitation enterprises as of 2017 (PSI India 2017).

Both viability challenges and lack of capital access can limit the entrepreneurial participation in sanitation; the depth of the market may also be limited by a lack of entrepreneurs with the requisite skills and assets to manage sanitation enterprises. Below we examine the challenge of “availability” of entrepreneurs in the sanitation market and explore MBS interventions that might have addressed the challenge.

4.3.3 Availability of entrepreneurs

In Tanzania, 470 local masons were trained in the production and marketing of SanPlats and basic business skills under the Total Sanitation and Sanitation Marketing (TSSM) intervention, but only an estimated 25 percent were active after one year. Though there were an array of reasons for this attrition, one undeniable challenge was that many masons did not possess the skills and/or mindset to succeed as entrepreneurs and took a passive attitude to marketing their services—a tendency that training could not overcome. The program’s five-day training session paid an allowance that exceeded their annual income, so initial participation was high, but ultimately, an evaluation determined that only 4 percent had the requisite mix of sales skills, technical ability, business acumen, and dynamism to develop successful businesses (and those who were successful were indeed already entrepreneurs prior to the intervention) (Robinson 2011).

A number of factors limit the pool of potential entrepreneurs. Lack of a sufficient pool of qualified entrepreneurs to supply toilets is a common challenge in many rural sanitation markets. The case of masons is instructive here: masons have traditionally assumed the role of sanitation suppliers due to their role of constructing toilets, often play a key role in providing sanitation information to customers in rural markets, advise customers about product options, and help them navigate the complex purchasing process. For example, in Nigeria, households relied on masons for design advice, material recommendations, and construction (even though they tended to overbuild slabs, since they benefited

²⁰ Sanergy is a sanitation company that provides low-cost toilet units and waste management services under a franchise model throughout urban slums in East Africa (<http://saner.gy/>)

from larger and more costly jobs) (Emisen et al. 2014). Though they play a role in sanitation provision in many rural markets, masons frequently face challenges developing the necessary capabilities, assets, and attributes to successfully run a sanitation enterprise.

The MBS literature points to four essential skillsets that entrepreneurs require to develop a successful sanitation enterprise:

- **production:** capabilities in product development, manufacturing, procurement, inventory management, and quality control, as well as a keen awareness of the product options available in the market;
- **management:** bookkeeping, stock management, costing, price setting, and the ability to liaise with external organizations, such as financial institutions;
- **demand activation:** promotion and marketing capabilities; and
- **customer care:** post-sale services.

It is also important that entrepreneurs possess physical assets such as a production facility and the tools such as molds required for sanitation enterprises.

Indeed, entrepreneurs are also typically required to possess capital, an appetite or tolerance for risk, the commitment to run and grow their business, and various entrepreneurial skills (e.g., sales, business acumen, and technical knowledge). Yet mason training often is found to be “largely ineffective in introducing sales and marketing techniques or business development skills” among the participants (Rosensweig et al. 2012).

The capabilities and attributes required to run an enterprise are not unique to the sanitation sector. In some markets, implementers have engaged entrepreneurs with existing businesses (not necessarily from the sanitation sector) who possess the necessary attributes, capabilities, and assets. In Cambodia, iDE and WaterSHED each recruited entrepreneurs from a pool of existing pre-cast concrete product manufacturers to expand the availability of entrepreneurs. In the select MBS interventions we studied, entrepreneurs who entered the sanitation market often were engaged in complementary or related business lines that shared inputs (e.g., cement, gravel, sand), production skills (e.g., casting concrete products, metal fabrication), and customer base, though in Peru, the lower-income customer segment was largely new for *Mi Baño* association members. Unsurprisingly, entrepreneurs from complementary or related sectors often compare the attractiveness or benefits of investing in and managing sanitation enterprises with other commercial opportunities. Alternative businesses with the potential of yielding higher revenues, achieving better margins, or requiring fewer inputs can compete for entrepreneurs’ resources. iDE’s assessment of the enterprises it supported in Cambodia revealed that the top performing sanitation enterprises were not necessarily managed by entrepreneurs with the most resources (e.g., capital, delivery trucks); they sold other concrete products and often had institutional sales that delivered higher margins than their sanitation enterprise. By contrast, some of the entrepreneurs with relatively lesser resources often had the highest toilet sales in part because they either had fewer alternative lines of business or were engaged in alternative businesses less profitable than a sanitation enterprise (Wei et al. 2014).

While engaging entrepreneurs from complementary or related sectors can help address the availability barrier, there may be challenges faced by new entrepreneurs without prior involvement in sanitation. Positioning new entrepreneurs as focal point enterprises has led to difficulties in some instances, particularly in customer acceptance. Customers’ lack of trust and familiarity with a fledgling enterprise can affect their decision to purchase. For example, in Bihar, customers were accustomed to buying toilet components from cement ring manufacturers (CRMs), but were not familiar with new outlets that stocked all components required to construct a toilet (in the form of turnkey solution providers). As a

result, the 3Si intervention eventually opted to rely on existing entrepreneurs and their existing outlets (CRMs) instead of creating new (turnkey service providers, or TSPs).

The chosen delivery model can entail an onsite service component, specifically in situations where the product is not pre-fabricated. Businesses that originated as product manufacturers or traders may find this aspect of the business challenging, given their experience operating from a fixed point with short-term transactional relationships rather than delivering to a home over an extended period. This discomfort was apparent in the case of hardware store-turned TSPs in Bihar (see 4.1.4 for details on the TSP model). Hardware stores had experience in trading products but not in managing end-to-end services and the labor involved. Furthermore, masons who were hired on a monthly basis preferred to work as day laborers rather than as employees on monthly payroll.

Our survey of the literature and in-depth intervention case studies revealed that the range of entrepreneurs who have run sanitation enterprises vary by size, core business (e.g., concrete block production, hardware stores), and assets/capabilities. Regressive and sexist gender norms have limited women's opportunities to become entrepreneurs; in many countries, women face significant barriers to entering the sanitation sector due to cultural admonitions against working outside the home or travelling away from their villages.

Further research is warranted to better understand the drivers of performance among diverse entrepreneurs in the market and to identify the archetypes of entrepreneurs who are best suited to different types of product systems and delivery models. We have explored the three core elements of the sanitation market: the sanitation enterprise, customers, and entrepreneurs. Understanding the mechanism of exchange of products and services and its constituent parts, as well as the barriers that hinder market depth on the customer and entrepreneur sides, is crucial for pinpointing the specific challenges in a given market and thus determining where and how to intervene. At the same time, certain barriers beyond the sanitation market also affect the scale of MBS. In the next two sections, we explore two broader elements that are part of the sanitation market system—business environment and context.

4.4 BUSINESS ENVIRONMENT

The business environment is comprised of factors with a direct or indirect effect on scaling sanitation enterprises (or the market itself). Barriers to scale exist at various levels beyond the sanitation market, and sanitation enterprises themselves are not well positioned to address these barriers. We explore four key components of the business environment that impact sanitation markets: capital, associated supply chains, public goods, and market rules.

Capital, primarily for the provision of credit to customers and entrepreneurs, can help increase the depth of sanitation markets. MFIs, which conventionally focus on loans for income-generation activities, may restrict or limit the provision of consumption loans (e.g., for the purchase of consumer goods including toilets) due to industry regulations or internal risk management policies. Overcoming this barrier may require donors or other external interveners to provide MFIs with grants or credit default guarantees to demonstrate the market opportunity for sanitation loan products. Grants also may be used to establish revolving funds to overcome the ceiling on consumption loans as share of the total loan portfolio.

Associated supply chains involve the supply of products and services that support the functioning of a sanitation market. They primarily include raw materials (such as cement, pipes and fittings, and rebar) and capital equipment (such as molds for casting toilet components). Construction materials have a significant effect on entrepreneur viability and the price of toilets, since they can account for 60 to 80 percent of total production costs of toilets (Sy and Warner 2014). The highly penetrated state of supply chains for materials in Cambodia and Bihar ensure wide availability of most raw materials at reasonable

prices, enabling sanitation entrepreneurs to sell lower-cost toilets profitably. Some MBS interventions have overcome barriers in construction material supply chains by redesigning products to reduce or eliminate the need for scarce materials, or else by bringing upstream providers closer to sanitation entrepreneurs. In Mozambique, the *SanPlat* was designed to eliminate the need to use imported rebar, which was expensive and scarce. In Bihar, 3Si overcame the lack of available PVC doors for the superstructure by persuading an in-state entrepreneur to procure and stock PVC doors in exchange for guaranteed purchases by local sanitation enterprises.

Lack of equipment (e.g., molds) hinders sanitation entrepreneurs' ability to construct toilets. Addressing the shortage has involved providing equipment to entrepreneurs or encouraging them to set up local fabrication units to supply sanitation entrepreneurs in the market. In Nigeria, the STS intervention attempted to work with local metal fabricators, but the complexity and cost of manufacturing the mold dissuaded vendors. As a result, the intervention provided the molds to entrepreneurs at highly subsidized prices.

Public goods are non-excludable resources that support all elements of the sanitation market, and can be broadly classified into one-off goods that are typically required at the start of MBS interventions (e.g., product designs, loan product development) and ongoing goods, such as behavior change campaigns. Public goods can be developed by the government, development institutions, or the private sector.

One-off public goods include un-patented or freely licensed technology solutions and product designs for the local context, availability of market intelligence such as demand assessment studies to support target market selection, sales and marketing tools (e.g., product flipcharts, posters with “triggering” messages), and technical and quality standards. On the demand side, one-off goods that reduce the affordability barrier include the design of open source sanitation loan products that can be adopted by financial institutions, or innovative subsidy designs and targeting mechanisms that can be transitioned to longer-term actors such as the government.

Ongoing public goods include demand activation mechanisms (e.g., sales agent models featured in the WaterSHED and iDE interventions in Cambodia and 3Si intervention in Bihar) since they raise awareness and consumer appreciation for the benefit of toilets. Disseminating information on subsidies so that eligible customers can make use of them, or government or donor-funded awareness raising or demand generation campaigns (such as the *Swachh Bharat* campaign in India, *Man is Health* in Tanzania, and *Stop the Diarrhea* campaign in Cambodia) also act as public goods since the potential increase in demand can benefit all sanitation enterprises in a market. On the supply side, coaching and mentoring programs to disseminate the information and know-how on the sanitation enterprise models can be a public good, if it is available to all entrepreneurs. WaterSHED and iDE's Cambodia interventions developed training modules to offer business advisory support on an ongoing basis to all entrepreneurs who were willing to supply toilets in a manner consistent with the products' technical and quality guidelines. Providing ongoing public goods incurs more significant costs that are typically subsidized by donors or governments. The challenge in most markets is that the funding, provided by donors, is transient in nature and linked to intervention horizons.

Market rules include taxes and tariffs, laws, regulations, and policies. Shaping these to enable the sanitation market, support increasing demand, and/or improve entrepreneurs' viability, is the role of the government at all levels—national, regional, and local (Pedi and Jenkins 2013a).

Market rules can address various barriers to customer participation in the sanitation market, like market-compatible targeted subsidies to poor households that enhance affordability. Market rules that affect willingness to pay take numerous forms, including building codes or by-laws that authorize permits only for properties with toilets or that only release housing subsidies to those who construct toilets. Penalties through denial of service or surcharges on households without toilets also shape customers' willingness to pay. For example, water supply boards in Honduras provide new connections only to

households with functioning toilets, while Uganda prohibits the sale or lease of property without toilets. Such policies, however, create challenges because they risk inequitable treatment if applied to households that cannot afford toilets. They also can be difficult to enforce, especially in the context of informal housing.

Market rule adjustments by government to enhance the viability of the sanitation enterprise can include reducing tariffs and taxes on raw materials used for constructing toilets, providing direct support to entrepreneurs by facilitating priority access to critical raw materials, or providing entrepreneurs with assured product or service orders to institutions like schools or local government offices. For example, in Benin the government provided incentives to local masons to set up sanitation enterprises in their villages by offering contracts to construct toilets in schools.

The broader context also includes supporting functions such as capital, associated supply chains, and market rules that are not exclusive to the sanitation market. In the next section, we explore this realm, which, unlike the business environment, is beyond interveners' ability to influence.

4.5 BROADER CONTEXT FOR MARKET-BASED SANITATION

MBS is based on the premise that consumer demand for toilets exists and that suppliers from the private sector are willing and able to meet that demand. Business models and products, if designed in a way that suits the context, can catalyze market activity and increase market depth. Yet MBS is one of many approaches to improving access to sanitation products, and its effectiveness depends upon the broader context.

Social norms shape a community's acceptance or sanction of open defecation and attitudes toward toilets. Norms vary across and within markets, depending on factors like income, ethnicity, gender, and region (Devine 2009). Social norms also may affect the availability of sanitation entrepreneurs for toilet maintenance and fecal sludge management services. For example, in Malawi, digging pits for toilets is likened to digging a grave, and cultural norms dictate that only men should engage in the activity. In Madagascar, digging a pit for human waste was considered an insult to ancestors who were also buried underground. On the other hand, our interventions case studies did *not* show evidence that cultural norms inhibited the sale and construction of toilets as a business.

Sexist gender norms did reduce the participation of women as entrepreneurs and demand activators in certain contexts. In Cambodia, only 7 percent of iDE affiliated sanitation enterprises were run by women, although some of the most successful sales agents were in fact women (Wei et al. 2014). In Benin, while overall, close to 50% of the demand activators engaged by PHA were women, participation varied widely by locality; in the Hills department, for example, women's participation was limited because of a prohibition on women speaking in public, and in Borgoru, the husbands of female demand activators prevented them from carrying out their activities (Codja et al. 2009).

Infrastructure, primarily transport, has a significant impact on the determination of potential markets for sanitation enterprise – especially in rural areas. Regions with poor or non-existent transport infrastructure see substantially higher cost of supply and prices of toilets, especially where communities are widely dispersed. Rural Benin had poor road connectivity, high transportation costs, and an elevated level of rural-to-urban migration among masons. Even though 18,000 unsubsidized toilets were sold over five years under PHA, this amounted to two toilets per locality per year.²¹ The intervention subsequently shifted focus to urban areas and included CLTS as an approach to accelerate rural sanitation coverage and progress toward Millennium Development Goal (MDG) targets for the nation.

²¹ Estimate based on unsubsidized toilets constructed, geographic coverage area, and number of masons supported by the PHA program in rural Benin.

Macroeconomic factors such as interest rates have a direct impact on the viability of sanitation enterprises. High interest rates limit the ability of sanitation enterprises to invest in equipment or meet working capital requirements, which in turn impacts their viability. Broader variables, such as employment rate and per capita income, women participation in workforce, savings rate, and non-farming income significantly impact households' disposable income levels and ability to afford relatively large purchases such as consumer durables and toilets (Heim 2009). The performance of the agriculture sector in agrarian rural economies has an impact on both customer demand and sanitation enterprises' viability. Even more pronounced in agrarian economies is the impact of cash flow leading to seasonality of the business. In such markets, sanitation enterprises experience peak sales after the harvest season when customers typically have financial liquidity and capacity for sizeable purchases. In regions where iDE Cambodia is active, many customers placed orders throughout the year but requested delivery and fulfillment of payment in the harvest season, which raised the risk of cancellations for sanitation enterprises.

Environmental factors such as topography, hydrogeology, and soil conditions also influence the choice of available sanitation technology solutions and may raise the cost of toilets.

Box 5: Impact of geographic conditions on the market for sanitation in Cambodia

The Easy Latrine product is unsuitable for regions that are prone to flooding or have high groundwater levels. iDE Cambodia developed two product options for flood prone areas, since they accounted for 88 percent of customers living in challenging environments. The product costs for these regions rose above US \$200, compared to US \$35 to \$50 in the rest of Cambodia, which made them unaffordable for many customers. In addition, customers in flood-prone areas did not see value in hygienic toilets compared to their existing toilets, which flushed waste into flood water, thus decreasing their willingness to buy improved toilets. iDE Cambodia estimates that promoting the adoption of hygienic toilets in flood-prone areas could require subsidies amounting to US \$79 to \$175 per household for materials alone and an additional US \$150 per household toward skilled labor and the superstructure (Wei et al. 2014).

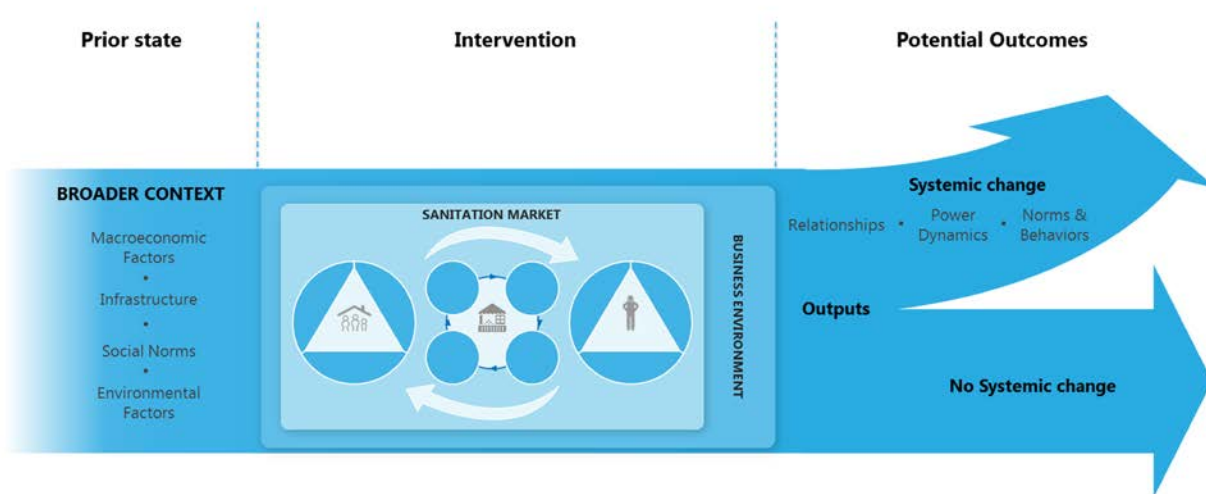
Challenging conditions are exemplified by high water tables or perennial or high risk of flooding, which cause pits to get flooded or contaminate ground water. In parts of Asia, “floating villages” (i.e., houses built at the edge of water bodies) exist, which require new product designs for fecal containment. Loose or unstable soil and sand raise the risk of pits collapsing. By contrast, rocky or stony terrain makes installation of pits difficult. Challenging environments demand alternative products, which may entail radically new designs rather than adapting existing designs that are used in stable or conventional environments. However, new or unfamiliar product designs may be expensive and product innovation alone may not suffice—heavy subsidies may be necessary to shift communities to improved sanitation, as the example of flood-prone regions in Cambodia shows (Box 5).

The challenges that the broader context may pose suggest that MBS alone may not be adequate in all contexts and might warrant alternative approaches to complement MBS. However, literature on MBS and case study research provides limited evidence on specific approaches or their efficacy to address barriers in the business environment or to acknowledge and adapt to the broader context for sanitation markets.

5.0 MONITORING, LEARNING, AND EVALUATION

Monitoring, Learning, and Evaluation (MLE) is an important component of the MBS framework presented in this document, represented by the “Outcomes” on the right-hand side of the framework in Figure 13. We gleaned few insights on MLE as part of our survey of the MBS literature and intervention case studies, and thus offer some novel thinking on MLE for complex systems that is particularly relevant for the complexity of sanitation market systems (Preskill and Gopal 2014). Below we provide a series of guiding principles supported with examples from the interventions, where relevant.

Figure 13: Outcomes in a sanitation market system



Appreciate that the context continually evolves and while an intervention might lead to outputs; desired outcomes depend on the way the intervention is designed, implemented, and evaluated

While it is difficult for a market-based intervention to result in a change in the broader context, over a period of time it can help push the system towards desired outcomes such as greater inclusion or sustained behaviors, if the intervention is designed and implemented in a manner that supports the players/norms that are helping these trends. While a MBS intervention generally does result in desired output (such as a higher number of toilets, number of entrepreneurs involved) it might not result in a meaningful long-term change in the market system outcomes (e.g., inclusion of marginalized communities, sustained and viable entrepreneurs, sustained toilet usage)—represented by the “No systemic change arrow” in Figure 13. For example, if an intervention results in higher toilet sales by enterprises it supports (“output”) but if sales or entrepreneurial activity cease once the intervention ends then one might argue that the outcome is an unchanged system. Therefore, it is important for MLE systems to differentiate outputs, which tend to be shorter-term objectives, from outcomes, which represent progress towards longer-term positive goals, and monitor both.

Learning how and why certain outcomes are—or are not—being achieved is crucial for improving intervention strategy and identifying conditions for replicability

A robust MLE strategy should facilitate learning about not just whether, but also *how and why* progress has or has not been made, such that it produces actionable recommendations for interveners. The “L” in MLE is essential.

The *how* refers to how the inputs and outputs lead to certain outcomes (for example, providing subsidized capital to MFIs enables some of them to profitably offer sanitation loans to low-income consumers at affordable interest rates), whereas the *why* refers to the reasons that outcomes are or are not achieved (for example, not enough MFIs choose to offer sanitation loans, despite the subsidized capital, because they still consider non-income-generating loans to be too risky to include in their loan portfolios). This information then helps interveners to decide whether and how to adjust their approach.

MBS interventions should monitor relationships, power dynamics, and social norms; often, changes in these parameters help explain the path from outputs to outcomes

Most implementers have some system for measuring inputs (e.g., money and staff time), activities (e.g., business development support for entrepreneurs), outputs (e.g., number of entrepreneurs supported); some also measure outcomes (e.g., number of toilets sold in the market and not just enterprises supported or monitored by an intervention). While this allows implementers to understand *what is changing*, it does not necessarily tell them *how or why* change is occurring. In many cases, the relationship between action and outcome may not be unidirectional (Preskill and Gopal 2014). Myriad factors beyond intervention activities/outputs influence outcomes, and the outcomes often influence the activities/outputs as well. MBS implementers must seek to monitor changes in aspects of a market system that mediate the causal relationship between activities and outcomes but which may be much more difficult (if not impossible) to quantify. These aspects include changes in social norms, relationships, and power dynamics among stakeholders in the sanitation market system (Preskill and Gopal 2014).

Because of the difficulty in measuring these variables, traditional monitoring and evaluation (M&E) systems tend to ignore them. In addition, interventions may not be able to directly influence them because they are often deeply entrenched in the target market system. One example of the importance of relationships is the Bihar case, where the 3Si intervention could not change the fact that customers preferred interacting with traditional sanitation value participants rather than newly established businesses (Box 6)

Box 6: PSI’s learning experience with delivery models in Bihar

In Bihar, PSI initially introduced turnkey solution providers (TSPs), distinguished by their delivery model, as sanitation enterprises. TSPs were setup and managed by existing traders (hardware stores) who were promoted by PSI as sanitation entrepreneurs and tasked with stocking all the components required for a toilet in a new outlet. PSI believed that the TSP model would make the buying process easier for customers, since they would not have to aggregate the different components themselves. However, they soon realized that this model was not successful and identified why.

PSI learned that customers preferred to purchase toilet components from CRMs who were traditionally part of the sanitation value chain. Since the entrepreneurs who setup TSPs were new entrants in the sanitation value chain, customers were not comfortable buying from them. Further, these entrepreneurs lacked expertise in service provision, the TSP model had high working capital requirements, and the product was more expensive (as the TSP would add a margin on each component).

As a result of this experience, PSI changed its approach and selected CRMs as focal point enterprises. The CRMs played the role of a “light touch” market aggregator by providing customers with links to other actors (e.g., mason, suppliers for other components or raw materials). Since customers considered CRMs as sources for sanitation products, CRMs were well placed to advise customers. Further, CRMs had expertise in providing sanitation services and managing masons. Also, the aggregate cost of purchasing components from individual suppliers was lower than that of a toilet offered through TSPs. These changes to the model incorporated what PSI had learned, and the resulting CRM-focused model proved to be successful.

Understanding why outcomes were not being achieved allowed PSI to adjust its approach and deliver greater impact.

Performance data should be collected at three levels: (1) household/community, (2) entrepreneur/sanitation enterprise, and (3) the business environment (Pedi and Jenkins 2013b). The MLE activities of most MBS interventions tend to focus on outputs and outcomes at the household/community level, such as toilet purchases or changes in sanitation-related behaviors. Rarely is information captured on supply-side or sanitation enterprise-level outcomes. At most, interventions may track outputs, such as the number of sanitation entrepreneurs trained or the quantities of inputs distributed to sanitation enterprises; indicators related to business performance, other than sales, and viability are not typically measured, but they should be. Changes in the business environment could significantly influence the intervention and should be monitored where possible. For example, changes in government policy, such as the introduction of a new toilet subsidy, could have major consequences for sanitation enterprises.

Figure 14 provides an illustrative set of indicators that an MBS intervention may want to track as part of a robust MLE system. These are admittedly not straightforward to measure, though select implementers have attempted to do so. WaterSHED's Rural Consumer Adoption Study garnered consumer opinion on the reliability of sanitation enterprises, and World Bank WSP's formative research on demand in Cambodia ascertained an inherent lack of trust in masons (Salter 2008). The strength of supplier linkages or referral networks can be ascertained through rating mechanisms such as PSI's Enterprise Capacity Assessment Tool (ECAT), which measures the number of on-call masons for peak season or strength of relationships with hardware stores (e.g., free or commission-based referrals, availability of trade credit).

MLE should be an iterative process, with multiple feedback loops that facilitate improvements in intervention strategy

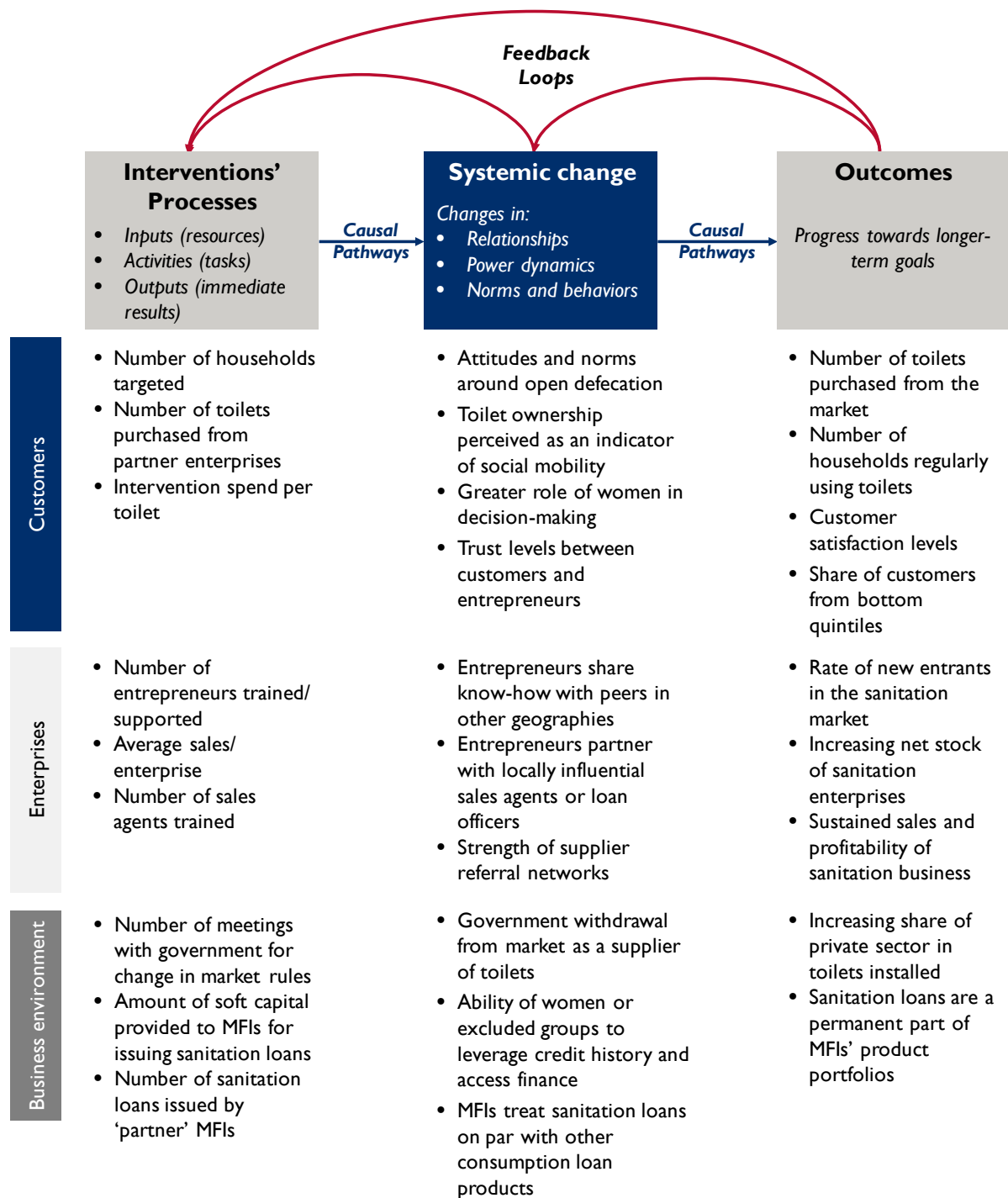
There is a multi-directional relationship among outputs, the change process, and outcomes. In addition, an intervention's outcomes can actually influence the market system itself, thereby changing the business environment and market interactions mid-way through the intervention; implementers must be attuned to these changes and be ready to adjust implementation accordingly—in other words, have an adaptive management strategy (USAID 2018). A robust MLE system for MBS should be similarly iterative (Preskill and Gopal 2014).

Traditionally, M&E systems have collected data once at the start of the intervention, once at a midway point, and once at the end of the intervention. This process is designed to capture the baseline conditions, check progress halfway through and course-correct if required, and evaluate deviations from the baseline at the end of the intervention. This approach makes sense in theory, but in practice, measuring progress only at a midway point may not provide implementers with sufficient opportunities to learn what is happening and to adjust their interventions accordingly.

A flexible and continuous learning approach often begins with prioritizing an initial set of learning questions. Continuous data and feedback collection by evaluators and program staff helps generate information about what is working and what requires attention. Tools such as rapid feedback debriefs, critical incident reviews, after-action reviews, and learning memos can aid the generation of this steady flow of information. Formal and informal learning sessions involving a broad group of stakeholders to delve deeper into the data helps funders and implementers understand the “why,” including changes in the operating environment and context. As insights emerge and influence program strategy, the evaluation is adapted by re-prioritizing learning questions and adding or eliminating data collection activities and sources. Such a process entails periodically expanding or contracting resources for evaluation in addition to ensuring that interventions have a well-qualified MLE team (Preskill and Gopal 2014).

These lessons are not only useful to the intervention in question; they can and should also be documented and shared with the broader MBS field to allow other funders and implementers to take

them into account when designing, assessing, or adapting their own interventions, helping to amplify the impact of an intervention by allowing others to compare different approaches and identify what elements might be worth scaling up or replicating in other contexts.



Box 7: Transfer of lessons in Tanzania

In Tanzania, WSP's Total Sanitation and Sanitation Marketing (TSSM) intervention provides an example of this iterative MLE cycle, as well as of the importance of learning and sharing lessons. Intervention implementers found that promoting masons as sanitation entrepreneurs was not an appropriate supply-side strategy for multiple reasons, including masons' lack of entrepreneurial mindset and commitment to the sanitation sector. As a result, WSP adjusted its intervention to start working with hardware stores as sanitation service providers in place of masons. However, it appears that this lesson was not transferred when the Government of Tanzania, with the help of DFID, scaled up the TSSM intervention as a national program. The larger national program reverted to promoting masons as sanitation entrepreneurs and ultimately faced the same difficulties as the WSP intervention had. If the lessons learned by TSSM had been transferred by the government to the new national program, the same mistakes may have been avoided.

MBS interventions should employ a combination of MLE methods that balance the need for analytical rigor with the need for rapid decision making

The selection of the best MLE method(s) for a given intervention depends on the intended use of the information gathered, the audience, and the speed with which the information is required. MBS interventions should employ a balanced combination of rigorous methods, such as quantitative surveys and random assignment studies, with less rigorous methods, such as rapid appraisal methods that involve quick, low-cost collection of information to facilitate adaptive decision making.

Box 8: RCT in WaterAid Nigeria

In Nigeria, WaterAid opted to carry out a Randomized Control Trial (RCT) for its Sustainable Total Sanitation (STS) intervention to generate evidence of its effect. The design of the RCT was extremely detailed, going so far as to identify specific individuals to include as entrepreneurs in the intervention, and strictly limiting the markets in which those entrepreneurs could sell, to ensure separation of treatment and control groups. During implementation, two complicating events occurred: many of the identified entrepreneurs dropped out, and customers from control areas expressed interest in purchasing toilets. However, due to the rigid nature of the RCT design, WaterAid was not able to recruit new entrepreneurs or allow existing entrepreneurs to cater to unmet demand in control areas, resulting in lost opportunities to improve intervention outcomes.

Rapid assessment methods (e.g., critical incident reports), on the other hand, may allow for a quick and relatively inexpensive collection of data from stakeholders, thereby generating timely information for decision-making. Rapid assessment methods can also help provide a steady stream of data at a lower cost, though attention must be paid to data quality trade-offs. Other strategies include using existing data collection efforts (for example, coverage data already collected by government agencies), employing ICT measures such as mobile phones and GPS for data collection.

6.0 CONCLUSIONS

Existing sanitation markets in many developing countries are characterized by failures that range from inappropriate products to inadequate supply. Together, these failures exclude many households from access to toilets. Interventions by funders, implementers, and governments often are needed to shift markets toward greater inclusion. In this section, we offer specific guidance, based on the interventions analyses and literature survey, that each of these stakeholders might consider as they fund, design, and support market-based sanitation.

6.1 GUIDANCE FOR SANITATION FUNDERS²²

This review defines funders as bilateral or multilateral aid agencies (e.g., USAID, World Bank) or large foundations (e.g., Bill and Melinda Gates Foundation, Stone Family Foundation) that fund sanitation development with a mandate to intervene in markets to increase inclusion. As such, they tend to operate on the basis of grants that support the work of on-the-ground grantees, or implementers. Funders may lack a strong on-the-ground presence in the markets where they intervene and thus be less suited to directly manage interventions. Instead, their strength lies in their financial and political capital, enabling them to push for broader changes to improve the business environment for MBS. The following points consider the capabilities and limitations of funders and suggest actions through which they can maximize their impact.

I. Recognize that MBS alone might not be adequate in all contexts and that conditions often warrant complementary and compatible approaches.

MBS is rarely suitable to be applied alone. As Box 9 illustrates, MBS is the right tool under a certain set of conditions, but in others it might be part of a suite of approaches, or else not effective at all.

Funders who wish to pursue MBS should assess whether a given market has the right conditions to support an intervention of this kind:

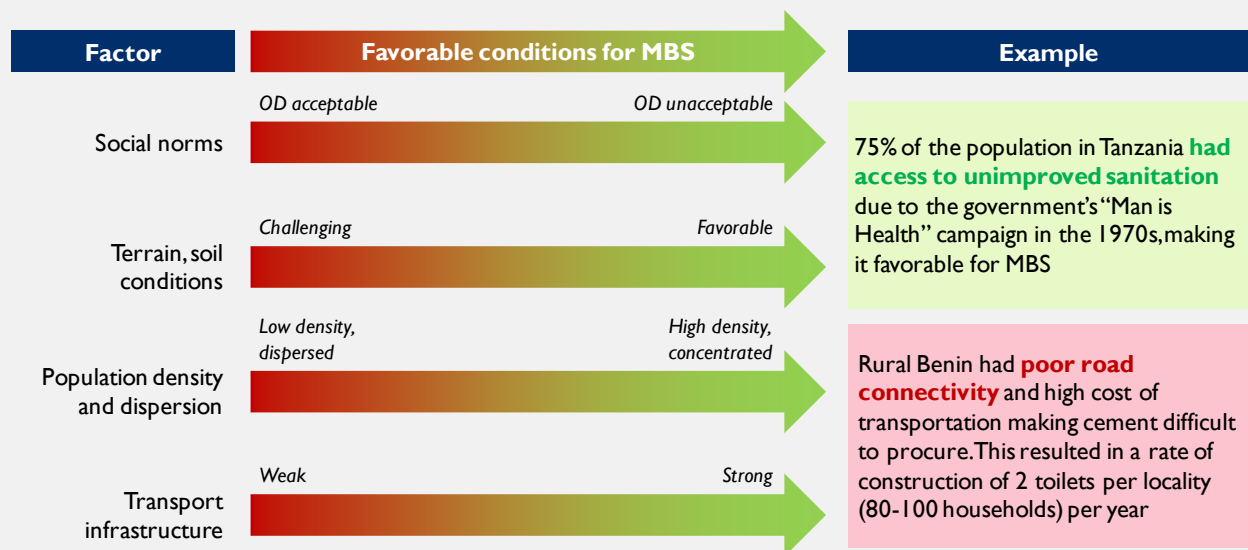
- **Understand local conditions.** Locations with challenging topographical, hydrogeological, or soil conditions may require expensive and unique solutions and will be hard to serve economically. MBS is unlikely to work in hard-to-reach geographies, such as areas that have poor transportation infrastructure or that are sparsely populated, because they lack a critical mass of customers required for viability. Funders should consider whether an intervention will require complementary subsidies or mechanisms to extend the reach of sanitation enterprises to these markets.
- **Ascertain latent demand.** Funders should understand the degree to which customers in the market *want* improved sanitation solutions. Demand can be determined by conducting field surveys or by exploring what demand generation activities have been conducted and their success. If a funder determines that latent demand for toilets does not exist, MBS may not be the correct approach for that market.
- **Consider social norms.** Funders should also explore the subtler, but often more challenging, prevailing social norms. In some communities, open defecation is acceptable or encouraged. Even if demand generation mechanisms have been deployed, customers may not see the value of toilets. In this case, funders may wish to focus on changing existing norms around sanitation before taking an MBS approach.

²² These funders, for the purposes of this discussion, do not include for-profit fund providers, such as private equity investors, that may be investing in sanitation companies.

Box 9: The importance of context

Context: A key determinant of the applicability of MBS

Broader contextual factors ranging from social norms and informal rules to geographic conditions determine the applicability of MBS as a solution to the sanitation challenge. These factors are beyond the control of an MBS intervention and either entail a long arch of change or require alternative approaches such as CLTS.



In markets with unfavorable contexts, MBS can be complemented with non-market mechanisms such as behavior change communication aimed at demand generation to extend its reach

II. Participate in the sanitation market system.

Since funders generally lack a strong on-the-ground presence, they need to work through and with other actors in the sanitation market system. This involves understanding the full array of actors, including other funders, implementers, and governments, who are present at different levels of the sanitation market system. Funders should consider working with actors who have a strong local presence, are long-term participants, and are best suited to address a particular barrier. This could entail supporting implementers with ongoing MBS interventions, partnering with other funders and enhancing cross-system intervention capability, or working with governments at various levels (i.e., national, regional, and local), especially to improve the business environment. Given that funders will become a part of the system in which they intervene, such a strategy will help them determine where they are best suited to intervene based on their objectives and existing capabilities.

III. Address the business environment.

One way of creating impact for funders in a sanitation market system without becoming part of the core demand-supply mechanism is to work within the broader environment that enables sanitation businesses to thrive. Such an approach could involve strengthening associated supply chains that support sanitation markets (e.g., cement). It could also mean developing public goods in the form of open-source product designs or marketing and sales tools to activate latent demand for toilets, or else pushing for changes in formal market rules to increase entrepreneurs' ability to operate.

Funders are better suited to deploying their capacity outside of the immediate sanitation enterprise, considering their distance from the market. These interventions can come on any of the aforementioned key dimensions of public goods. Funders, for instance, can use their financial capital to strengthen supply chains. They might support open source design of appropriate product systems, demand activation mechanisms, and delivery models. Alternatively, they may draw on their political capital to work with governments in shaping policy change. In markets with rules that favor direct participation by the state or crowd out the private sector, advocacy can influence governments at national or sub-national levels to shift policy toward providing public goods like sanitation. Interventions of this kind do not directly develop business models for sanitation enterprises, yet they lie at the core of any MBS approach because they can unlock entrepreneurship potential by improving the business environment.

Funders should consider placing multiple bets in the same sanitation market system to ensure sustainability and foster an environment of competitive collaboration. Such an approach allows for rapidly testing multiple strategies and identifying appropriate interventions for an effective MBS intervention.

IV. Invest in long-term change.

Changing the business environment and the broader market system takes time. Just starting up a sanitation enterprise may take months. Ensuring that an enterprise can operate effectively and thrive over time, however, requires an even longer-term engagement, as does altering the fundamental conditions of a market system. Funders who support MBS interventions should commit to long-term interventions to take advantage of the scale-up phase, which can take four to six years to emerge even in the most successful interventions (see section 3.1.3). This, together with providing more flexibility to the implementer as market conditions change, will provide for the best opportunity to create impact at scale.

V. Adopt MLE systems that encourage learning and measure systemic changes.

Funders should aim to understand changes in *how* stakeholders in the market system interact with each other; this lets them determine which elements of an intervention to alter and how, as well as which elements to scale up or replicate elsewhere. Investing in MLE systems that facilitate learning how and why progress occurs, or why it does not, can help funders track how the market system evolves and determine the stickiness of the intervention.

To understand the *how* and the *why* of change, funders must also monitor changes in the more-difficult-to-quantify aspects of a market system, include changes in relationships among stakeholders and changes in social norms related to sanitation.

Robust MLE systems need to be iterative, and funders should regularly incorporate data and lessons into an intervention strategy. Given that frequent data collection is time-consuming and expensive, funders can combine rigorous MLE methods (e.g., impact evaluations) with less rigorous methods (e.g., rapid appraisal) to collect data in a cost-effective yet consistent manner.

6.2 GUIDANCE FOR IMPLEMENTERS

Implementers oversee the design and implementation of interventions on the ground and have a strong local presence in the markets where they operate. They are supported by funders and depend on grant conditions to determine where and how they can intervene. For the most part, programmatic MBS implementers are local or international NGOs, yet sub-divisions of multilateral organizations (e.g., WSP) and governments also can act as implementers. In contrast to funders, implementers have limited ability to change market rules and prevailing norms.

I. Actively build exit strategies into the program during both design and implementation stages.

Fostering private sector participation in sanitation product and service provision requires careful attention to sustainability and the vision of thriving markets eventually persisting without continuous external support.

II. Understand the predictors of effectiveness and viability and plan accordingly.

The sanitation enterprise is the connecting element between customers (demand) and entrepreneurs (supply) that facilitates market activity. The following approaches are consistent among successful MBS interventions:

- **Target the sanitation market in sweeps.** Formative market research can involve measuring how many customers are likely to adopt improved sanitation solutions with relative ease and how many customers are averse to using toilets, as well as the degree of innovation required in that market. Based on assessed conditions, implementers can target the market in sweeps, with early adopters providing the beachhead. By doing so, they can demonstrate the viability of sanitation enterprises early on and gradually expand to other customer segments and geographic contexts by iterating the sanitation enterprise to specific market conditions. In any case, implementers should initially operate where there is substantial potential for sanitation market activity (i.e., product sales) with scope to increase market depth and improve efficiency.
- **Place multiple bets on delivery models.** A common pitfall in designing delivery models is the notion that customers simply want entrepreneurs to aggregate and sell raw materials required for toilet construction. This is unlikely to work in markets where materials are widely available, where customers are accustomed to purchasing from established sources, or where customers are willing to invest time and effort in procuring materials from multiple suppliers to reduce costs. Regardless of the delivery model that implementers choose, they should consider the likelihood that proving a particular model can take years and depends on the product system. Investing in multiple delivery models and product variations can thus reduce the trial cycle considerably.
- **Design locally relevant product systems.** In designing product systems for the chosen target market, implementers should adopt iterative design approaches, such as human-centered design, that consider both customer preferences and entrepreneur capabilities. Introducing radically new designs that either require substantial customer education or increase production complexity can be risky. Re-engineering existing designs and promoting efficient production methods that make use of existing supply chains and capabilities is likely a more sensible approach. Implementers should also explore the potential to standardize the core elements of a toilet (e.g., substructure and interface components) as a way to simplify manufacturing processes and reduce capital investment for sanitation entrepreneurs. They may also deploy a range of sales and marketing campaigns around one product to target different market segments, or develop different product variations that cater to the specific needs of these different segments.
- **Develop a sanitation enterprise-managed demand activation mechanism.** Effectively connecting customers and entrepreneurs requires activating latent demand through active product sales and marketing. Demand activation by independent actors (e.g., sales agents) is often required because such conventional methods as mass marketing and branding may be less effective in persuading households to purchase toilets. Moreover, sanitation entrepreneurs are highly unlikely to undertake demand activation, so implementers can support the market by developing sales and marketing tools. These should be managed and paid for by entrepreneurs, however, to ensure that a sanitation enterprise is sustainable beyond the intervention's timeframe. Implementers also may choose to broker partnerships between entrepreneurs and other actors such as local government representatives, community organizations, or influential

community members that have non-pecuniary interests in promoting sanitation. Working with such partners could alleviate some of the financial and management overhead of directly conducting sales and marketing activities from entrepreneurs.

III. Address customers' ability to pay.

Implementers of MBS interventions should understand the degree to which customers are able and willing to pay for toilets. Ideally, implementers should operate in markets where a critical mass of customers has the financial capacity and the willingness to purchase toilets, yet they also may choose to intervene in a market to address liquidity or affordability barriers to help achieve the critical mass required to attract entrepreneurs and to make sanitation enterprises viable.

Implementers should consider partnering with other actors in the market system to improve customers' ability to pay for sanitation. MFIs, for example, could help improve liquidity by extending credit to customers who wish to invest in toilets. Similarly, community-based organizations that facilitate group lending mechanisms can increase the financial resources available to customers. When working alongside other actors, however, implementers should understand the factors that encourage these partners to operate in the sanitation market. MFIs with limited interest in expanding their non-income generating or consumption loan portfolios may exit the market once the financial incentives or risk-mitigation opportunities provided by a grant no longer exist.

Credit alone is insufficient to overcome affordability barriers. Implementers should consider leveraging subsidies, where they exist, both to improve affordability and to encourage other system actors. Targeted subsidies that are market-compatible (i.e., that enhance rather than undermine market systems) can help the poorest customers pay for toilets, as described below under Guidance for Governments. Further, subsidies in the form of risk guarantees, below-market interest rates, and grants toward operational costs can give incentives to credit providers who are reluctant to provide sanitation loans due to the risks and high costs of servicing non-income generating loans.

IV. Iterate among various elements of the sanitation enterprise to develop a locally relevant MBS.

The design of a marketing strategy, a product system, and a delivery model are all interdependent and shaped fundamentally by the choice of the target market. Conditions are rarely ideal: the target market(s) may have already been chosen by a donor, or challenges with the supply chain may warrant modifications to the delivery model. Similarly, changes in the market may require entirely different marketing approaches or product systems. A particular strategy may not succeed until an appropriate combination of elements is achieved for a given target market, and even then, it will be in flux as the market system changes. The same holds true for interventions in new markets.

Implementers should keep this in mind and recognize that supporting an MBS intervention necessitates constantly active adaptation and a flexible approach. They should remain open to unforeseen changes that can drastically alter the direction of the market and look for ways to capitalize on them as they adapt an intervention. Implementers should see MBS as a continuous learning process, rather than a fixed approach. This perspective will allow them not only to respond more effectively to changes in the market, but also to take advantage of these new realities to drive deeper, longer lasting change.

V. Support entrepreneurs in the market.

The first step toward attracting entrepreneurs is to demonstrate the presence of a sizable, profitable sanitation market. Implementers can then prioritize entrepreneurs that have some exposure to the sanitation market (e.g., those that supply one or more inputs), can access capital or finance (e.g., trade credit or formal/informal debt), and see value in expanding their portfolio to include a sanitation

enterprise as a complementary business line. However, the requisite skills and capabilities necessary to run a sanitation enterprise are not unique, and entrepreneurs coming from different parts of the market (e.g., those with experience managing product-oriented enterprises) often can serve as the focal point business of the sanitation market successfully.

Recognizing that entrepreneurs managing sanitation enterprises can come from anywhere in the market, implementers should assess which profiles are best suited for a given intervention. In addition, implementers should provide additional support specific to operating in the sanitation market. This can include training in production methods or coaching on strategies to improve viability of the sanitation enterprise (e.g., lowering margins, cross-selling products and services). It also can entail providing quality certifications that entrepreneurs can use to strengthen their reputation before customers. If entrepreneurs feel confident in the services they offer and know that customers trust the quality of their services, more of them may be willing to serve the sanitation market.

6.3 GUIDANCE FOR GOVERNMENTS

Governments often have the power and the resources to intervene at any level in the sanitation market system. In a well-functioning market, governments define the formal rules under which market players operate. However, governments have historically also taken the role of suppliers, implementers, or enablers in the business environment for the sanitation market. Unlike funders and implementers, governments also can directly address contextual barriers. Doing so may involve, for instance, improving transport infrastructure that benefits multiple markets within the broader economy.

It is essential to recognize that the responsibilities, capabilities and scopes of action of government vary depending on the level of government with which an intervention engages. For example, national government agencies may shape policy and regulations, while those at the local level may be better suited to conduct demand activation through community leaders and community-based organizations (CBOs). Funders and implementers must understand the nuances of working with governments across levels. The following guidance points focus on the key aspects of the business environment and the broader context on which governments can have a significant impact, assuming that their role should be setting the rules and not playing the game.

I. Shape market rules to encourage private sector participation.

Market rules include laws, policies, and regulations that govern the sanitation market system. Market rules, or the absence thereof, can present both barriers and opportunities to scale the market. To provide an enabling environment for sanitation entrepreneurs to scale, the government can focus on several possible levers.

- **Provide subsidies to improve (rather than distort) market activity.** Governments should frame policies that reserve the use of subsidies as a means of achieving total sanitation coverage. Subsidies should be targeted at the poorest households or those that have been persistently excluded (e.g., communities in challenging environments). Widening the beneficiary base to include households that can afford to pay market prices has the potential to distort the market, especially if subsidies are available for a limited time. Appropriately targeted, results-based subsidies require robust poverty identification systems, which are not exclusive to the sanitation market. Indeed, such identification systems also can benefit funders who seek to target poor households with their own subsidy programs. Yet even with well-designed and well-targeted subsidy programs, governments should work alongside funders and implementers to ensure that the subsidies and activation mechanisms are not at odds with government policies. Governments also can support MBS by providing subsidies to sanitation enterprises. These could, for example, lower the product cost of key input materials that are either expensive or difficult to obtain locally (e.g., plastic pans). Though not targeted to specific segments, this type

of subsidy addresses the affordability barrier while ensuring a level of market participation as customers still pay for their toilets.

- **Address fiscal barriers to improve sanitation market attractiveness for entrepreneurs.** Sanitation entrepreneurs also may incur higher costs of production through policies that affect raw materials ranging from tariffs and taxes to imposing quotas for the domestic market. While these policies are designed with other markets in mind, governments should be aware of the unintended consequences of higher prices for customers and entrepreneurs in the sanitation market. In order to prioritize sanitation, governments could consider mechanisms such as rebates or tax holidays for sanitation entrepreneurs to redress the impact.

II. Invest in changing prevailing social norms.

MBS is supply-side oriented, and alone cannot generate sanitation demand; it requires that customers have the desire to purchase toilets. In communities where open defecation is acceptable or where gender discrimination or other exclusionary norms prevent certain groups from accessing improved sanitation (e.g., women, the disabled), governments have a role in shifting these prevailing social norms. Alternative approaches will be required to drive behavior and social norm change, including CLTS and social marketing campaigns.

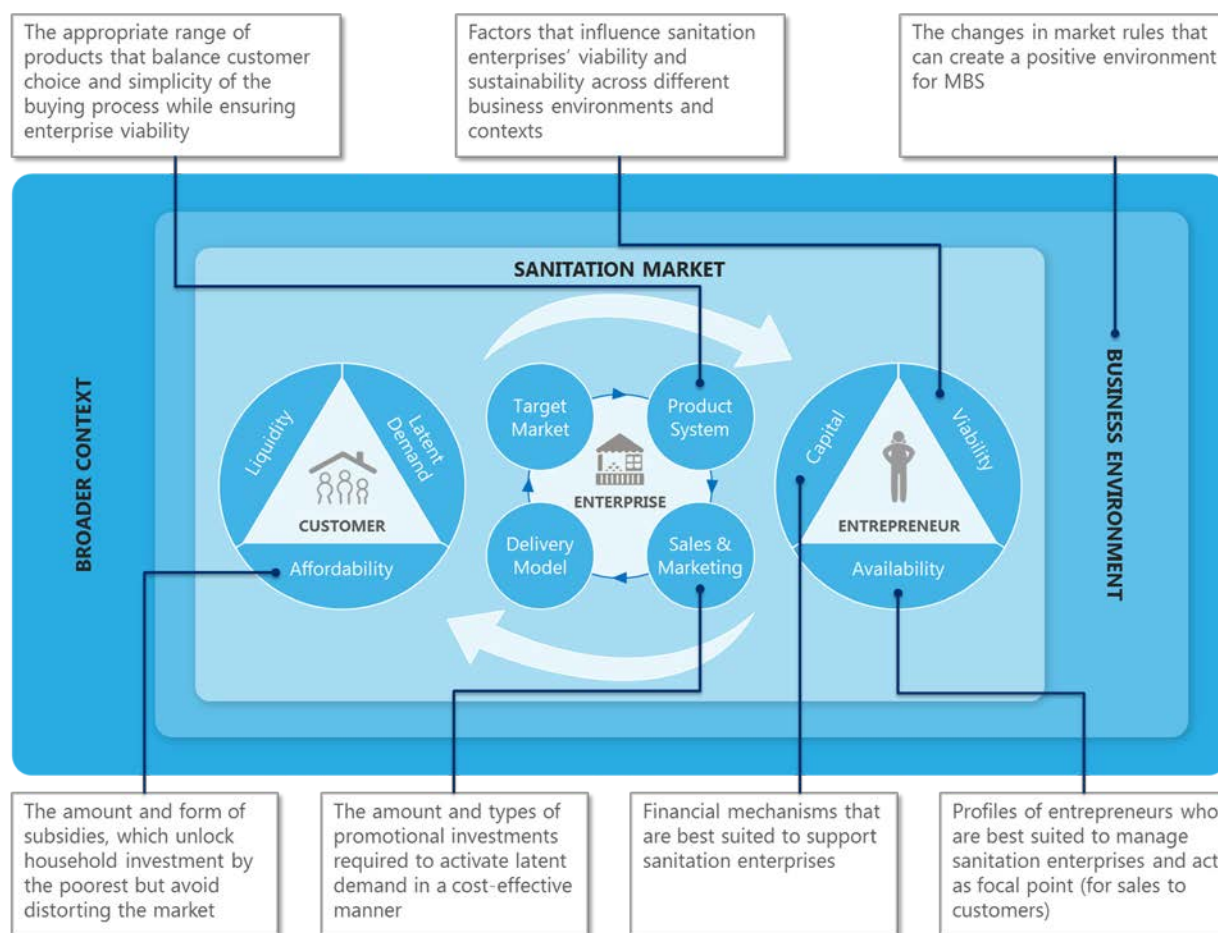
III. Fund the development of public goods for MBS.

Governments can bolster the success of MBS through the development of public goods, which provide products or services that all players can use to better serve the market. Depending on the market, public goods can either directly relate to sanitation or indirectly support it. This means that entrepreneurs can leverage resources (e.g., a new product system or marketing campaign) that they would have otherwise been unable to invest in to drive sales. Public goods that indirectly support the market can be equally valuable. Poverty identification systems, for example, are not designed specifically for the benefit of MBS, but they can more effectively target subsidies. Similarly, MLE tools at the national or regional levels can help monitor both short-term outputs of MBS interventions and long-term outcomes beyond the timeframe of a specific intervention. Often a part of larger government MLE surveys, these can, through their continuity and broad reach, generate essential insights that help shape ongoing and future MBS interventions.

7.0 AREAS FOR FURTHER RESEARCH

We make several recommendations in the previous sections on actions various stakeholders should take to scale market based sanitation. At the same time, we recognize the paucity of rigorous evidence in some areas and the need for further research to augment the evidence base behind the framework. In Figure 15, we highlight the key areas for further research warrant prioritization

Figure 15: Areas for further research



Factors that influence sanitation enterprises' viability and sustainability across different business environments and contexts. This desk review reinforces the hypothesis that sanitation enterprises remain active in the market because of their viability and attractiveness compared to alternative business lines. Long-term viability, however, can be difficult to forecast when many costs, such as demand activation expenses that are funded by donors, are currently absent from enterprise cost structures. Thus, the viability and sustainability of sanitation enterprises—largely conditional on their ability to bring in customers, manage demand activities, and execute other functions—is uncertain once funders exit. Indeed, the question of how entrepreneurs are even attempting to measure viability (through tracking key metrics e.g., unit profitability, return on investment) is not well understood.

Even when profitability is calculated correctly, the key drivers of business viability are unclear; evidence across interventions and from the literature highlights a variety of explanations for why sanitation enterprises might struggle with unit or business profitability. Consequently, we have no universally

effective prescriptions for improving viability, in spite of evident usage of successful tactics in some of our intervention case studies (e.g., increasing geographic coverage, and relying on indirect opportunities).

Another evidence gap remains in understanding the threshold of profitability that encourages entrepreneurs to enter and the share of overall revenue that motivates them to continue operating in the sanitation market. Other factors also may provide incentives for entrepreneurs to continue operating sanitation enterprises, such as the opportunity to cross-sell.

In part, the lack of conclusive evidence about the factors that affect sanitation enterprises' viability and sustainability may be attributed to the diversity of business environments and contexts. We thus need to understand the generalizability of these factors across a range of business environments and contexts.

Financial mechanisms that are best suited to support sanitation enterprises. The research makes clear that enterprise finance helps entrepreneurs grow and reach more customers and that entrepreneurs have traditionally faced challenges accessing finance. Our research highlights a few examples of enterprise financing (largely credit, such as loans from MFIs or upstream credit) that have been provided on a small scale. It is unclear, however, which channel is suitable in which context, given the different profiles and capital requirements of entrepreneurs and sanitation enterprises.

Profiles of entrepreneurs who are best suited to manage the focal point (for sales to customers) sanitation enterprise. A crucial limitation of our analysis of barriers for sanitation entrepreneurs is the lack of conclusive evidence concerning the profiles of entrepreneurs who are best suited to act as a focal point in the supply of toilets to customers. Our findings on the availability of entrepreneurs have highlighted a range of profiles that vary by size, core business (e.g., concrete block production, hardware stores), and assets and capabilities. Further research is needed to understand the performance of diverse entrepreneurs in the market and to identify the archetypes of entrepreneurs best suited to different types of product systems and delivery models.

Changes in market rules that can create a positive environment for MBS. Market rules are a critical aspect of the enabling environment for sanitation markets, ultimately helping to support private sector participation and viability. Appropriate market rules can catalyze the scale of sanitation markets since they can address physical, institutional, financial, and social barriers. The literature and MBS interventions research have highlighted examples of market rules that positively affect sanitation. Evidence gaps exist, however, in terms of the specific market rules (e.g., tax reduction versus a housing policy change with respect to sanitation) required in different contexts. Further, we also need to understand the costs to the government, if any, of changing market rules.

Magnitude and form of subsidies that unlock household investment by the poorest without distorting the market. Our review makes clear that MBS is not applicable in all contexts and often must be complemented with subsidies to reach the poorest customers. Important questions remain regarding the appropriate modality and size of subsidy. While various forms of subsidies (e.g., in-kind, discounts, vouchers, rebates) have been used to promote sanitation, there is limited or mixed evidence of their effectiveness in different contexts. The size of subsidies relative to the price of the toilet must be adequate to unlock investment by poor households but not so high that beneficiaries do not value the purchase. Further research is needed to better determine the optimum form and level of subsidy that will not create market distortions, as well as appropriate qualifying criteria and poverty targeting methods.

The nature of promotional investments required to activate latent demand. Demand activation mechanisms that operate independent of entrepreneurs have emerged as an important element in successful MBS interventions. Demand activation mechanisms employ a range of methods (e.g., mass marketing, umbrella brands, and interpersonal communication) and communication materials

(e.g., flipcharts, posters). These mechanisms often have taken the form of public goods and require donor funding (e.g., for recruiting and training sales agents) to support sanitation enterprises as they supply toilets, at least in the initial stages of market development. Further research is required to understand the types of methods that are most cost-effective and the point at which external funding for promotional investments can cease (as well as the amount of funding required to reach that point).

The appropriate range of products that balance customer choice and simplicity in the buying process while ensuring the viability of the sanitation enterprise. Although offering a range of products caters to the preferences and budgets of unique customer segments, findings from the intervention case study research suggests that customers may not respond favorably to too many product options (e.g., choice in substructure, superstructure, and interface). Some observers have suggested that excessive choice can leave many customers overwhelmed by the decision-making process, ultimately prompting them to postpone purchasing decisions. A wide range of options, especially for components such as the toilet slab or superstructure, can increase inventory costs and reduce the viability of the sanitation enterprise. Developing an appropriate range of products is thus essential to maintain customer choice and a simple buying process alongside sanitation enterprise viability. Current evidence does not suggest what that range is, and further research is needed.

ANNEX I: METHODOLOGY FOR THE LITERATURE SURVEY

We followed a systematic, multi-stage process to prepare a repository of literature. The aim of the process was to ensure broad coverage of sector literature while maintaining a manageable, yet representative, repository of documents for close review.

SOURCE SELECTION

The process began with the identification of databases from which to draw documents for survey. Seven sanitation sector-specific sources were selected in consultation with experts.

- SuSanA (Library, Case Studies, and Thematic Discussion Series sections)
- Water and Sanitation Program (WSP) Library
- International Rescue Committee (IRC) WASH Resources
- Water Supply & Sanitation Collaborative Council (WSSCC) Resources
- Water, Engineering, and Development Centre (WEDC) Conference Papers
- Waterlines Journal
- *Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) Library*

SEARCH STRATEGY

We used a set of 16 search string combinations (finalized in consultation with experts) to search the shortlisted databases and arrive at a long list of documents. Where necessary, we adapted search strings to the syntax of the source search engines. We used thirteen search string combinations related to the three evidence gaps cited (finance, entrepreneurship, and business model and products) and three broad sectoral strings to capture relevant documents outside of those evidence gaps. The table below contains a full list of search strings used.

Issue area	Search strings
Finance	<ul style="list-style-type: none"> • “Consumer Finance” AND “Sanitation” • “Business Finance” AND “Sanitation” • “Enterprise Finance” AND “Sanitation” • “Microfinance” AND “Sanitation”
Entrepreneurship	<ul style="list-style-type: none"> • “Entrepreneurship” AND “Sanitation” • “Women Entrepreneur” AND “Sanitation” • “Business Development” AND “Sanitation” • “Small Business” AND “Sanitation” • “Sanitation Entrepreneur”
Business Model and Products	<ul style="list-style-type: none"> • “Sanitation as a Business” • “Product Development” AND “Sanitation” • “Business Model” AND “Sanitation” • “Toilet” AND “Design”
Global	<ul style="list-style-type: none"> • “Public Private Partnership” AND “Sanitation” • “Sanitation Marketing” • “Private Sector” AND “Sanitation”

DATA MANAGEMENT

We downloaded the results for the different search string-source combinations into Mendeley, a software application for managing research and references that is used across the WASHPaLS project. We limited the download of documents for search string-source combinations, which resulted in a large number of results, to the first fifty results (sorted by relevance) in order to maintain a manageable repository. We tagged each document (using a Mendeley feature) with the evidence gap area that corresponded to the search string used to find the document (e.g., “F” for finance, “E” for entrepreneurship). We used Mendeley software to remove duplicates and consolidate the evidence gap area tag(s), resulting in an initial set of 1,429 unique documents.

PRIORITIZATION

We screened and categorized documents in terms of their relevance to the literature survey scope and the usefulness of the insights they contained. The screening process entailed a “quick” scan of title, abstract, executive summary, and/or main body (depending on the document structure), and we then categorized the documents according to the following criteria (where 2 represents the highest priority).

Priority	Criteria (can meet any of these)
2	<ul style="list-style-type: none">• Focused on single/multiple countries, single/multiple interventions, themes/topics of interest• Contains lessons/recommendations• Peer-reviewed
1	<ul style="list-style-type: none">• Of limited relevance to market-based solutions in sanitation
0	<ul style="list-style-type: none">• Article does not refer to any sanitation solution in which the user makes a full or partial monetary contribution toward the purchase, construction, upgrade, and/or maintenance of a toilet• Article primarily talks about solution or interventions that are not limited to the toilet interface• Meets above criteria – for either priority 1 or 2 – but contains only very high-level information

After eliminating the priority level “0” documents, the count stood at 595, which comprised 340 high-priority documents (“2s”) and 255 lower-priority documents (“1s”) (Figure 1.1.)

While we tagged documents by the issue area of the search string through which we found them, we often gleaned insights from all issue areas within each document. The document total for each tag in the figure, therefore, is only a rough proxy for the number of insights found on evidence gap area(s) pertaining to that tag (Figure 1.2).

CAPTURING INSIGHTS

We reviewed documents over the course of approximately 10 weeks, closely reading priority “2” documents and scan-reading priority “1” documents for additional insights. While reading each document, team members captured key insights within a purpose-built template. The template had approximately 40 headings to capture insights from each source around specific aspects of each of the three evidence gaps, overarching insights, and general contextual and bibliographic information.

SYNTHESIS OF INSIGHTS

The above template, once filled out with insights from all 595 documents, contained nearly 3,800 separate insights. We then consolidated and summarized these in a series of synthesis documents, one

for each evidence gap area, and paid special attention to tracking the original source(s) for each synthesized insight. These synthesis documents then formed the basis of the literature survey report.

Figure I.1: Systematic approach to selecting and prioritizing literature for review

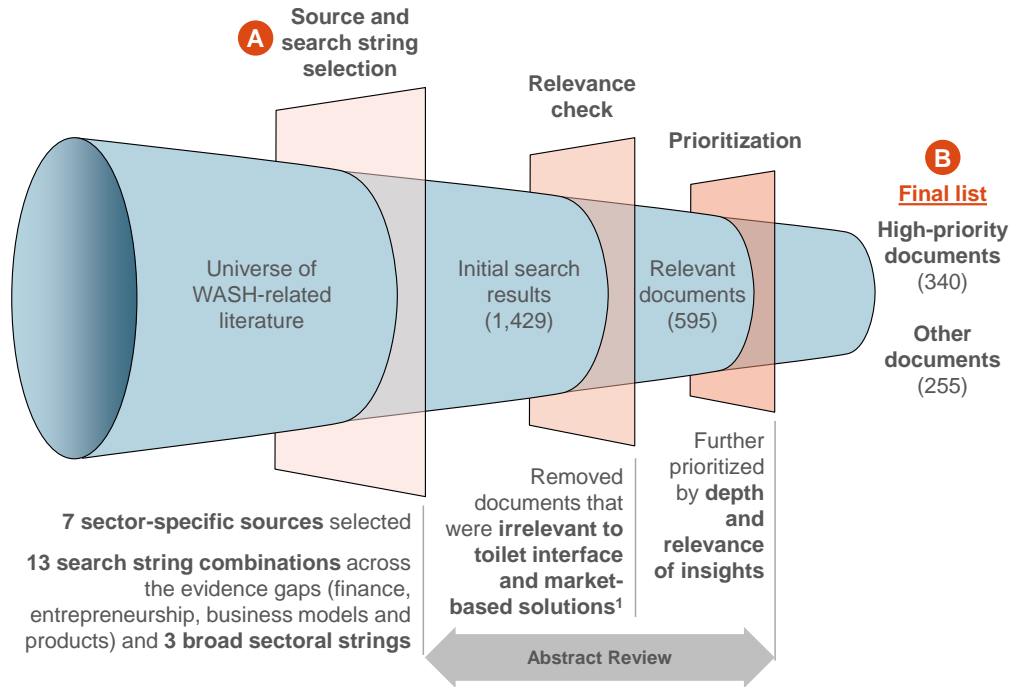


Figure I.2: Universe of documents for close review

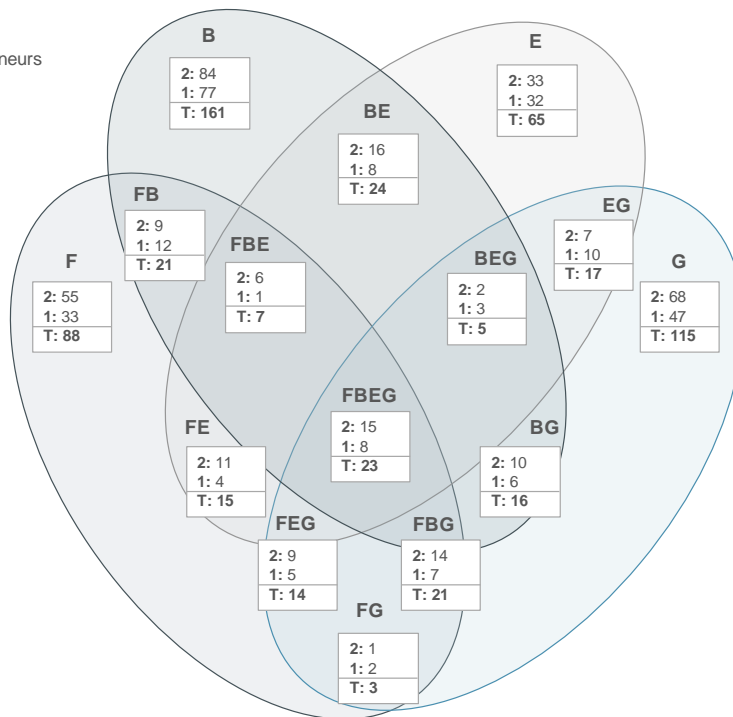
Legend for issue area tags

- B = Appropriate business models and products
- E = Availability and viability of sanitation entrepreneurs
- F = Unlocking public and private finance for MBS
- G = Global

2: High-priority sources
1: Other sources
T: Total sources

Totals

2: 340
1: 255
T: 595



ANNEX 2: METHODOLOGY FOR INTERVENTION CASE STUDY SELECTION

The aim of the interventions review was to identify key lessons across three evidence gap areas (finance, entrepreneurship, and business model and products), intervention approaches, and enabling or challenging factors for attaining scale. We identified 13 interventions for in-depth study and distilled those lessons to inform the Framework design. This Annex describes the approach and methodology we followed in selecting the interventions.

SOURCE SELECTION

The 13 interventions we selected for in-depth analysis were based on our comprehensive review of 1,253 sanitation interventions around the world. These interventions were identified from select databases of sanitation interventions maintained by funders and aggregators of interventions in the sanitation space (identified in consultation with experts). In addition, we also received recommendations from an expert. In all, the following sources were used.

- United States Agency for International Development’s projects
- Sustainable Sanitation Alliance
- The Bill & Melinda Gates Foundation’s Grants Database
- GIZ
- WASHFunders (excluding The Bill & Melinda Gates Foundation)
- SanMark
- World Bank Sanitation projects
- Department for International Development

RETENTION STRATEGY

We scanned intervention titles within these databases and retained interventions based on the following criteria.

- **Interventions that focused on sanitation.** For our review, we defined sanitation interventions as those that included (but were not necessarily limited to) provision of a toilet interface.
- **Interventions that were *prima facie* market-based.** Market-based solutions were defined as solutions where the user made a full or partial monetary contribution for a toilet (build, buy, upgrade, or maintain) in cash. This included solutions that offer pay-per-use, rental, or installment payment options. At this stage, we did not screen for the type of suppliers—e.g., from the private sector, NGOs, or contractors to government or donor programs.
- **Interventions that were not pure research grants/grants to other funders.** Research projects and grants given to other funders were not included because they were not considered to be market-based.

We refined the list further in the following ways.

- **Consolidating duplicates:** Where an intervention was present in more than one database, we retained one entry and deleted the duplicates from the Excel template. For instance, a number of interventions in the BMGF database were also present in the SuSanA database.
- **Consolidating multi-phase interventions:** We consolidated interventions with multiple phases or extensions in one entry and reported the cumulative scale data. If the intervention strategy/approach changed across phases, however, we maintained separate entries.
- **Removing interventions without scale data:** We conducted a second review of those interventions for which we had not found scale data while preparing the long list. Where data was still not available, we removed the intervention from the long list. This included, for example, new interventions for which a progress report or a monitoring and evaluation report had not yet been prepared.

Through this process, we refined the 1,253 reviewed interventions to 107 interventions.

Table 2.1: Reviewed and retained interventions

Source	Reviewed	Retained
USAID	170	8
SuSanA	188	12
BMGF Grants	374	7
GIZ	34	1
WASHFunders (ex-BMGF)	56	11
SanMark	40	16
World Bank	271	44
DFID	119	7
Recommended by experts	1	1
Total	1,253	107

INTERVENTION FINALIZATION

The primary criteria for shortlisting an intervention was the intervention’s scale of impact. In consultation with experts, we determined that only interventions that affected at least 50,000 people (or 10,000 households²³), would be appropriate. Since the reported scale metrics varied by intervention, we standardized the scale to rank interventions (from highest to lowest degree of scale) to facilitate shortlisting. The standard scale we used was population affected (as reported), or five times the reported number of households/toilets sold (assuming five members per household or one toilet per household). For multi-country interventions, expert inputs were sought to identify specific countries to be studied in these multi-country interventions.

Thus, from the refined list of 107 interventions, we created three annexes.

- Annex I: Contained single-country interventions that affected 50,000 people (10,000 households). This contained 44 interventions.
- Annex II: Contained single-country interventions that affected fewer than 50,000 people (10,000 households). This contained 52 interventions.

²³ Based on the broader data for the countries studied the average household size was taken to be 5 members per household

- Annex III: Contained 11 multi-country interventions implemented across 43 countries.

From the 44 interventions at scale (Annex I), we shortlisted an additional 14 by applying selection criteria focused on the following.

- **Level of market activity/capacity:** We applied an additional filter that looked for interventions that not only had consumer contribution toward toilet cost, but also promoted private sector supply (toilets, material, or labor by local entrepreneur or businesses) as we considered these interventions to have a higher level of market activity/capacity. We assessed interventions to determine the role played by the government (as demand generator, supplier, and market facilitator), the level and type of subsidies provided, and the nature of actors involved in supplying sanitary products. We prioritized interventions where the government did not play a supplier role, where subsidies were either small/non-existent or well-targeted, and where the private sector supplied sanitation products.
- **Geographic focus (rural, urban, or both):** Because the dynamics of rural sanitation are very different from urban sanitation, we categorized rural and urban interventions separately. We gave preference to rural interventions.
- **Scale of impact:** As we did earlier, we gave priority to interventions that benefited the greatest number of people. To do so, we re-checked the scale metric.

While scale was the primary criteria, we also consulted experts to identify interventions that may not have reached as many people as others, but from which significant lessons could be learned. In addition, we applied other non-scale criteria such as the number of evidence gap areas that an intervention covered (giving preference to those that covered more than one area, or had a unique approach to any particular one area), and whether or not the intervention was in a challenging geography (difficult terrain or hard-to-reach customers). Therefore, from the 52 interventions that were not at scale (Annex II), we shortlisted one. Further, experts recommended four country-specific interventions from Annex III (list of multi-country interventions) and four additional interventions not covered through our database review. In total, we shortlisted 23 interventions, as Figure 2.1 shows.

We conducted rapid research on these 23 interventions to further finalize the 13 interventions for in-depth study. The final assessment was conducted based on the following characteristics.

- **Replicability:** We gave preference to interventions with the potential for replicability. We considered interventions replicable if there was a low cost per unit of toilets and if there were limited unique contextual elements that prevented replicability, such as dependence on strong institutions or unique actors. For example, interventions in Bangladesh that involved BRAC and in Vietnam that involved Vietnam Women's Union (VWU) were dropped despite the large scale of impact, because we judged that these were unique organizations whose reach and operations are difficult to find or replicate in other areas.
- **Sustainability:** We gave preference to interventions where market activity had been sustained, or was likely to remain, even after the intervention. These were interventions that had limited demand-side risks (e.g., dependence on high subsidies for purchase, low post-sales usage) and supply-side risks to sustainability (e.g., unprofitable business model, entrepreneurs exiting the sector).
- **Data availability:** We gave preference to interventions where credible intervention data was available and/or where people involved in the intervention were accessible for expert interviews.

Further, to better observe different applications of MBS where contextual factors were varied, we selected the 13 interventions for diversity in geography and themes (scale, significant lessons, and challenging geography). Therefore, interventions were chosen from the following three categories.

- Interventions that have scaled to more than 10,000 households or 50,000 people.
- Interventions that can provide significant lessons on the evidence gap areas even though they have not met scale criteria.
- Interventions implemented in challenging geographies.

Figure 2.1: Shortlisting process for intervention selection

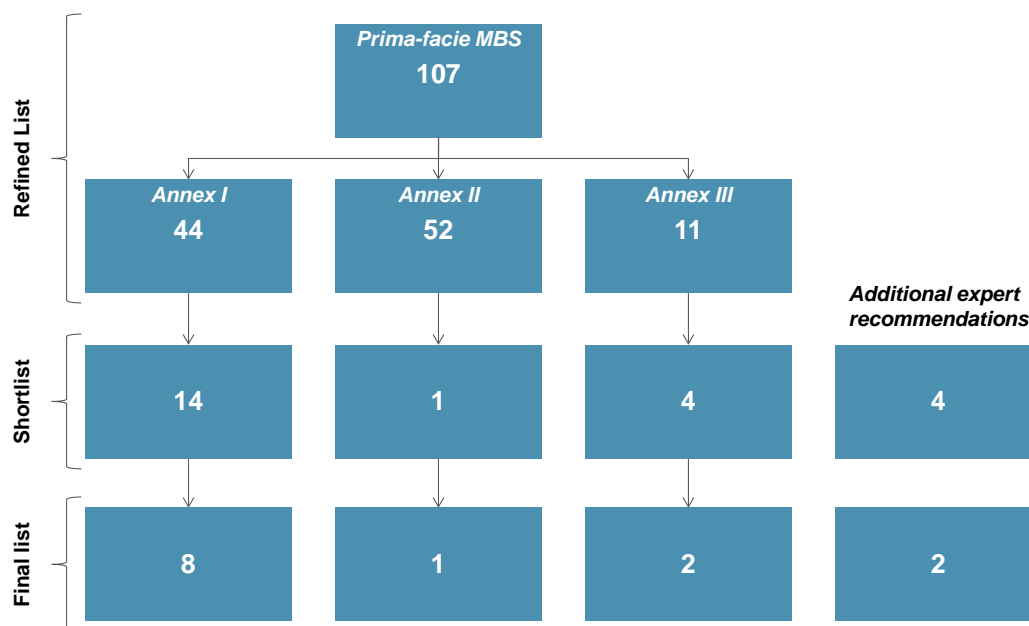


Table 2.2 shows the distribution of the final list of 13 interventions across these three categories.

Table 2.2: Final interventions studied

Theme	Country	Intervention
Interventions that have scaled to more than 10,000 households	Cambodia	Hands-off Sanitation Marketing (WaterSHED)
		Sanitation Marketing Scale Up (iDE)
		Community Hygiene Output-based Aid (CHOBA)
	Indonesia	Indonesia Urban Water, Sanitation, and Hygiene Project (IUWASH)
	India	Supporting Sustainable Sanitation Improvement (3Si)
	Malawi	Water for People “Everyone Forever”
Interventions that can provide significant lessons on one or more evidence gap areas	Tanzania	Rural Water Supply Programme (RWSP)
		Total Sanitation and Sanitation Marketing (TSSM) as context for RWSP
	Nigeria	Sustainable Total Sanitation (WaterAid)
Interventions implemented in challenging geographies (difficult terrain or hard-to-reach customers)	Ghana	Results Based Financing for Sanitation and Hygiene
	Benin	Promotion de l’hygiene et de l’assainissement
	Peru	Creating Sanitation Markets

CASE-STUDY RESEARCH

Intervention case studies were based on both desk research and expert interviews (primary research). Desk research focused on identifying key project documents, as well as further research papers and secondary literature focusing on each intervention. Expert interviewees included individuals involved in the intervention at an implementation level (e.g., program managers), individuals who were involved in defining the strategy/direction of the intervention (e.g., funders, country managers), and authors of secondary literature (individuals who studied the intervention).

A research approach was developed that focused on understanding the context of an intervention, identifying the problem(s) that the intervention was trying to solve (linked to the three evidence gap areas), and determining how the intervention addressed those problems. We identified key intervention elements (either those that were a part of the intervention design, those that emerged during implementation, or those that were identified in hindsight) and analyzed them in terms of the key problem they were trying to solve, how they addressed the problem, the enabling conditions/challenges faced in implementing the elements, and the factors that led to their success/failure. This analysis enabled us to identify key findings across elements and draw lessons from them.

We used this approach for all 13 cases, but the intensity and focus of the research depended upon the nature of the case. As Table 2.2 shows, more than one intervention took place in both Cambodia and Tanzania, while the other countries we considered had only one intervention each. Given the possibility that the multiple interventions in a single country may have interacted and influenced each other, we decided that researching these cases required a greater emphasis on country context than the single country cases did. We further segregated the single country cases into those that had interesting lessons across more than one evidence gap area and those that had an interesting lesson on a specific evidence gap area; again, we followed a different approach for the latter category. The three types of cases and the approach followed for each is described below.

- **Block 1 cases (multiple interventions in a single country):** Interventions from Cambodia and Tanzania fell into this category. Research for interventions in this category placed a higher emphasis on context, in addition to lessons from key elements, since it was important to focus on context to gauge whether any interaction occurred between the interventions in addition to understanding key elements.
- **Block 2 (single country interventions that focus on more than one evidence gap area):** Interventions from Benin, India, Nigeria, and Peru fell into this category. For these cases, we extracted lessons from key elements but there was relatively lighter research on context as compared to Block 1 cases.
- **Caselets (single country interventions that focus on one particular evidence gap area):** Interventions from Indonesia, Ghana, Malawi, and Mozambique fell into this category. Research for caselets involved a narrower focus on a specific element from the intervention or evidence gap addressed to support or supplement findings emerging from Block 1 or Block 2 cases.

FRAMEWORK DEVELOPMENT PROCESS

We analyzed findings from all 13 cases and identified common lessons about what works and what does not across the three evidence gap areas. These lessons, in conjunction with insights from the literature review, allowed us to develop a framework focused on key guiding principles for how to scale MBS solutions in a given context.

ANNEX 3: INTERVENTION ANALYSIS

We carried out two sets of analysis on the shortlist of 23 interventions described in Annex 2: 1) number of toilets compared to intervention expenses per toilet; and 2) number of toilets sold compared to the duration in which they were sold. We conducted these analyses for 10 out of the shortlist of 23 interventions where data was provided by implementers or was publicly available. This annex provides the data, notes, and sources for the analyses conducted. (Refer to Table 3.1) Where intervention expenses per toilet were reported, we used that figure in the analysis; in other cases, we calculated the intervention expenses per toilet based on the toilets sold and the total reported intervention budget.

For Analysis 1 (number of toilets compared to intervention expenses per toilet), we calculated the intervention expenses per toilet as the total sanitation budget divided by the total number of toilets sold, unless reported separately by the implementer. For Analysis 2, the duration refers to the period between the start of the program and the year in which the latest data on toilets sold is available. For both analyses, we calculated the number of toilets by dividing the population affected by household size (assumed to be five, except where mentioned specifically). We assumed that the number of toilets equals the number of households affected. In some cases, implementers directly reported the number of toilets sold.

Table 3.1: Data and sources for intervention analyses

Intervention	Number of toilets (#)	Total sanitation budget (USD)	Intervention expenses per toilet (USD)	Duration (# of years)	Source
Sanitation Marketing Scale Up (SMSU) Project, Cambodia	228,000 ¹	9,643,000	<i>Calculated</i>	6.3	Wei, Yi, et al., 2016; iDE, 2016
Total Sanitation and Sanitation Marketing (TSSM), Indonesia	215,856 ²	2,989,000	<i>Calculated</i>	4	Mathematica Policy Research, 2011
Supporting Sustainable Sanitation Improvement (3Si), India	193,411 ³	8,700,000	<i>Calculated</i>	6	SuSanA/PSI Webinar, PSI Impact Website
Hands-Off Sanitation Marketing Program, Cambodia	175,000 ⁴	3,758,285	<i>Calculated</i>	7	WaterSHED interview
Community Hygiene Output-Based Aid (CHOBA), Vietnam	113,500 ⁵	10,900,000 (for both Cambodia and Vietnam)	47	4	CHOBA Project Completion Report, 2016
Community Hygiene Output-Based Aid (CHOBA), Cambodia	50,500 ⁶		41	3	Thrive Networks, 2016; Interview
Rural Water Supply and Sanitation Project, Nepal	45,739 ⁷	1,010,000 ⁶	<i>Calculated</i>	8	World Bank, 2004
Rural Water Supply and	42,640 ⁸	3,970,000	<i>Calculated</i>	6	World Bank, 2017

Intervention	Number of toilets (#)	Total sanitation budget (USD)	Intervention expenses per toilet (USD)	Duration (# of years)	Source
Sanitation Project, Bangladesh					
Results Based Financing for Sanitation and Hygiene, Ghana	18,073 ⁹	2,850,000	<i>Calculated</i>	4	SNV Website
Total Sanitation and Sanitation Marketing (TSSM), Tanzania	16,107 ¹⁰	2,700,000	<i>Calculated</i>	4	Belete Muluneh, (2010), WSP Video, Momanyi, (2013)
Creating Sanitation Markets, Peru	9,000	0 ¹¹	<i>Calculated</i>	4	WSP, 2011

Notes: *Calculated* refers to computation of expenses per toilet based on toilets sold and intervention expense; in other instances, the intervention expense per toilet was available even though total budgets were not.

1. Data for the period December 2009 to March 2016 (toilets sold by December 2017 were approximately 270,000 but corresponding cost figures for the period are unavailable);

2. Data as of 2010;

3. Data as of Q2 2017;

4. Data as of 2017;

5. Data as of June 2016;

6. Data as of December 2015;

7. Cost per toilet may be higher since the budget figure used in this calculation does not include costs of raising sanitation awareness; Data as of 2003;

8. Data as of March 2017;

9. Data as of 2016;

10. Data as of 2011;

11. Cost per toilet is zero since companies in the project invested money on their own, without any external funding.

ANNEX 4: ACKNOWLEDGEMENTS

For their invaluable contribution to our research, we would like to thank the following persons:

Ada Oko-Williams, WaterAid

Ajith Kumar, Ex-World Bank

Alifah Lestari, Ex-Development Alternatives Incorporated

Andrés Hueso, WaterAid

Anyitike Mwakita, Ministry of Health, Government of Tanzania

Aprajita Singh, PSI

Bikas Sinha, PSI

Carel De Groot, Dutch Aid

Cecilia Rosell, Peruvian Industry Association (SNI)

Carolien van der Voorden, WSSCC

Clarissa Brocklehurst, Independent Consultant

Danielle Pedi, Bill & Melinda Gates Foundation

Eduardo Perez, University of Colorado Boulder

Elisa Roma, BMJ

Gabriel Kpinston, Independent Consultant

Geoff Revell, WaterSHED

Georgia Davis, East Meets West

Guy Clegbaza, GIZ

Hanh Nguyen, East Meets West

Hannah Taukobong, Iris Group, Inc.

Hengly Aun, WaterSHED

Ika Francisca, Development Alternatives Incorporated

Jacqueline Devine, Ex-World Bank

Jan Willem Rosenboom, Bill & Melinda Gates Foundation

Jason Cardosi, Ex-WSP

Jeff Albert, Aquaya, WASHPaLS, and former manager of the CHOBA program (2015-2016).

Jennifer Foster, PATH

Joe Brown, Georgia Institute of Technology

John Sauer, PSI

Jules Hountondji, PSI

Julia Rosenbaum, fhi360

Kaposo Mwambuli, Ex-WSP

Kyla Smith, WaterAid

Laura Abramovsky, Institute for Fiscal Studies

Lina Damayanti, Development Alternatives Incorporated

Louis Boorstin, Osprey Foundation

Louis O'Brien, Development Alternatives Incorporated

Lyn McLennan, WaterSHED

Malva Rosa Baskovich, World Bank

Mercedes Zevallos, Conaccion SAC

Michael Gnilo, UNICEF

Michael Roberts, iDE

Michiel Smet, Dutch Aid

Mike Rios, I7triggers

Mimi Jenkins, University of California Davis, ex-WaterSHED Asia GDA Sanitation Lead

Nat Paynter, Safe Water Network; Ex-World Bank

Nilanjan Chaudhury, Friends of Women`s
World Banking

Nneka Akwunwa, WaterAid

Pat Lennon, PATH

Peter Feldman, WaterAid

Pritpal Marjara, PSI

Rachel Peletz, Aquaya

Raman Shyam Singh, Sahyog Development
Services (SDS) Microfinance

Rita Ambadire, Netherlands Development
Organization (SNV)

Sandy Cairncross, London School of Hygiene
& Tropical Medicine

Sanjay Singh, PSI

Sarah Hedley, Stone Family Foundation

Satya Prakash Choubey, Ex-PSI

Shankar Narayanan, PSI

Towera Jalakasi, Tools for Enterprise &
Education Consultants

Trigeany Linggoatmodjo, USAID

Yi Wei, iDE

ANNEX 5: REFERENCES CITED IN THIS DESK REVIEW

The desk review and development of the framework builds upon a long history of research, experiences, and perspectives of leading experts in the field of sanitation, notably Sandy Cairncross, Eddy Perez, Jacqueline Devine, Mimi Jenkins, Danielle Pedi and Sophie Trémolet. Below, we list the references cited in the desk review including a selection of literature, which has shaped our thinking and is recommended as resources for those keen to develop a deeper understanding of market-based sanitation.

Some of the references listed below were sourced for the literature survey and also appear in Annex 6. Other references that appear only in this Annex were sourced specifically to supplement the intervention case study research.

Ahmed, Moiez, and Anna Hrybyk. 2016. "A Review of Shelter/WASH Delivery Methods in Post-Disaster Recovery Interventions." Catholic Relief Services.

Balcazar, Cecilia, Malva Rosa Baskovich, and Iana Málaga. 2015. "Saneamiento - Un Negocio Redondo." WSP.

Black, Maggie, and Ben Fawcett. 2008. "The Last Taboo: Opening the Door on the Global Sanitation Crisis." Earthscan Publications Ltd.

Brandberg, Bjorn. 1997. Latrine Building: A Handbook for Implementation of the SanPlat System. Intermediate Technology Publications.

Brandberg, Bjorn. 1991. "The SanPlat System: Lowest Cost Environmental Sanitation for Low Income Communities Based on Experiences from Mozambique, Malawi and Angola." SBI Consulting.

Cairncross, Sandy. 1992. "Sanitation and Water Supply: Practical Lessons from the Decade." World Bank.

Cairncross, Sandy. 2004. "The Case for Marketing Sanitation." WSP.

Clarke, Nikki. 2009. "Budgeting for the Upturn - Does Share of Voice Matter." Nielson Insights. 2009. <http://www.nielson.com/us/en/insights/news/2009/budgeting-for-the-upturn-does-share-of-voice-matter.html>.

Codja, Fébronie, Mina Saïdi, and Yannick Pradelles. 2009. "Rapport Synthèse Capitalisation PHA."

Devine, Jacqueline. 2009. "Introducing SaniFOAM: A Framework to Analyze Sanitation Behaviors to Design Effective Sanitation Programs." WSP.

Drolet, Adam. 2015. "Developing the Rapido Latrine in Rural Bihar, India." PATH.

East Meets West Foundation. 2016. "Community Hygiene Output-Based Aid (CHOBA): Project Completion Report."

Emerging Markets Consulting. 2014. "Study on the Experiences of Existing MFI Models Financing Sanitation in Rural Cambodia."

Emisen, Jude, Mimi Ishan, Ziyok Ishaku, Kole Adegbite, Janet Ngene, Rita Enugu, Ifaenyi, et al. 2014. "STS Nigeria Sustainable Total Sanitation Deep Dive Report." WaterAid.

Evans, Barbara, and Sophie Trémolet. 2009. "Targeting the Poor – Facilities and Improved Services." In

KfW Water Symposium. Frankfurt, Germany.

Frias, Jaime, and Nilanjana Mukherjee. 2005. "Harnessing Market Power for Rural Sanitation: Private Sector Sanitation Delivery in Vietnam." WSP.

Guiteras, Raymond, James Levinsohn, and Ahmed Mushfiq Mobarak. 2015. "Encouraging Sanitation Investment in the Developing World: A Cluster-Randomized Trial." *Science* 348 (6237): 903–6. <https://doi.org/10.1126/science.aaa0491>.

Heim, John J. 2009. "Determinants of Demand for Different Types of Investment Goods." 902. Rensselaer Working Papers in Economics. New York, USA.

Koh, Harvey, Samantha King, Ahmed Irfan, Rishi Agarwal, Ashvin Dayal, and Anna Brown. 2017. "Shaping Inclusive Markets." FSG.

Kwolek, Michael. 2012. "Sanitation Finance Access to Capital for Entrepreneurs and End-Users."

Mehta, Meera, and Andreas Knapp. 2004. "The Challenge of Financing Sanitation for Meeting the Millennium Development Goals." In 12th Session of the United Nations Commission on Sustainable Development. New York, USA.

Monitor Deloitte. 2012. "Supporting Sustainable Sanitation Improvements in Bihar through Supply-Side Strengthening: Customer Behavior." Monitor Deloitte.

Narayanan, Shankar. 2015. "Learning from Bihar, India: An Evolutionary Process and the Impact of a Market Development Program to Create a Functioning Sanitation Market." In UNC Water & Health Conference. Chapel Hill, NC.

Nicoletti, C, Yi Wei, and Stu Taylor. 2016. "An Approach to Measurement of the Sustainability of Sanitation Marketing WASH Programs." In 39th WEDC International Conference. Kumasi, Ghana.

Pedi, Danielle, and Marion W. Jenkins. 2013. "Enabling Environment: What Roles and Functions Are Needed in the New Sanitation Market?" UNICEF.

Pedi, Danielle, Phyrum Kov, and Susanna Smets. 2012. "Sanitation Marketing Lessons from Cambodia: A Market-Based Approach to Delivering Sanitation." WSP.

Pedi, Danielle, Mel Sophanna, Pouv Sophea, and Marion W. Jenkins. 2014. "Rural Consumer Sanitation Adoption Study." WaterSHED.

Preskill, Hallie, and Srik Gopal. 2014. "Evaluating Complexity: Propositions for Improving Practice." FSG.

PSI India. 2017. "Developing Markets for Sanitation: Where to Start?" SuSanA & BEAM Exchange. 2017. <https://www.youtube.com/watch?v=ReZTD8XCOGU&feature=youtu.be>.

Rios, Mike, and Marion W. Jenkins. 2013. "Demand Promotion and Marketing: How Do We Reach Rural Target Markets in Sanitation Marketing." UNICEF.

Rivera, R., G. Joseph, Susanna Smets, Virak Chan, Per Ljung, S. Um, Hong Hanh Nguyen, and Jeff Albert. 2016. "The Effect of OBA Subsidies Combined with Sanitation Marketing (SanMark) on Latrine Uptake among Rural Populations in Cambodia." East Meets West Foundation; WSP.

Roberts, Michael, Aaron Tanner, and Andrew McNaughton. 2007. "Demand Assessment for Sanitary Latrines in Rural and Urban Areas of Cambodia." WSP.

Robinson, Andy. 2011. "Enabling Environment Endline Assessment: Tanzania." WSP.

- Rosenboom, Jan Willem, Cordell Jacks, Phyrum Kov, Michael Roberts, and Tamara Baker. 2011. "Sanitation Marketing in Cambodia." *Waterlines* 30 (1): 21–40. <https://doi.org/10.3362/1756-3488.2011.003>.
- Rosensweig, Fred, Eduardo Perez, and Andy Robinson. 2012. "Policy and Sector Reform to Accelerate Access to Improved Rural Sanitation." WSP.
- Salter, Dan. 2008. "Sanitation Demand and Supply in Cambodia." WSP.
- Sanergy. n.d. "Sanergy Receives Growth Investment from Consortium of Investors Including Eleos, Acumen Fund, and SpringHill Equity Partners." Accessed July 27, 2017. <http://www.sanergy/archives/2524>.
- Sy, Jemima, and Robert Warner. 2014. "Tapping the Markets: Opportunities for Domestic Investments in Water and Sanitation for the Poor. Directions in Development." Washington DC: World Bank. <https://doi.org/10.1596/978-1-4648-0134-1>.
- Trémolet, Sophie. 2011. "Scaling Up Rural Sanitation: Identifying the Potential for Results-Based Financing for Sanitation." WSP.
- Trémolet, Sophie, Pete Kolsky, and Eduardo Perez. 2010. "Financing On-Site Sanitation for the Poor: A Six Country Comparative Review and Analysis." WSP.
- USAID. 2018. "Adaptive Management." Discussion Note. Washington DC: USAID.
- Visionfund Cambodia. n.d. "WaterSHED - VisionFund Cambodia." Accessed March 31, 2018. <http://www.visionfund.com.kh/watershed>.
- Wei, Yi, Tamara Baker, Michael Roberts, Stu Taylor, and Veasna Toe. 2014. "Sanitation Marketing Scale-Up (SMSU 1.0) - End of Project Report." iDE.
- WHO/UNICEF. 2015. "Progress on Sanitation and Drinking Water - 2015 Update and MDG Assessment." <https://doi.org/10.1007/s13398-014-0173-7.2>.
- World Bank. 2014. "Results Based Financing for Sanitation and Hygiene (PI44476) Implementation Status & Results Report."

ANNEX 6: REFERENCES INCLUDED IN THE FULL LITERATURE SURVEY

A Segtnan Industrial Design, and GIZ. 2010. "Toilet Pot for Slum Areas Industrial Design Research, Sketches and Conclusions."

Adhikari, Rajesh Upadhyay, and Bhushan Tuladhar. 2012. "Operation and Maintenance Challenges to Promote Dry Toilet: A Case of ENPHO EcoSan Implementing Area in Nepal." In 4th International Dry Toilet Conference.

Ahmed, Moiez, and Anna Hrybyk. 2016. "A Review of Shelter/WASH Delivery Methods in Post-Disaster Recovery Interventions." Catholic Relief Services.

Aidenvironment. 2009. "Appropriate Technology for Water and Sanitation: A Business Development Toolkit."

Akudago, J., K Holmberg, and L Sarmiento. 2016. "Strengthening Demand, Supply and Enabling Environment for Sanitation in the Philippines." In 39th WEDC International Conference. Kumasi, Ghana.

AMCOW, African Development Bank, WSP, EU Water Initiative, and UNDP. n.d. "Getting Africa on Track to Meet the MDGs on Water and Sanitation - A Status Overview of Sixteen African Countries."

AMCOW, African Development Bank, WSP, UNICEF, and World Bank. 2015. "Water Supply and Sanitation in the Democratic Republic of Congo: Turning Finance into Services for 2015 and Beyond."

AMCOW, African Development Bank, WSP, UNICEF, and World Bank. 2011. "Water Supply and Sanitation in Kenya: Turning Finance into Services for 2015 and Beyond." WSP.

AMCOW, African Development Bank, WSP, UNICEF, and World Bank. 2011. "Water Supply and Sanitation in Sierra Leone: Turning Finance into Services for 2015 and Beyond." WSP.

AMCOW, African Development Bank, WSP, UNICEF, and World Bank. 2009. "Water Supply and Sanitation in Tanzania: Turning Finance into Services for 2015 and Beyond." WSP.

AMCOW, African Development Bank, WSP, UNICEF, and World Bank. 2015. "Water Supply and Sanitation in Burkina Faso Turning Finance into Services for 2015 and Beyond."

AMCOW, African Development Bank, WSP, UNICEF, and World Bank. 2011. "Water Supply and Sanitation in Rwanda: Turning Finance into Services for 2015 and Beyond." WSP.

AMCOW, African Development Bank, WSP, UNICEF, and World Bank. 2015. "Water Supply and Sanitation in Angola Turning Finance into Services for 2015 and Beyond."

Amelink, Catherine, Craig Kullmann, Eduardo Perez, Nat Paynter, Ajith Kumar, Upneet Singh, Ousseynou Diop, et al. 2009. "Global Scaling Up Sanitation Project Second Annual Progress Report Indonesia, Tanzania and the States of Himachal Pradesh and Madhya Pradesh, India."

Amin, Samia, Anu Rangarajan, and Evan Bokrum. 2011. "Improving Sanitation at Scale: Lessons from TSSM Implementation in East Java, Indonesia." Mathematica Policy Research.

Amnesty International. 2011. "Facilitation Manual Sanitation Entrepreneur Training."

- Anders, Dieter. 2014. "Sanitation Activities in Uganda." GIZ.
- Annamraju, S, Belinda Calaguas, and Eric Gutierrez. 2001. "Financing Water and Sanitation: Key Issues in Increasing Resources to the Sector." WaterAid.
- Aubrey, Dyfed. 2009. "Community- Based Sanitation Entrepreneurship in Mukuru and Korogocho Informal Settlements, Nairobi." In 34th WEDC International Conference. Addis Ababa, Ethiopia.
- Auerbach, D. 2015. "Financing Sanitation." Sustainable Sanitation Practice, no. 24.
- Awan, D, M Miankhel, and R Kanaganathan. 2015. "Replicating the Sanitation Marketing Model of the Low Cost Product 'Easy Latrine' in Sindh Province, South Pakistan." In 38th WEDC International Conference. Loughborough, UK.
- Awaisghe, Francis Eremutha, Hamed B. Taiwo, and Mynepalli K. C. Sridhar. 2015. "A Novel Dry Toilet Complex Design for a Market Community in Nigeria with Diverse Cultural Practices." In 5th International Dry Toilet Conference.
- Ayee, Joseph, and Richard Crook. 2003. "'Toilet Wars': Urban Sanitation Services and the Politics of Public-Private Partnerships in Ghana."
- Ayling, Sophie. 2012. "The Business of Sanitation – Taking Toilets to Scale." Business Fights Poverty. 2012. <http://businessfightspoverty.org/articles/the-business-of-sanitation-taking-toilets-to-scale/>.
- Baetings, Erick. 2012. "Report on the 2012 3rd Quarterly Meeting of SHAW Programme Coordinators." IRC International Water and Sanitation Centre.
- Baetings, Erick. 2014. "Report on SNV Bhutan SSH4A Baseline Preparations Workshop, 20 to 22 May 2014, Thimphu, Bhutan." SNV; IRC International Water and Sanitation Centre.
- Baetings, Erick. 2016. "Sanitation Market Research in Rural Cambodia: Rapid Assessment of Supply and Demand in Three Rural Districts." IRC International Water and Sanitation Centre.
- Baetings, Erick, S Farhat Ubaid, and R Haque. 2014. "Sanitation Demand and Supply in Rural Bangladesh: Rapid Assessment to Identify Supply Chain Challenges." BRAC; IRC.
- Balcazar, Cecilia, Malva Rosa Baskovich, and Iana Málaga. 2015. "Saneamiento - Un Negocio Redondo." WSP.
- Baldi, Shrikant, Ajith Kumar, Nilanjana Mukherjee, Nat Paynter, Eduardo Perez, Craig Kullmann, and Singh. 2008. "Sustaining Sanitation Beyond Projects." WSP.
- Banzet, Julie. 2003. "Towards Child-Friendly Latrines in Vietnam." UNICEF.
- Barenberg, Andrew. 2009. "Microfinance for Water and Sanitation: A Case Study from Tiruchirappalli, India." In 34th WEDC International Conference. Addis Ababa, Ethiopia.
- Baskovich, Malva Rosa. 2011. "Sanitation Markets at the Bottom of the Pyramid A Win-Win Scenario for Government, the Private Sector, and Communities." WSP.
- Baskovich, Malva Rosa. 2011. "Domestic Private Sector Participation in Peru Sanitation Markets at the Bottom of the Pyramid." WSP.
- Baskovich, Malva Rosa. 2008. "Building Inclusive Sanitation Markets for the Poor." In IRC Symposium: Sanitation for the Urban Poor Partnerships and Governance. Delft, The Netherlands.

Bastable, Andy, and Lucy Russell. 2013. "Gap Analysis in Emergency Water, Sanitation and Hygiene Promotion." Oxfam.

Batz, Franz-Josef, Stephanie Lorek, Johannes Majewski, and Christopher Lassenberger. 2010. "Pro-Poor Financial Services for Rural Water: Linking the Water Sector to Rural Finance." GIZ.

Bauer, Stefanie. n.d. "Beyond Equity: Financial Innovation for Social Enterprise Financing." GIZ.

Baumann, Erich. 1993. "Private Sector Involvement." In 19th WEDC Conference, 203–6. Accra, Ghana.

Bawa, K, and E Bitrus. 2011. "The Mass Media as a Tool for Sanitation Marketing and Hygiene Promotion: A Case Study." In 35th WEDC International Conference. Loughborough, UK.

Behailu, Beshah M. 2015. "Dry Toilet Sanitation as an Alternative Solution to the Rural Ethiopia." In 5th International Dry Toilet Conference.

Bill and Melinda Gates Foundation. n.d. "BMGF: What We Do - Water, Sanitation & Hygiene: Strategy Overview." <https://www.gatesfoundation.org/What-We-Do/Global-Growth-and-Opportunity/Water-Sanitation-and-Hygiene>.

Bill and Melinda Gates Foundation. 2014. "Reinvent the Toilet Fair: India Exhibitors."

Bill and Melinda Gates Foundation. 2014. "Reinvent the Toilet Fair: India | Technical Guides."

Bill and Melinda Gates Foundation. 2012. "Rapid Technology Assessment for Omni-Processor Project."

Bird, Sandra, and Marcia Brown. 2009. "Best Practices and Lessons Learned from Sanitation Programming at USAID: An Annotated Bibliography." USAID.

Birner, Sabrina, Remke van Zadelhoff, and Bastiaan Mohrmann. 2011. "Bringing Water to Where It Is Needed Most: Innovative Private Sector Participation in Water & Sanitation." WSP.

Black, Maggie, and Ben Fawcett. 2008. "The Last Taboo: Opening the Door on the Global Sanitation Crisis." Earthscan Publications Ltd.

Blackett, Isabel. 1994. "Low Cost Urban Sanitation in Lesotho." World Bank.

Boorstin, Louis, Ashish Karamchandani, Jithamithra Thathachari, and Aroon Vijaykar. 2015. "Scaling Up Market-Based Approaches to Rural Sanitation in India Opportunities for Action and Strategic Recommendations." WSP.

BORDA. n.d. "City Selection: Methodology -Effect Document."

BORDA, and DEWATS. n.d. "AKSANSI Association of CBOs on Sanitation in Indonesia."

BRAC. 2013. "Identifying Sustainable Business Models for Rural Sanitation."

BRAC. 2011. "The Role of Rural Sanitation Centres in BRAC's WASH Programme."

BRAC. 2015. "Rapid Assessment of Sanitation Demand and Supply in Rural Bangladesh Recommendations for Strengthening the Supply Chain for Rural Sanitation and Supply."

BRAC. 2015. "BRAC WASH Learning from WASH Experiences in Bangladesh."

Brandberg, Bjorn. 1997. Latrine Building: A Handbook for Implementation of the SanPlat System. Intermediate Technology Publications.

Brandberg, Bjorn. 1991. "The SanPlat System: Lowest Cost Environmental Sanitation for Low Income Communities Based on Experiences from Mozambique, Malawi and Angola." SBI Consulting.

Brossard, Simon, Jessica Graf, Olivier Kayser, and Bernard Garrette. 2015. "Creating Alliances to Accelerate Commercially Viable Sanitation." Hystra.

Brueckner, Marina. n.d. "Establishing Sustainable Operation & Maintenance and Monitoring & Evaluation Schemes for Community Based Sanitation Infrastructure: Experiences from Indonesia." BORDA.

Bruijne, Gert de, Mirjam Geurts, and Brian Appleton. 2007. "Sanitation for All?" IRC International Water and Sanitation Centre.

Buckley, Chris, K.M. Foxon, N. Rodda, C.J. Brouckaert, S. Mantovanelli, and M. Mnguni. 2008. "Research into UD/VIDP (Urine Diversion Ventilated Improved Double Pit) Toilets: Physical and Health-Related Characteristics of UD/VIDP Vault Contents." Water Research Commission.

Busjeet, Gita. n.d. "Planning, Monitoring, and Evaluation: Methods and Tools for Poverty and Inequality Reduction Programs Poverty." World Bank.

Cabrera, Ricardo. 1995. "Review of Rural Water and Sanitation Project Evaluations in Latin America." IRC International Water and Sanitation Centre.

Cairncross, Sandy. 1992. "Sanitation and Water Supply: Practical Lessons from the Decade." World Bank.

Cairncross, Sandy. 2004. "The Case for Marketing Sanitation." WSP.

Canaday, Christopher, Elke Müllegger, Claudia Wendland, Stefan Deegener, Fedde Jorritsma, and Charles Thibodeau. 2011. "Sustainable Sanitation Practice: Toilets." Sustainable Sanitation Practice, no. 6: 32.

Canaday, Christopher, and Charles Thibodeau. 2011. "Elegant yet Economical Urine-Diverting Dry Toilets in Ecuador." Sustainable Sanitation Practice, no. 6.

Carr, Graham, and David Kane. 2003. "The Private Sector in Rural Water and Sanitation Services in Uganda: Understanding the Context and Developing Support Strategies." *Journal of International Development* 1099–1114 (15). <https://doi.org/10.1002/jid.1053>.

Castalia Strategic advisors. 2015. "Review of Results-Based Financing Schemes in WaSH."

Champetier, Severine, and Amadou Diallo. 2000. "Independent Water and Sanitation Providers in Africa: Case Study (Guinea)." WSP.

Chand, Chakra Bahadur, and Pamela White. 2015. "Productive Sanitation Successfully Links Toilets and Livelihoods."

Chapin, Jeff, and Danielle Pedi. 2013. "Sanitation Supply Chains and Business Models: How Can We Improve Market Systems?" UNICEF.

Chapin, Jeff, and Danielle Pedi. 2013. "Getting the Product and Service Right: How Do We Design Affordable, Desirable Latrines That Businesses Can Profitably Produce and Sell?" UNICEF.

Chase, Claire, Maria Quattri, Hanh Diem Nguyen, and Minh Thi Hien Nguyen. 2014. "Demand Creation and Supply Chain Development for Scaling Up Rural Sanitation in Hoa Binh Province: Assessment Report."

- Chatterley, Christie. 2014. "Strengthening Public Sector Enabling Environments to Support Sanitation Enterprises Based on Water For People's Experience in Nine Countries."
- Chatterley, Christie, Otto Gonzalez, David Sparkman, Steven Sugden, Kim Lemme, and Sue Dorsey. 2013. "Microfinance As a Potential Catalyst for Improved Sanitation." Water for people.
- Chongo, Noah, and C.O Kawanga. 2015. "Inclusive Stakeholder Participation for Sustaining Dry Sanitation Solution in Peri-Urban Areas: A Madimba Community Experience, Zambia." In 5th International Dry Toilet Conference.
- Clarke, Nikki. 2009. "Budgeting for the Upturn - Does Share of Voice Matter." Nielson Insights. 2009. <http://www.nielson.com/us/en/insights/news/2009/budgeting-for-the-upturn-does-share-of-voice-matter.html>.
- Clouet, Benjamin. 2011. "Combined Shower, Urine Diversion Dry Toilet and Drip Irrigation System: Design for Eco-Sanitation Marketing."
- Codja, Fébronie, Mina Saïdi, and Yannick Pradelles. 2009. "Rapport Synthèse Capitalisation PHA."
- Cole, Ben, John Pinfold, Goen Ho, and Martin Anda. 2014. "Exploring the Methodology of Participatory Design to Create Appropriate Sanitation Technologies in Rural Malawi." In 36th WEDC International Conference. Nakuru, Kenya.
- Cole, Ben, John Pinfold, Goen Ho, and Martin Anda. 2012. "Investigating the Dynamic Interactions between Supply and Demand for Rural Sanitation, Malawi." *Journal of Water, Sanitation and Hygiene for Development* 2 (4): 266–78. <https://doi.org/10.2166/washdev.2012.014>.
- Colin, Jenny. 2012. "Findings from Hygiene and Sanitation Financing Study in Lao PDR."
- Collignon, Bernard, and Marc Vézina. 2000. "Independent Water and Sanitation Providers in African Cities Full Report of a Ten-Country Study." WSP. <https://doi.org/10.1080/08927014.2011.639067>.
- Coombes, Yolande, William Davies, and Danielle Pedi. 2013. "Kenya Onsite Sanitation: Market Intelligence." WSP.
- Coombes, Yolande, William Davies, and Danielle Pedi. 2013. "Kenya Onsite Sanitation: Product and Business Model Design." WSP.
- Coombes, Yolande, William Davies, and Danielle Pedi. 2013. "Kenya Onsite Sanitation: Demand Generation Strategies." WSP.
- Cranston, Pete. n.d. "Knowledge Management and Building Demand for Sanitation." Euforic Services Ltd.
- Daalen, Tettje Van. 2016. "Become Effective, Efficient, and Then Scale up." IRC Newsletter. 2016. <https://www.ircwash.org/news/become-effective-efficient-and-then-scale-nine-years-brac-wash>.
- Dagerskog, Linus, Karim Savadogo, Kailou Hamadou, and Anselme Vodounhessi. 2015. "Productive Sanitation in Burkina Faso and Niger - Going beyond Projects?" In 5th International Dry Toilet Conference.
- Dauenhauer, K. 2015. "Synthesis Urban Sanitation Finance: From Macro to Micro Level Thematic Discussion." SuSanA Discussion Forum. Sustainable Sanitation Alliance (SuSanA).
- Dauenhauer, K. 2010. "Thematic Discussion: Private Sector Engagement in Sanitation and Hygiene: Exploring Roles across the Sanitation Chain." WSSCC.

Davies, A., and J. Tinsley. 2013. "WaterCredit: A Case Study of Microfinance for Household Water and Sanitation Improvements in India and Kenya." In 36th WEDC International Conference. Nakuru, Kenya.

Davies, William. 2013. "Selling Sanitation: Catalyzing the Market for Household Sanitation in East Africa." WSP.

Davis-Cole, John, and Beth Karanja. 1998. "Participatory Hygiene and Sanitation: Report on the Prospective Review of Participatory Methods with a Focus on PHAST." WSP.

Defere, Eyob. 2015. "Private Sector Landscape for WASH in Ethiopia." IRC International Water and Sanitation Centre.

Department: Water Affairs and Forestry. 2002. "Sanitation Technology Options." Government of South Africa.

Deshusses, Marc, and Kathy Joos. n.d. "Omni Processor for Fecal Waste." Duke University; University of Missouri.

Devine, Jacqueline. 2010. "Sanitation Marketing as an Emergent Application of Social Marketing: Experiences from East Java." Cases in Public Health and Communication & Marketing. Vol. 4.

Devine, Jacqueline. 2009. "Introducing SaniFOAM: A Framework to Analyze Sanitation Behaviors to Design Effective Sanitation Programs." WSP.

Devine, Jacqueline, and Craig Kullmann. 2011. "Scaling Up Rural Sanitation: Introductory Guide to Sanitation Marketing." WSP. <http://www.wsp.org/wsp/sites/wsp.org/files/publications/WSP-Introductory-Guide-Sanitation-Marketing.pdf>.

Devine, Jacqueline, and Craig Kullmann. 2011. "Introductory Guide to Sanitation Marketing Developing a Marketing Strategy." WSP.

Devine, Jacqueline, and Christine Sijbesma. 2011. "Sustainability of Rural Sanitation Marketing in Vietnam: Findings from a New Case Study." Waterlines. Vol. 30. <https://doi.org/10.3362/1756-3488.2011.005>.

DFID, and WSP. 2010. "Domestic Private Sector Participation: Uganda."

DFID, and WSP. 2010. "Domestic Private Sector Participation: Pakistan."

DFID, and WSP. 2010. "Domestic Private Sector Participation: Vietnam."

DFID, and WSP. 2010. "Domestic Private Sector Participation: Bangladesh."

Dietvorst, Cor. 2013. "Sanitation as a Business in Malawi - the Poor Will Have to Wait." IRC Newsletter. 2013.

Dietvorst, Cor. 2016. "Top Blog: The Importance of Communication 'amplifiers.'" IRC Newsletter. 2016.

Dietvorst, Cor. 2013. "Competition? I Am the Best." IRC Newsletter. 2013.

Dietvorst, Cor. 2016. "Indestructible and Smart: Public Toilet Innovation in India Subscribe Now." IRC Newsletter. 2016.

Dietvorst, Cor. 2013. "Bangladesh: A Field Tool for Sanitation Marketing Surveys." IRC Newsletter. 2013.

- Donahue, Paul, and Christian Zurbrügg. 2012. "Sandec News." Vol. 13. EAWAG.
- Drees-Gross, Franz, Luis Andrade, and Beatriz Schippner. 2005. "Delegating Water and Sanitation Services to Autonomous Operators." WSP.
- Drewko, Aleksandra. 2007. "Resource - Oriented Public Toilets in Developing Countries: Ideas, Design, and Operation and Maintenance for Arba Minch, Ethiopia." Technische Universität Hamburg-Harburg.
- Drolet, Adam. 2015. "Developing the Rapido Latrine in Rural Bihar, India." PATH.
- During, Juanita. 2011. "Just Building a Million Latrines Won't Solve Africa's Sanitation Crisis." The Guardian, January 21, 2011.
- Dutch WASH Alliance. n.d. "Local NGOs Promote Toilets and Hygiene for Better Health."
- Eales, Kathy, and David Schaub-Jones. 2005. "Sanitation Partnerships: Landlord or Tenant? The Importance of Rental Relationships to Poor Community Sanitation in 3 African Countries." BPD Water and Sanitation.
- East Meets West Foundation. 2016. "Community Hygiene Output-Based Aid (CHOBA): Project Completion Report."
- East Meets West Foundation. n.d. "Community Hygiene Output-Based Aid (CHOBA) Outcomes Investing Targets the Poor."
- East Meets West Foundation, and WSP. 2016. "Study to Measure Impact of Output-Based Aid and Sanitation Marketing on Sanitation Adoption in Cambodia."
- Ekane, Nelson. 2013. "Sanitation Policy and Practice in Rwanda: Tackling the Disconnect." Stockholm Environment Institute.
- Ekane, Nelson, Björn Nykvist, Marianne Kjellén, Stacey Noel, and Nina Weitz. 2014. "Multi-Level Sanitation Governance: Understanding and Overcoming Challenges in the Sanitation Sector in Sub-Saharan Africa." Stockholm Environment Institute. Vol. 4. <https://doi.org/10.3362/2046-1887.2014.024>.
- Emerging Markets Consulting. 2014. "Study on the Experiences of Existing MFI Models Financing Sanitation in Rural Cambodia."
- Emerging Markets Consulting. 2013. "Supply Chain Analysis for Rural Sanitation Products and Services for Lao PDR."
- Emisen, Jude, Mimi Ishan, Ziyok Ishaku, Kole Adegbite, Janet Ngene, Rita Enugu, Ifaenyi, et al. 2014. "STS Nigeria Sustainable Total Sanitation Deep Dive Report." WaterAid.
- Ennovent, IRC, and Taru. 2016. "Sanitation Innovation Accelerator - Enabling Rural Sanitation: Understanding the Business Perspective."
- Ensink, Jeroen, Belen Torondel, Steven Sugden, and Walter Gibson. n.d. "New Concepts for on-Site Sanitation Based on Bio- Additives and Pit Design." London School of Hygiene & Tropical Medicine.
- Etherington, Alan. n.d. "Preparing for Private Sector Management in Kathmandu." WaterAid.
- EU Water Initiative. 2011. "Financing for Water and Sanitation: A Primer for Practitioners and Students in Developing Countries."
- EU Water Initiative. 2012. "Small-Scale Finance for Water and Sanitation."

- Evans, Barbara, and Sophie Trémolet. 2009. "Targeting the Poor – Facilities and Improved Services." In KfW Water Symposium. Frankfurt, Germany.
- Fall, Abdoulaye, and Chiaka Coulibaly. 2011. "Urban Urine Diversion Dehydration Toilets and Reuse Ouagadougou, Burkina Faso - Draft." Sustainable Sanitation Alliance.
- Feki, Firas, N Weissenbacher, S Sayadi, and Günter Langergraber. 2013. "The Grey and Black Water Separation as Solution for Water Scarcity and Sanitation in MSBs in Arba Minch, Ethiopia." In IWA Development Congress. Nairobi, Kenya.
- Ferris, James, and Elizabeth Graddy. 2003. "Case Studies and Analysis of Service and Management Contracts in Developing Countries." Contracting Out Water and Sanitation Services. WEDC.
- Fioravanti, Marcos. n.d. "The Earth Auger - An Ecological Toilet: Mechanized and 100% Decentralized." Fundacion In Terris.
- Fonseca, Catarina, Marieke Adank, Deirdre Casella, Martine Jeths, Peter van der Linde, and Bianca Dijkshoorn. 2007. "Microfinance for Water, Sanitation and Hygiene: An Introduction." IRC International Water and Sanitation Centre.
- Fraja, Gianni De. 2011. "Public Funding for Sanitation - The Many Faces of Sanitation Subsidies." WSSCC.
- Franceys, Richard. 1997. "Private Sector Participation in the Water and Sanitation Sector: Private Waters? - A Bias Towards The Poor." DFID.
- Franceys, Richard, Chris Perry, and Catarina Fonseca. 2006. "African Development Bank: Guidelines for Water User Fees and Cost Recovery for Water, Sanitation and Irrigation Projects." IRC International Water and Sanitation Centre.
- Franceys, Richard, and Almud Weitz. 2003. "Private Sector Participation in Water Supply and Sanitation." Waterlines 21 (3).
- Francisco Chirruete, Guy Norman, and Sam Parker. 2011. "Financing Communal Toilets: The Tchemulane Project in Maputo Maputo Business Model More Details." WSUP.
- Frias, Jaime. 2008. "Opportunities to Improve Sanitation: Situation Assessment of Sanitation in Rural East Java, Indonesia." WSP.
- Frias, Jaime, and Nilanjana Mukherjee. 2005. "Harnessing Market Power for Rural Sanitation: Private Sector Sanitation Delivery in Vietnam." WSP.
- Frischmuth, Christiane. 2008. "Global Learning Strategy." WSP.
- Fröhlich, Urs. 1999. "Private Sector - Just a (New) Hope?" In 15th AGUASAN Workshop.
- Fruman, Yuliya, Claudia Wendland, Anna Samwel, and Stefan Deegener. 2012. "4th International Dry Toilet Conference Acceptance: Acceptance of UDDTs in Eastern Europe, Caucasus, and Central Asia."
- Fuertes, Patricia, Malva Rosa Baskovich, Mercedes Zevallos, and François Brikké. 2008. "The Private Sector and Sanitation for the Poor: A Promising Approach for Inclusive Markets in Peru." Waterlines 27 (4): 307–22. <https://doi.org/10.3362/1756-3488.2008.035>.
- Gabert, Julien. n.d. "How to Make Urban and Sanitation Planning Work." GRET.

- Galli, Giacomo, and Ashley Meek. 2016. "Facilitating Sanitation Governance in Small Town DRC." In 39th WEDC International Conference. Kumasi, Ghana.
- Galli, Giacomo, Christophe Nothomb, and Erick Baetings. 2014. "Towards Systemic Change in Urban Sanitation." IRC International Water and Sanitation Centre.
- Garvey, Gerry. 2003. "Water and Sanitation in Social Funds: A Rapid Assessment in Sub Saharan Africa." WSP.
- Gensch, Robert, Analiza Miso, Gina Itchon, and Elmer V. Sayre. 2010. "Low-Cost Sustainable Sanitation Solutions for Mindanao and the Philippines." Cagayan de Oro City, Philippines: Xavier University Press.
- Gero, Anna, Naomi Carrard, Janina Murta, and Juliet Willetts. 2014. "Private and Social Enterprise Roles in WASH for the Poor: A Systematic Review." *Journal of Water, Sanitation and Hygiene for Development* 4 (3): 331–45.
- Gero, Anna, and Juliet Willetts. 2014. "Incentives Shaping Enterprise Engagement in Vietnam." ISF-UTS.
- Gerryshom, Munala. n.d. "Socio-Cultural Influences and Management That Determine Sanitation Facilities Use in the Informal Settlements." Jomo Kenyatta University of Agriculture and Technology.
- Gibson, Walter, Adam Biran, Colin Sumpter, Helen Trevaskis, and Claire Furlong. 2012. "Final Summary Report of All Ideas, Prototypes Developed, Market Potential and Segmentation, and Routes to Commercialization Completed and Disseminated." London School of Hygiene and Tropical Medicine.
- Ginneken, Meike Van, Ross Tyler, and David Tagg. 2004. "Can the Principles of Franchising Be Used to Improve Water Supply and Sanitation Services? – A Preliminary Analysis." Water Supply and Sanitation Sector Board Discussion Paper Series, no. 2.
- GIZ. n.d. "GIZ's Experience in the Water and Sanitation Sector in Latin America."
- GIZ. 2013. "Promising Practices: On the Human Rights-Based Approach in German Development Cooperation Health: Ensuring Inclusion and Access to Quality Health Care in Kenya."
- GIZ. n.d. "Closing the Last Mile for Millions: Sharing the Experience on Scaling up Access to Safe Drinking Water and Adequate Sanitation to the Urban Poor."
- GIZ. 2009. "Evaluation Report on GTZ's Work - I Ith Cross-Section Analysis of Evaluations Conducted in 2008/2009."
- GIZ. n.d. "Solid Waste Management and Basic Sanitation."
- GIZ. n.d. "Corporate Strategy Evaluation on Scaling up and Broad Impact."
- GIZ. 2013. "2013 Annual Press Conference."
- Godfrey, Amaka, Teresa Hart, and Fred Rosensweig. 2010. "Application of Total Sanitation and Sanitation Marketing (TSSM) Approaches to USAID." USAID.
- Godfrey, Amaka, Lillian Mbeki, Magdalena Bäuerl, Andreas Knapp, WSSCC, and Sustainable Sanitation Alliance. 2015. "Private Sector Engagement in Sanitation and Hygiene: Exploring Roles across the Sanitation Chain." WSSCC.
- Goertler, Andrea. n.d. "Water Policy." GIZ.

- Golden, Jay S. 2013. "Sanitation in South Africa: A Preliminary Evaluation of Barriers & Opportunities." Duke University.
- Government of Zimbabwe. 1990. "The Development of Sustainable Financing Policies for Water and Sanitation Provision in Communal Lands & Resettlement Areas."
- Graf, Jessica, Olivier Kayser, and Simon Brossard. 2014. "Designing the next Generation of Sanitation Businesses: A Report by Hystra for the Toilet Board Coalition." Hystra. hystra.com/s/HystraSanitation_122pp_Web-sqkq.pdf.
- Graham, Roslyn. 2015. "Thematic Discussion Series: Synthesis of The Sanitation Ladder: Next Steps Thematic Discussion." Sustainable Sanitation Alliance.
- Gröber, Katharina, Carol McCreary, Leonie Kappauf, Thilo Panzerbieter, and Johannes Rück. 2012. "Public Awareness Raising and Sanitation Marketing." Sustainable Sanitation Alliance.
- Groeber, Katharina, David Crossweller, Enno Schröder, Annamaja Segtnan, and Christian Zurbrügg. 2012. "Sanitation as a Business." Sustainable Sanitation Alliance.
- Groeber, Katharina, David Crossweller, Enno Schröder, Annamaja Segtnan, Christian Zurbrügg, David Schaub-Jones, Katharina Groeber, et al. 2012. "Sanitation as a Business: Trends Shaping the Market for Urban Sanitation." Stockholm Environment Institute.
- Groth, Felix. 2005. "Ventilation of Dry Toilets Case Study: Close-Ups of Various Installations in Uganda." Fachhochschulstudiengänge Burgenland.
- GSF. 2012. "WSSCC, Global Sanitation Fund (GSF) Progress Report 2012."
- GSF. 2011. "Global Sanitation Fund Progress Report 2011."
- GSF. 2014. "Global Sanitation Fund: Progress Report 2014."
- GSF. 2013. "Global Sanitation Fund Progress Report 2013."
- Gugu, Faith. 2011. "Workshop Proceedings." In East Africa Practitioners Workshop on Pro Poor Urban Sanitation and Hygiene. Kigali, Rwanda.
- Guiteras, Raymond, James Levinsohn, and Ahmed Mushfiq Mobarak. 2015. "Encouraging Sanitation Investment in the Developing World: A Cluster-Randomized Trial." *Science* 348 (6237): 903–6. <https://doi.org/10.1126/science.aaa0491>.
- Guiteras, Raymond, Mobarak A Mushfiq, and Shyamal Chowdhury. n.d. "Does Sanitation Behavior Migrate?" In FSM3 Conference. Hanoi, Vietnam.
- Guoth-Gumberger, Rudi, and Marla Guoth-Gumberger. 1987. "Muruki Water and Sanitation Project, Small Projects' Training Manual." Sudan Council of Churches.
- Gutierrez, Eric, Belinda Calaguas, Joanne Green, and Virginia Roaf. 2003. "New Roles, New Rules - Does Private Sector Participation Benefit the Poor?" WaterAid.
- Hanchett, Suzanne, Laurie Krieger, Mohidul Hoque Kahn, Craig Kullmann, and Rokeya Ahmed. 2011. "Scaling Up Rural Sanitation Long-Term Sustainability of Improved Sanitation in Rural Bangladesh."
- Hannan, Carolyn, and Ingvar Andersson. 2002. "Gender Perspectives on Ecological Sanitation." *EcoSanRes*.

Hawkins, Peter. 2013. "The Biggest Leak in the Delivery Chain: Why We Need to Focus on Fecal Sludge Management." WSP.

Hawkins, Peter, Isabel Blackett, and Chris Heymans. 2013. "Targeting the Urban Poor and Improving Services in Small Towns. Urban Sanitation: An Overview." WSP.

Heierli, Urs, and Jaime Frias. 2007. "Total Sanitation as a Business and Community Action in Bangladesh and Elsewhere." SDC.

Heierli, Urs, Armon Hartmann, Francois Munger, and Pierre Walther. 2004. "Sanitation Is a Business: Approaches for Demand-Oriented Policies."

Heijnen, Marieke, Han Heijnen, and Marijn Zandee. 2012. "Promotion of Double-Pit Urine-Diversion Toilets, Sabaithuwa, Parsa District, Nepal - Draft." Sustainable Sanitation Alliance.

Heim, John J. 2009. "Determinants of Demand for Different Types of Investment Goods." 902. Rensselaer Working Papers in Economics. New York, USA.

Henry, Chuck. n.d. "A Mechanized, Pedal Operated Urine Diverting Dry Toilet." Fundacion In Terris.

Hetzer, Kajetan. 2015. "Targeting the Missing Middle – Impact Investment as a Tool to Finance Basic Needs Services." In Symposium BORDA: Integrated Management of Used-Water and Sanitation. Bremen, Germany.

Hutton, Guy, B. Larsen, L. Leebouapao, and S. Voladet. 2009. "Economic Impacts of Sanitation in Lao PDR: A Five-Country Study Conducted in Cambodia, Indonesia, Lao PDR, the Philippines, and Vietnam under the Economics of Sanitation Initiative (ESI)." WSP.

Hutton, Guy, UE. Rodriguez, L. Napitupulu, Pham Thang, and Phyrum Kov. 2008. "Economic Impacts of Sanitation in Southeast Asia." WSP. <https://doi.org/10.1193/1.1585864>.

ICBA International Centre for Biosaline Agriculture. 2014. "Highlights and Achievements FY13."

iDE. n.d. "Outsmarting Diarrheal Disease."

iDE. 2010. "'Easy Latrine' Wins International Design Competition." iDE Cambodia.

Idelovitch, Emanuel, and Klas Ringskog. 1995. "Private Sector Participation in Water Supply and Sanitation in Latin America." World Bank. <https://doi.org/10.1596/0-8213-3219-8>.

IDinsight. 2013. "Microfinance Loans to Increase Sanitary Latrine Sales."

IFC. 2015. "Leveraging Market Opportunities to Achieve Development Impact:"

IFC. n.d. "Leveraging Market Opportunities to Achieve Development Impact: Entrepreneurial Solutions to Improve Access to Sanitation and Safe Water."

IFC, and WSP. 2014. "Selling Sanitation Initiative: Update." WSP.

Ikeda, John, and Heather Arney. 2015. "Financing Sanitation for the Poor: Household Level Financing to Address the Sanitation Gap in India." WSP.

Institute of Development Studies. 2016. "Sustainable Sanitation for All: Experiences, Challenges, and Innovations." <https://doi.org/10.3362/9781780449272>.

Intellect. 2013. "Invest. Catalyze. Mainstream: The Indian Impact Investing Story."

- IRC. 2012. "IRC Business Plan 2012-2016."
- IRC. 2011. "Sanitation, Hygiene And Water (SHAW) Programme for East Indonesia Report on the Review and Planning Workshop."
- IRC. n.d. "Small Scale Independent Providers of Water and Sanitation to the Urban Poor."
- IRC. 2001. "Public Private Partnerships for Community Water Supply and Sanitation."
- IRC. 2010. "Sanitation, Hygiene And Water (SHAW) Programme for East Indonesia IRC Mission Report."
- IRC. 2014. "Learning, Adapting, Embedding: Experiences and Lessons from the Triple-S Initiative in Uganda."
- IRC, and CREPA. 2005. "Microfinance and Innovative Mechanisms to Achieve the MDGs in the Water and Sanitation Sector in Sub-Saharan Africa." In Regional Workshop on Microfinance in Sub-Saharan Africa. Dakar, Senegal.
- IRC, GIZ, UNICEF, and WaterAid. 2011. "Sanitation and Hygiene Promotion for the Urban Poor: Recommendations from the East Africa Practitioners' Workshop on Pro-Poor Urban Sanitation and Hygiene."
- IRC, and Ingeborg Krukkert. 2011. "Vietnam: Highlights from Rural Sanitation Supply Chain and Finance Workshop." 2011.
- ISF-UTS. 2011. "Vietnam Water, Sanitation and Hygiene Sector Brief." https://www.uts.edu.au/sites/default/files/ISF_VietnamWASH.pdf.
- ISF-UTS. 2014. "Financing Sanitation for Cities and Towns."
- Isobel, Davis. 2015. "CLTS Engagement, Outcomes and Empowerment in Malagasy Communities." WSSCC.
- Ito, Ryusei, Ken Ushijima, Nowaki Hijikata, and Naoyuki Funamizu. 2012. "Survey of Sanitation Conditions in Burkina Faso for Design of Toilet." Hokkaido University.
- Ive, Oliver. n.d. "Social Franchising Partnerships for O&M of Sanitation & Water Services." Water Research Commission.
- IWA. 2006. "Sanitation 21 - Simple Approaches to Complex Sanitation: A Draft Framework for Analysis."
- Jackson, Barry. 2004. "Lessons on What Drives Demand for Improved Sanitation." WSP.
- Jackson, Barry. 2005. "A Review of EcoSan Experience in Eastern and Southern Africa." Sanitation and Hygiene Series.
- Jacob, Nitya, Anja von Falkenhausen, and Magdalena Bauer. n.d. "Corporate Engagement in Sanitation." Sustainable Sanitation Alliance.
- Jalle, Christophe Le, and Cleo Lossouarn. 2015. "Decentralised Solidarity Financing for Access to Water and Sanitation for All." SIAAP.
- Jansen, Anne. n.d. "Reinvent the Toilet Challenge Expert Convening." TUDelft.

- Jenkins, Joseph. 2015. "Thermophilic Composting As a Sanitation Alternative GiveLove.Org Project, Santo Village, Leogane, Haiti - A Case Study." In 5th International Dry Toilet Conference.
- Jenkins, Marion W. 2004. "Who Buys Latrines, Where and Why?" WSP. [https://esa.un.org/iys/docs/san_lib_docs/Who Buys Latrines.pdf](https://esa.un.org/iys/docs/san_lib_docs/Who%20Buys%20Latrines.pdf).
- Jenkins, Marion W., and Danielle Pedi. 2013. "Situation Analysis: How Do I Know If Sanitation Marketing Will Work in My Country?" UNICEF.
- Jenkins, Marion W., and Danielle Pedi. 2013. "Consumer Behaviour: How Do We Understand Sanitation Consumers in Target Markets?" UNICEF.
- Jenkins, Marion W., and Danielle Pedi. 2013. "Equity in Sanitation Marketing: How Can We Support the Market to Reach the Poorest?" UNICEF.
- Jenkins, Marion W., and Beth Scott. 2007. "Opportunities for Sanitation Marketing in Uganda." USAID.
- Jenkins, Marion W., and Beth Scott. 2010. "Sanitation Marketing for Managers." Guidance and Tools for Program Development. Washington DC: USAID.
- Jenkins, Marion W., and Beth Scott. 2007. "Behavioral Indicators of Household Decision-Making and Demand for Sanitation and Potential Gains from Social Marketing in Ghana." *Social Science & Medicine* 64 (12): 2427–42. <https://doi.org/10.1016/j.socscimed.2007.03.010>.
- Jenkins, Marion W., and Steven Sugden. 2006. "Rethinking Sanitation: Lessons and Innovation for Sustainability and Success in the New Millennium." UNDP.
- Jensen, Lene, and Craig Usswald. 2014. "Sanitation Consumer Demand & Supply Chain Assessment for the Rural Mekong River Delta." WSP.
- Jo, Sae. 2008. "Unlocking the Potential of Domestic Private Sector Participation in Water and Sanitation Services." WSP.
- Johannessen, Åse, Julie Patinet, William Carter, and Jenny Lamb. 2012. "Sustainable Sanitation for Emergencies and Reconstruction Situations." Sustainable Sanitation Alliance.
- Jones, Oliver. 2015. "Monitoring Sanitation and Hygiene in Rural Ethiopia: A Diagnostic Analysis of Systems, Tools and Capacity." WSP.
- Jones, Stephen, Nicola Greene, Andrés Hueso, Hayley Sharp, and Ruth Kennedy-walker. 2013. "Learning from Failure: Lessons for the Sanitation Sector." UK Sanitation Community of Practice. BPD Water and Sanitation; WEDC; IWA.
- Kabir, Babar. n.d. "BRAC Paper on Sanitation Loans." BRAC.
- Kallinowsky, Ellen. 2012. "In Focus: GIZ Target Countries." News on Cooperation with the Private Sector in Africa. 2012.
- Kamasan, Ari. 2008. "The Application of SaniFOAM in TSSM Indonesia." WSP.
- Kamasan, Ari. 2012. "Demand Creation and Product Promotion in Sanitation Marketing East Java Experience." WSP.

- Kaminsky, Jessica, and Elizabeth Jordan. 2017. "Qualitative Comparative Analysis for WASH Research and Practice." *Journal of Water, Sanitation and Hygiene for Development* 7 (2). IWA Publishing: 196–208. <https://doi.org/10.2166/washdev.2017.240>.
- Kappauf, Leonie. 2011. "Opportunities and Constraints for More Sustainable Sanitation through Sanitation Marketing in Malawi Case Study from Mzimba and Lilongwe Districts." Loughborough University.
- Karanja, Nancy. 2013. "Peepoo - A Sanitation Solution Addressing the Urban Poor." In IWA Development Congress. Nairobi, Kenya.
- Kari, Anna. 2011. "Sanitation Framework." WaterAid. <https://doi.org/10.3362/1756-3488.2013.029>.
- Kariuki, Mukami, Bernard Collignon, Regis Taisne, and Valfrey Bruno. 2003. "Better Water and Sanitation for the Urban Poor: Good Practice from Sub-Saharan Africa." WUP; WSP.
- Keen, Mark, and Sheelagh O'Reilly. 2015. "Global Sanitation Fund (GSF): Mid Term Evaluation: Synthesis Note for Tranche I: Madagascar, Nepal, Senegal, Malawi, India, Cambodia and Uganda." WSSCC.
- Khan, Akhter Hameed. 1992. "Orangi Pilot Project." <https://doi.org/10.1177/095624789500700216>.
- Kharal, L. 2015. "Mainstreaming Social Marketing in the WASH Interventions of Terre Des Hommes in South Asia." In 38th WEDC International Conference. Loughborough, UK.
- Khataza, Robertson. 2008. "A \$0.14 Toilet in a Month: Financing Urban Eco-Sanitation through Group Savings in Malawi." In IRC Symposium: Sanitation for the Urban Poor Partnerships and Governance, 19–21. Delft, The Netherlands.
- Khatri, Nam Raj. n.d. "Sustainability and Climate Change Aspects of Ecosan Toilet: Nepal Prospective." Sustainable Sanitation Alliance.
- Khatri, Nam Raj. 2015. "Future of Ecological Sanitation (EcoSan) Globally." In 5th International Dry Toilet Conference.
- Kibata, Ndirangu. 2000. "Internet Based Computing Model for Effective Delivery of Services." University of Durban-Westville.
- Kinstedt, Katherine. 2012. "The Application of Ecological Sanitation for Excreta Disposal in Disaster Relief: Experience, Selection and Design." Institute of Wastewater Management and Water Protection.
- Koh, Harvey, Samantha King, Ahmed Irfan, Rishi Agarwal, Ashvin Dayal, and Anna Brown. 2017. "Shaping Inclusive Markets." FSG.
- Koivisto, Jenni, Jonna Heikkilä, and Anniina Kirstinä. 2012. "Changing Attitudes towards Dry Sanitation in Msunduzi, Swaziland." In 4th International Dry Toilet Conference.
- Kome, Antoinette. 2011. "Landscape Analysis and Business Model Assessment in Fecal Sludge Management." SNV.
- Korea International Cooperation Agency, UNEP, and Center for Advanced Philippine Studies. 2011. "Philippines Case Studies."
- Korea International Cooperation Agency, UNEP, and Center for Advanced Philippine Studies. 2011. "Cambodia Case Studies."

Kov, Phyrum, Nga Kim Nguyen, and Virak Chan. 2015. "Expanding Reach into Sanitation Market through Behavior Change Communications Lessons from Rural Cambodia." WSP.

Kraemer, Pedro. n.d. "Developing City Wide Planning Instruments for Decentralized Urban Sanitation Services." BORDA.

Kulkarni, Sampada, and RS Arun Kumar. 2010. "Malaprabha Technology Dehu Village, Pune, Maharashtra, India." Sustainable Sanitation Alliance.

Kullmann, Craig. 2008. "Developing a Sanitation Behavior Change Framework: SaniFOAM." WSP.

Kullmann, Craig, and Rokeya Ahmed. 2011. "Long Term Sustainability of Improved Sanitation in Rural Bangladesh - Research Brief." WSP.

Kumar, Ajith, and Upneet Singh. 2012. "You Manage What You Measure: Using Mobile Phones to Strengthen Outcome Monitoring in Rural Sanitation." WSP.

Kumar, Vipul, Ruchika Shiva, and Manu Prakash. 2016. "Enabling Rural Sanitation: Understanding the Business Perspective." IRC International Water and Sanitation Centre; Ennovent.

Kvarnström, E, J Verhagen, M Nilsson, V Srikantaiah, S Ramachandran, and K Singh. 2012. "The Business of the Honey-Suckers in Bengaluru (India): The Potentials and Limitations of Commercial Faecal Sludge Recycling." IRC International Water and Sanitation Centre.

Kwolek, Michael. 2012. "The Role of Business Member Organizations in Supporting Sanitation Entrepreneurs in Uganda, Rwanda and Malawi – A Research Study for Water For People." Water for People.

Kwolek, Michael. 2012. "Sanitation Finance Access to Capital for Entrepreneurs and End-Users."

Kyomugisha, Jennifer, and Michael Wood. 1999. "Sanitation Infrastructure by the Private Sector." In 25th WEDC Conference, 45–47. Addis Ababa, Ethiopia.

Lammerding, André, Dirk Schäfer, Simone Klawitter, Andrea Goertler, and Esther Gerlach. 2009. "All Inclusive ? How Regulation in Water and Sanitation Can Be Pro-Poor: Lessons from Sub-Saharan Africa." GIZ.

Langergraber, Günter, Elke Müllegger, and Markus Lechner. 2010. "The ROSA Project." EcoSan Club.

Larsen, Tove A., Heiko Gebauer, Harald Gründl, Rahel Künzle, Christoph Lüthi, Ulrike Messmer, Eberhard Morgenroth, and Bernhard Ranner. 2012. "Diversion for Safe Sanitation: A New Approach to Sanitation in Informal Settlements." EAWAG.

Luis McGregor, Jorge. n.d. "Change of Water and Sanitation Services Management Model in Small Towns with a Participatory Approach." WSP.

Maanen, Peter Van, Rita Jen, Peter Harvey, Murat Sahin, Matteus Van Der, Carlota Sophie, Jane Bevan, Henk Van Norden, and Kathryn Harries. 2010. "Sanitation Marketing in a CATS Context: A Discussion Paper." UNICEF.

Macarthur, J, F. C. Riggs, and R. Chowdhury. 2015. "Disruptive Design in Sanitation Marketing: Lessons from Product and Process Innovations in Bangladesh." In 38th WEDC International Conference. Loughborough, UK.

- Macleod, Neil. n.d. "Change and Innovation in Utility Management in Low and Middle Income Countries."
- Macwan, Martin, Martin Wafler, and Johannes Heeb. 2009. "Sanitation Improvements at Navsarjan Boarding Schools, Gujarat, India - Draft." Sustainable Sanitation Alliance.
- Mader, Philip. 2011. "Attempting the Production of Public Goods through Microfinance: The Case of Water and Sanitation." *Journal of Infrastructure Development* 3 (2): 153–70. <https://doi.org/10.1177/097493061100300204>.
- Mader, Philip. 2011. "Making the Poor Pay for Public Goods via Microfinance Economic and Political Pitfalls in the Case of Water and Sanitation." Max Planck Institute for the Study of Societies.
- Maduka, Christian Chibuzo. 2015. "Solutions to Cultural Challenges and Stigmatization Associated With Dry Sanitation in Abakaliki, South Eastern Nigeria." In 5th International Dry Toilet Conference.
- Maiga, Taibou Adamou, Yolande Coombes, and Jacqueline Devine. 2015. "Strengthening Policies, Strategies, and Institutional Arrangements for Scaling up Rural Sanitation in Niger: A Case Study." WSP.
- Mamun, A S A Abdullah Al, and B. Islam Monirul. 2012. "Eco-Toilet: An Ecological Sanitation Option for Difficult Areas of Bangladesh (Practice)." In Asia Regional Sanitation and Hygiene Practitioners Workshop. Dhaka, Bangladesh.
- Manula, G.K., B.N. Mugwima, J. Omotto, and E Rosana. 2015. "Managing Human Waste in Informal Settlements: Bio-Centres in Kibera Informal Settlement, Kenya." In 5th International Dry Toilet Conference.
- Mara, Duncan. 1996. "Low Cost Urban Sanitation in Lesotho." WSP.
- Mara, Duncan, Peter Cornel, Susanne Bieker, and Alain Mathys. 2009. "Sanitation Options for Low Income Urban Areas: Technical Options and Financial Arrangements." In KfW Water Symposium. Frankfurt, Germany.
- Mathews Burwell, Sylvia. 2011. "Reinventing the Toilet - Cranfield University." Cranfield University. <http://www.gatesfoundation.org/media-center/speeches/2011/07/sylvia-mathews-burwell-reinventing-the-toilet>.
- Mazeau, A, and R Scott. 2015. "Should NGOs Lead Post-Emergency Sanitation Marketing? Experience from Jacmel, Haiti." In 38th WEDC International Conference. Loughborough, UK.
- Mbaguta, Alex Muhumuza. 2008. "Partnerships for Sanitation for the Urban Poor." In IRC Symposium: Sanitation for the Urban Poor Partnerships and Governance. Delft, The Netherlands.
- Mccutcheon, Murray. 2012. "Omni-Processor: Waste-to-Energy Technology Assessment – Final Presentation." Lux Research.
- Mcgranahan, Gordon, and David Lloyd Owen. 2006. "Local Water Companies and the Urban Poor." IIED - Human Settlements Discussion Paper Series Theme: Water-4. IIED.
- McGranahan, Gordon, and David Satterthwaite. 2006. "Governance and Getting the Private Sector To Provide Better Water and Sanitation Services To the Urban Poor." IIED - Human Settlements Discussion Paper Series Theme: Water-2. IIED.

McIntosh, Arthur, Thelma Triche, and Geeta Sharma. 2009. "Guidance Notes on Services for the Urban Poor: A Practical Guide for Improving Water Supply and Sanitation Services." WSP.

McIntyre, Peter. n.d. "Private Sector Role Is Critical to Meeting WASH Targets." IRC International Water and Sanitation Centre.

McIntyre, Peter, Deirdre Casella, Catarina Fonseca, and Peter Burr. 2014. "Uncovering the Real Costs of Water and Sanitation." IRC International Water and Sanitation Centre.

Mehta, Dinesh. n.d. "Urban Development and WATSAN Services in Low and Middle Income Countries." CEPT University.

Mehta, Meera. 2008. "Assessing Microfinance for Water and Sanitation: Exploring Opportunities for Sustainable Scaling up." BMGF.

Mehta, Meera. 2003. "Meeting the Financing Challenge for Water Supply and Sanitation: Incentives to Promote Reforms, Leverage Resources and Improve Targeting." WSP.

Mehta, Meera, and Andreas Knapp. 2004. "The Challenge of Financing Sanitation for Meeting the Millennium Development Goals." In 12th Session of the United Nations Commission on Sustainable Development. New York, USA.

Mehta, Meera, and Dinesh Mehta. 2013. "Performance Assessment Systems PAS Project: Urban Water Supply and Sanitation IWA." In IWA Development Congress. Nairobi, Kenya.

Mehta, Meera, and Dinesh Mehta. 2013. "Urban Sanitation Assessing Priorities and Options." In IWA Development Congress. Nairobi, Kenya.

Mehta, Meera, and Kameel Virjee. 2003. "Financing Small Water Supply and Sanitation Service Providers Exploring the Microfinance Option in Sub-Saharan Africa." WSP.

Mekonta, Lemessa, Bethel Terefe, John Butterworth, and Bekele Damte. 2016. "Self-Supply in Seven Woredas: Report of a Baseline Survey for Millenium Water Alliance Self-Supply Acceleration Pilots." IRC International Water and Sanitation Centre. <https://doi.org/10.1017/CBO9781107415324.004>.

Migan, Sylvain Adokpo. 2015. "Benin – Innovative Public Private Partnerships for Rural Water Services Sustainability - A Case Study." WSP.

Milward, Kirsty, Sisir Pradhan, and Katherine Pasteur. n.d. "Promising Pathways Innovations and Best Practices in CLTS at Scale in Madagascar." CLTS Foundation.

Ministry of Health - Ethiopia. 2006. "National Hygiene and 'On-Site' Sanitation Protocol."

Ministry of Health - Kenya. 2014. "Kenya Environmental Sanitation and Hygeine Policy 2016-2030."

Ministry of Health - Kenya. 2016. "Kenya Environmental Sanitation and Hygiene Strategic Framework (Kessf) 2016 - 2020."

Ministry of Housing and Urban Development - Sri Lanka. n.d. "New Approach to Sanitation."

Ministry of Physical Planning and Works - Nepal. 2004. "Rural Water Supply and Sanitation National Policy and National Strategy" 2004.

Mishra, Vinod, and Bhavna Thakur. 2015. "Practical Ideas and Experiences for Swachh Bharat Mission (Gramin) Campaigns." Ministry of Drinking Water and Sanitation, Government of India.

Monitor Deloitte. 2012. "Supporting Sustainable Sanitation Improvements in Bihar through Supply-Side Strengthening: Customer Behavior." Monitor Deloitte.

Morgan, Peter. 2007. "Lessons from a Low Cost Ecological Approach to Sanitation in Malawi." WSP.

Muchiri, E, Benedict Mutua, and Elke Muellegger. 2010. "Private Sector Involvement in Operating a Sanitation System with Urine Diversion Dry Toilets in Nakuru, Kenya." Sustainable Sanitation Practice, no. 2.

Muchiri, Edward, and Benedict Mutua. 2011. "UDDTs at a Church and Nursery School Nakuru, Kenya." Sustainable Sanitation Alliance.

Mugo, Kariuki. 2008. "Unlocking the Potential of Domestic Private Sector in the Delivery of Water Sanitation Services to the Urban Poor." WSUP.

Mukasine, Beatrice, and Arno Rosemarin. 2015. "Ecological Sanitation, a Scalable Model for Rwanda." In 5th International Dry Toilet Conference.

Mukherjee, Nilanjana. 2001. "Achieving Sustained Sanitation for the Poor." WSP.

Mukherjee, Nilanjana. 2009. "Learning at Scale Total Sanitation and Sanitation Marketing Project: Indonesia Country Update." WSP.

Mukherjee, Nilanjana. 2011. "Factors Associated with Achieving and Sustaining Open Defecation Free Communities: Learning from East Java." WSP.

Müllegger, Elke, Günter Langergraber, Elisabeth Freiberger, Jennifer R McConville, Margriet Samwel, Christian Rieck, and Pippa Scott. 2011. "Operation and Maintenance of Sustainable Sanitation Systems." Sustainable Sanitation Alliance Factsheet.

Müllegger, Elke, Günter Langergraber, and Markus Lechner. 2010. "Sanitation as a Business." EcoSan Club, no. 5.

Müllegger, Elke, Günter Langergraber, and Markus Lechner. 2010. "Operation and Maintenance: Successful Models for O&M of Sanitation Systems." EcoSan Club, no. 2.

Mwangi, Patrick Nduati, Lilian Otiego, and Charlotte Ndakorerwa. 2015. "Innovation in Scaling up Access to Water and Sanitation Services in Kenya Briefing Note to Support Innovation in Scaling up Access of Water and Sanitation Services to Urban Low Income Areas." WSP.

Nabembezi, Dennis, Simon Ddembe, Fred Nuwagaba, and Flugencio Jjuuko. 2011. "Harnessing the Power of Public-Private-Partnership (PPP) and Sanitation Marketing in Promoting Urban Poor Sanitation: Lessons from GTZ/JICA/CIDI Pilot Project in Nateete Parish Informal Settlements, Kampala District." In East Africa Practitioners Workshop on Pro Poor Urban Sanitation and Hygiene. Kigali, Rwanda.

Narayanan, Ravi, Henk van Norden, Louisa Gosling, and Archana Patkar. 2011. "Equity and Inclusion in Sanitation and Hygiene in South Asia: A Regional Synthesis Paper." UNICEF; WaterAid; WSSCC.

Narayanan, Shankar. 2015. "Learning from Bihar, India: An Evolutionary Process and the Impact of a Market Development Program to Create a Functioning Sanitation Market." In UNC Water & Health Conference. Chapel Hill, NC.

Nattabi, Harriet, Amos Bakeine, Yolande Coombes, and Samuel Mutono. 2015. "Strengthening the Enabling Environment to Scale up Rural Sanitation in Uganda Developing a Rural Sanitation Market in Uganda." WSP.

Newman, Adam, Susanna Smets, and Phyrum Kov. 2014. "Making Toilets More Affordable for Cambodia's Poor through Microfinance." WSP.

Nga Dao, Ngoc. 2014. "Community Hygiene Output-Based Aid Program in Vietnam (CHOBA): Research Research on Institutional Factors Affecting Sanitation Implementation." East Meets West Foundation.

Nguyen, Cuong Chi, Tung Phung, Hong Hanh Nguyen, Per Ljung, Daniel Westbrook, and Jeff Albert. 2016. "Smart Subsidies Help the Rural Poor Climb the Sanitation Ladder." In WASH Futures Water Sanitation and Hygiene Conference. Brisbane, Australia.

Nguyen, Hong Hanh. 2011. "Integrating Sanitation Marketing into a National Program: A Case Study in Vietnam." University of Queensland.

Nguyen, Minh Chau, Per Ljung, and Hong Hanh Nguyen. 2014. "Output-Based Aid for Delivering WASH Services in Vietnam: Ensuring Sustainability and Reaching the Poor." In 37th WEDC International Conference. Hanoi, Vietnam.

Nguyen, Nga Kim, Hang Diem Nguyen, Lene Gerwel-Jensen, Minh Thi Hien Nguyen, and Duong Chi Nam. 2016. "Understanding Determinants of Access to Hygienic Latrines for Rural Households in Vietnam." WSP.

Nickson, Andrew. 2001. "Establishing and Implementing a Joint Venture. Water and Sanitation Services in Cartagena, Colombia." Building Municipal Capacity for Private Sector Participation Series. Vol. 442.

Nicoletti, C, Yi Wei, and Stu Taylor. 2016. "An Approach to Measurement of the Sustainability of Sanitation Marketing WASH Programs." In 39th WEDC International Conference. Kumasi, Ghana.

Nielsen Indonesia. 2009. "Total Sanitation and Sanitation Marketing Research Report."

Niwagaba, C B. 2011. "The Role of Urban Authorities and Utilities in Promoting Sanitation as a Business." In LCM Summit. Kampala, Uganda.

Norman, Guy, Catarina Fonseca, and Ruzica Jacimovic. 2015. "Financing Water and Sanitation for the Poor: The Role of Microfinance Institutions in Addressing the Water and Sanitation Gap." WSP.

Norman, Guy, Catarina Fonseca, and Sophie Trémolet. 2015. "Domestic Public Finance for WASH: What, Why, How?" IRC International Water and Sanitation Centre; WSUP; Trémolet Consulting.

Nothomb, Christophe, Mariëlle Snel, Katharine McHugh, Andy Narracott, and John Sauer. 2014. "Sanitation as a Business: Unclogging the Blockages." In Sanitation as a Business: Unclogging the Blockages. Kampala, Uganda: IRC, PSI, WSUP, Water For People.

Nuwagaba, Fred. 2011. "Leveraging Impact at Scale through Innovative Financing for Slum Sanitation: PPPs, Microcredit Schemes and Local Entrepreneurship Concept for Slum Sanitation in Uganda." In East Africa Practitioners Workshop on Pro Poor Urban Sanitation and Hygiene. Kigali, Rwanda.

O'Neill, M. 2012. "Bringing The Ecological Back to Sanitation— The Need for Changes in Attitudes, Practices And Policies." In 4th International Dry Toilet Conference.

Obika, Amaka. 2004. "The Process for Sanitation Marketing." Loughborough University.

OECD. 2008. "Donor Profiles on Aid To Water Supply."

OPP Institutions. 2004. "Orangi Pilot Project: Institutions and Programs 99th Quarterly Report."

Oyo, Anthony. 2002. "Creating Successful Private Sector Supply Chains." WSP.

Pan, Sophia, Neil Armitage, and Mark van Ryneveld. n.d. "Why Getting a Toilet Does Not Solve the Sanitation Crisis: Experience from Cape Town." University of Cape Town.

Parker, Alison, Bruce Jefferson, Rob Dorey, Athanasios Kolios, Sean Tyrrel, Phil Longhurst, Simon Bolton, et al. 2015. "The Nano Membrane Toilet." Cranfield University.

Parkinson, Jonathan, Christoph Lüthi, and Dirk Walther. 2014. "Sanitation 21: A Planning Framework for Improving City-Wide Sanitation Services." IWA.

Pasha, Hafiz A.*McGarry, Michael G. 1989. "Rural Water Supply and Sanitation in Pakistan: Lessons from Experience." World Bank.

PATH. 2012. "Analysis of the Sanitation Supply Chain in Rural and Small Towns in Uganda."

Patinet, Julie. 2011. "Household Pit Latrines with Urine Diversion in the Farchana Refugee Camp in Eastern Chad - Draft." Sustainable Sanitation Alliance.

Pauschert, Dirk, Katrin Gronemeier, and Katrin Brueback. 2012. "Urban Water and Sanitation Poverty in Tanzania: Evidence from the Field and Recommendations for Successful Combat Strategies." GIZ.

Peal, Andy, Barbara Evans, and Carolien van der Voorden. 2010. "Hygiene and Sanitation Software: An Overview of Approaches." WSSCC.

Pedi, Danielle, and William Davies. 2013. "Transforming Markets, Increasing Access: Early Lessons on Base-of-the-Pyramid Market Development in Sanitation." IFC.

Pedi, Danielle, and Marion W. Jenkins. 2013. "Enabling Environment: What Roles and Functions Are Needed in the New Sanitation Market?" UNICEF.

Pedi, Danielle, and Marion W. Jenkins. 2013. "Monitoring and Evaluation How Do We Measure Sanitation Marketing Progress?" UNICEF.

Pedi, Danielle, and Marion W. Jenkins. 2013. "Sanitation Marketing and CATS: How Do We Link Approaches?" UNICEF.

Pedi, Danielle, Marion W. Jenkins, Hengly Aun, Lyn McLennan, and Geoff Revell. 2011. "The 'Hands-Off' Sanitation Marketing Model: Emerging Lessons from Rural Cambodia." In 35th WEDC International Conference. Loughborough, UK.

Pedi, Danielle, Marion W. Jenkins, and Jeff Chapin. 2013. "Private Sector Development: How Do We Improve Capacity of Local Sanitation Businesses?" UNICEF.

Pedi, Danielle, Phyrum Kov, and Susanna Smets. 2012. "Sanitation Marketing Lessons from Cambodia: A Market-Based Approach to Delivering Sanitation." WSP.

Pedi, Danielle, Mel Sophanna, Pouy Sophea, and Marion W. Jenkins. 2014. "Rural Consumer Sanitation Adoption Study." WaterSHED.

- Pedro, João Paulo Borges. 2016. "Partially-Submersed Black Water Compact Treatment System for Floating Residences Mamirauá Sustainable Development Reserve, Amazon, Brazil: Case Study of Sustainable Sanitation Projects: Partially-Submersed Black Water Compact Treatment System for Floating." Sustainable Sanitation Alliance.
- Perez, Eduardo, Catherine Amelink, Jason Cardosi, Yolande Coombes, Jacqueline Devine, Amy Grossman, Ajith Kumar, Nila Mukherjee, and Alex Orsola. 2009. "Progress Report: Indonesia, Tanzania and the States of Himachal Pradesh and Madhya Pradesh, India." WSP.
- Perez, Eduardo, Yolande Coombes, Jacqueline Devine, Amy Grossman, Craig Kullmann, Ajith Kumar, Nilanjana Mukherjee, et al. 2012. "What Does It Take to Scale Up Rural Sanitation?" WSP.
- Pinto, Rebekah. 2013. "Results, Impacts, and Learning from Improving Sanitation at Scale in East Java, Indonesia." WSP.
- Plan International. n.d. "Sanitation for a Better Cambodia: The Cambodia Rural Sanitation and Hygiene Improvement Program (CR-SHIP)."
- Pokharel, Surya Binod, and Deependra Kaji Thapa. 2015. "Baseline Study: SSH4A Nepal." SNV.
- Potter, Alana, Christophe Nothomb, and Benedict Tuffuor. 2015. "Technology Applicability Framework Questions: Mobile Desludging Units." IRC International Water and Sanitation Centre.
- Practical Action. 2010. "Proto Type Engineering Design of Eco-Toilet Action Research on Ecological Alternatives in Sanitation in Difficult Areas of Bangladesh."
- Practical Action, WSUP, AIAE, and WEDC. 2012. "Benchmarking of Urban Sanitation Pricing and Tariff Structure in Africa."
- Preskill, Hallie, and Srik Gopal. 2014. "Evaluating Complexity: Propositions for Improving Practice." FSG.
- PSI. 2014. "PSI Liberia Sanitation Business Models."
- PSI India. 2017. "Developing Markets for Sanitation: Where to Start?" SuSanA & BEAM Exchange. 2017. <https://www.youtube.com/watch?v=ReZTD8XCOGU&feature=youtu.be>.
- Quazi, Avizit Reaz, and Azahar Ali Pramanik. 2004. "The Sanitation Movement in Bangladesh and the Role of Private Sector." IRC International Water and Sanitation Centre.
- Quicksand. 2013. "Project Sammaan: Newsletter: April–May 2013."
- Quicksand. 2013. "Project Sammaan: Newsletter: March–April 2013."
- Quicksand. 2013. "Project Sammaan: Newsletter: May-June 2013."
- Quicksand. 2013. "Project Sammaan: Communal Sanitation for Urban Slums in India."
- Rama, Martina. 2016. "CLTS versus Other Approaches to Promote Sanitation: Rivalry or Complementarity?" In 39th WEDC International Conference. Kumasi, Ghana.
- Raman, Rajiv, and Andy Robinson. 2008. "Enabling Environment Assessment for Scaling Up Sanitation Programs: East Java, Indonesia." WSP.
- Ramani, Shyama V., Shuan SadreGhazi, and Geert Duysters. 2012. "On the Diffusion of Toilets as Bottom of the Pyramid Innovation: Lessons from Sanitation Entrepreneurs." *Technological Forecasting and Social Change* 79 (4). Elsevier Inc.: 12. <https://doi.org/10.1016/j.techfore.2011.06.007>.

- Rautanen, Sanna-Leena. 2015. "Solutions to Cultural Challenges in Scaling up Dry Sanitation in Nepal." In 5th International Dry Toilet Conference.
- Reed, Bob. 2014. "Septic Tank and Aqua Privy Design." WEDC.
- Remington, C, M Cherrak, N Preneta, and S Kramer. 2016. "A Social Business Model for the Provision of Household Ecological Sanitation Services in Urban Haiti." In 39th WEDC International Conference. Kumasi, Ghana.
- Revels, Catherine J. 2007. "Improving Health through Sanitation." WSP Access Newsletter. 2007.
- Reymond, Philippe. 2013. "Scaling Up Small-Scale Sanitation: A Policy Brief to Move Forward." EAWAG.
- Reymond, Philippe. 2015. "Scaling-up Small-Scale Sanitation in a Disabling Institutional and Regulatory Environment: Experiences from Egypt." In BORDA Symposium. Bremen, Germany: EAWAG.
- Rieck, Christian, E Von Muench, and Patrick Onyango. 2011. "Up-Scaling Lessons from the EU-Sida-GTZ Ecosan Promotion Project in Kenya." In 35th WEDC International Conference. Loughborough, UK.
- Rieck, Christian, and Patrick Onyango. 2010. "Public Toilet with Biogas Plant and Water Kiosk - Naivasha, Kenya." Sustainable Sanitation Alliance.
- Rios, Mike, and Marion W. Jenkins. 2013. "Demand Promotion and Marketing: How Do We Reach Rural Target Markets in Sanitation Marketing." UNICEF.
- Rivera, R., G. Joseph, Susanna Smets, Virak Chan, Per Ljung, S. Um, Hong Hanh Nguyen, and Jeff Albert. 2016. "The Effect of OBA Subsidies Combined with Sanitation Marketing (SanMark) on Latrine Uptake among Rural Populations in Cambodia." East Meets West Foundation; WSP.
- Roberts, Michael, Aaron Tanner, and Andrew McNaughton. 2007. "Demand Assessment for Sanitary Latrines in Rural and Urban Areas of Cambodia." WSP.
- Roberts, Michael, Aaron Tanner, and Andrew McNaughton. 2007. "Supply Chain Assessment for Sanitary Latrines in Rural and Peri-Urban Areas of Cambodia." WSP.
- Roberts, Peter. 2008. "Domestic Private Sector Provider Initiative." DFID.
- Robinson, Andy. 2010. "Sanitation Finance in Rural Cambodia Review and Recommendations." WSP.
- Robinson, Andy. 2011. "Enabling Environment Endline Assessment: Indonesia." WSP.
- Robinson, Andy. 2012. "Sanitation Finance in Rural Cambodia." WSP.
- Robinson, Andy. 2011. "Enabling Environment Endline Assessment: Tanzania." WSP.
- Robinson, Andy, and Ajaya Paul. 2000. "The Growth of Private Sector Participation in Rural Water Supply and Sanitation in Bangladesh: Developing Private Sector Supply Chain to Deliver Rural Water Technology." WSP.
- Roma, Elisa, Stefanie Holzwarth, and Chris Buckley. 2011. "Large-Scale Peri-Urban and Rural Sanitation with UDDTs eThekweni Municipality (Durban) South Africa." Sustainable Sanitation Alliance (SuSanA).
- Rosenboom, Jan Willem, Cordell Jacks, Phyrum Kov, Michael Roberts, and Tamara Baker. 2011. "Sanitation Marketing in Cambodia." *Waterlines* 30 (1): 21–40. <https://doi.org/10.3362/1756-3488.2011.003>.

Rosensweig, Fred, and Derko Kopitopoulos. 2010. "Building the Capacity of Local Government to Scale Up Community-Led Total Sanitation and Sanitation Marketing in Rural Areas." WSP.

Rosensweig, Fred, Eduardo Perez, and Andy Robinson. 2012. "Policy and Sector Reform to Accelerate Access to Improved Rural Sanitation." WSP.

SAAB. n.d. "SAAB India Update: Summary Report on SAAB in India."

Salter, Dan. 2008. "Sanitation Demand and Supply in Cambodia." WSP.

Sandrine, Menguze, Dorcas Mbuvi, Sarah Dickin, and Corinne Schuster-Wallace. 2014. "A Micro Financing Framework for Rural Water and Sanitation Provisioning in Sub-Saharan Africa." United Nations.

Sanergy. n.d. "Sanergy Receives Growth Investment from Consortium of Investors Including Eleos, Acumen Fund, and SpringHill Equity Partners." Accessed July 27, 2017. <http://www.sanergy/archives/2524>.

Sankar, U. n.d. "Financial and Economic Sustainability: Public-Private Partnership." Madras School of Economics.

Satterthwaite, David, Gordon McGranahan, and Diana Mitlin. 2005. "Community-Driven Development for Water and Sanitation in Urban Areas." In 13th Session of the Commission on Sustainable Development. WSSCC.

Sayre, Elmer V., and Elisabeth v. Münch. 2009. "Rural Community and School UDD Toilets in Misamis Rural Community and School UDD Toilets in Misamis Oriental, Libertad, Initao and Manticao, Philippines." Sustainable Sanitation Alliance (SuSanA).

Sayre, Elmer V., and Jed Christian Z Sayre. 2010. "With Our Own Hands: Experiences in Promoting Ecological Sanitation and Food Security in Mindanao." WAND Foundation.

Saywell, Darren, and Catarina Fonseca. 2006. "Microfinance for Sanitation." WELL Factsheet. Loughborough University.

Schaub-Jones, David. 2009. "Harnessing the Private Sector to Provide Sanitation to the Poor: Stockholm Session Briefing 2009." BPD Water and Sanitation.

Schaub-Jones, David. 2009. "Engaging Sanitation Entrepreneurs Supporting Sanitation Entrepreneurs in Lesotho – 20 Years of Experience." BPD Water and Sanitation.

Schaub-Jones, David. 2009. "To Let or Toilet? Is That the Question? The Hidden Challenges of Selling Sanitation." BPD Water and Sanitation.

Schaub-Jones, David. 2010. "Should We View Sanitation as Just Another Business?" Enterprise Development and Microfinance 21 (3): 185–204.

Scheu, Manfred. n.d. "Sustainable Water Supply and Sanitation." GIZ.

Schröder, Enno. 2016. "Upscaling Basic Sanitation for the Urban Poor (UBSUP) in Kenya." Sustainable Sanitation Alliance.

Schuen, Richard, Jonathan Parkinson, and Andreas Knapp. 2009. "Study for Financial and Economic Analysis of Ecological Sanitation in Sub-Saharan Africa." WSP.

- Schusterman, Ricardo, Florencia Almansi, Ana Hardoy, Gordon McGranahan, Iris Oliverio, Ruth Rozensztein, and Gastón Urquiza. 2002. "Public Private Partnerships and the Poor: Experiences with Water Provision in Four Low-Income Barrios in Buenos Aires." IIED.
- Scott, Beth, Marion W. Jenkins, and Gabriel Kpinsoton. 2011. "Experiences from Rural Benin: Sanitation Marketing at Scale." WSP.
- Senzia, M. A. 2011. "UDDTs for Teachers at a Primary School Arusha, Tanzania." Sustainable Sanitation Alliance.
- Shah, Arpit, Jithamithra Thathachari, Rishi Agarwal, and Ashish Karamchandani. 2013. "A Market Led, Evidence Based, Approach to Rural Sanitation." Mumbai, India: Monitor Deloitte.
- Shah, Neil Buddy, Stuart Shirrell, Andrew Fraker, Paul Wang, and Esther Wang. 2013. "Understanding Willingness to Pay for Sanitary Latrines in Rural Cambodia: Findings from Four Field Experiments of iDE Cambodia's Sanitation Marketing Program." IDinsight.
- Shewa, W, and B Geleta. 2010. "Fossa Alterna for Household Sanitation Arba Minch, Ethiopia." Sustainable Sanitation Alliance.
- Shrestha, Yubraj. 2015. "Lessons Learned from Community Mobilization to Improve Sanitation in a Rural Village in Nepal." In 5th International Dry Toilet Conference.
- Sijbesma, Christine. 2008. "Sanitation and Hygiene in South Asia: Progress and Challenges." IRC International Water and Sanitation Centre, 359–400.
- Sijbesma, Christine. 2011. "Sanitation Financing Models for the Urban Poor." IRC International Water and Sanitation Centre.
- Sijbesma, Christine, C Diaz, Catarina Fonseca, and C Pezon. 2008. "Financing Sanitation in Poor Urban Areas." In IRC Symposium: Sanitation for the Urban Poor Partnerships and Governance. Delft, The Netherlands: IRC. <http://www.ircwash.org/sites/default/files/Sijbesma-2008-Financing.doc>.
- Sijbesma, Christine, Truong Xuan Truong, and Jacqueline Devine. 2010. "Case Study on Sustainability of Rural Sanitation Marketing in Vietnam." WSP.
- Sijbesma, Christine, Truong Xuan Truong, and Jacqueline Devine. 2011. "Research on the Sustainability of Rural Sanitation Marketing in Vietnam." WSP.
- Singeling, Mascha, Frederik Claasen, Deirdre Casella, Tettje Van Daalen, and Catarina Fonseca. 2009. "Smart Finance Solutions: Examples of Innovative Financial Mechanisms for Water and Sanitation." IRC International Water and Sanitation Centre.
- Smits, Stef, and Baby Kurian. 2013. "Islands of Success: Towards Water, Sanitation and Hygiene Services for Everyone, Forever in Patharpratima and Sagar Blocks, West Bengal, India." IRC International Water and Sanitation Centre.
- Snel, Mariëlle. 2014. "IRC Partners with CRS on Sanitation Marketing Training." IRC Newsletter. 2014.
- Snel, Mariëlle, and Jo Smet. 2006. "The Value of Environmental Sanitation – Case Studies." 42. Occasional Paper Series. Delft, The Netherlands.
- Snell, Suzanne. 1998. "Water and Sanitation Services For The Urban Poor. Small-Scale Providers: Typology & Profiles." WSP.

- SNV. n.d. "Developing the Sanitation Supply Chain: Lessons From Bhutan." SNV.
- SNV, and IRC. 2011. "Summary of the D Group Discussion Rural Sanitation Supply Chains and Finance". In Workshop on Rural Sanitation Supply Chains and Finance. Dien Bien Province, Vietnam.
- SNV, and IRC. 2012. "Scaling Up Rural Sanitation and Hygiene." In Asia Workshop on Scaling up Rural Sanitation and Hygiene. Nghe An Province, Vietnam.
- So, Jae. 2008. "Water and Sanitation Program Discussion Session B Medium Term Sub-Sectoral Strategies." WSP.
- Solo, Tova Maria. 1998. "Competition in Water and Sanitation: The Role of Small-Scale Entrepreneurs." Viewpoint. World Bank.
- Sow, J A, and L Ouedraogo. 2016. "Public-Private Partnership for Inclusive Sanitation in Informal and Peri Urban Areas of Ouagadougou." In 39th WEDC International Conference. Kumasi, Ghana: WEDC.
- Sparkman, David. n.d. "From Beneficiaries to Businesses to the Big Picture: Monitoring for Sustainability in Market-Based Approaches to Sanitation." Water for People.
- Stavros, Jacqueline. 2013. "Capacity Building - Making Decentralised Sanitation Central to Thinking and Practice." In 3rd IWA Development Congress and Exhibition. Nairobi, Kenya: BORDA; Consortium for DEWATS Dissemination Society.
- Still, David, and Mark O'Riordan. 2012. "Tackling the Challenges of Full Pit Latrines. Volume 3: The Development of Pit Emptying Technologies." Water Research Commission. Vol. 3. Water Research Commission.
- Sturm, Guido, and Georgios Stefanidis. n.d. "Plasma Gasification for Toilet Challenge." Delft University.
- Sugden, Steven. 2013. "Interim Learning Report: Catalyzing Sanitation as a Business." Water for People.
- Sullivan, Hannah. 2002. "Hygiene and Sanitation Education: A Substitute or Accompaniment to Infrastructure?"
- Suntura, Juan Carlos, and Blanca Iris Sandoval. 2012. "Large-Scale Ecological Sanitation in Peri-Urban Area El Alto City, Bolivia." Sustainable Sanitation Alliance.
- Suntura, Juan Carlos, and Blanca Iris Sandoval. 2013. "EcoSan a Gran Escala En Una Zona Periurbana EcoSan a Gran Escala En Una Zona Periurbana El Alto, Bolivia." Sustainable Sanitation Alliance.
- Swann, Peregrine, Andrew Cotton, Darren Saywell, Barbara Evans, Sandy Cairncross, Peter Newborne, Laura Webster, and Peter Ryan. 2007. "Sanitation Policy Background Paper: Water Is Life, Sanitation Is Dignity." DFID.
- Swiss Agency for Development and Cooperation. 1998. "Water and Environmental Sanitation in Low Income Urban Areas." In 10th ITN Africa Conference. Nairobi, Kenya.
- Sy, Jemima, and Robert Warner. 2014. "Tapping the Markets: Opportunities for Domestic Investments in Water and Sanitation for the Poor. Directions in Development." Washington DC: World Bank. <https://doi.org/10.1596/978-1-4648-0134-1>.
- Thang, Pham, H. Tuan, and Guy Hutton. 2008. "Economic Impacts of Sanitation in Vietnam." WSP. <https://doi.org/10.1193/1.1585864>.

Tilley, Elizabeth, Christoph Lüthi, Antoine Morel, Christian Zurbrügg, and Roland Schertenleib. 2014. "Compendium of Sanitation Systems and Technologies." EAWAG.

Toilet Board Coalition. 2016. "The Digitisation of Sanitation."

Toilet Board Coalition. 2016. "Sanitation in the Circular Economy - Transformation to a Commercially Valuable, Self-Sustaining, Biological System."

Trémolet, Sophie. 2012. "Sanitation Markets: Using Economics to Improve the Delivery of Services along the Sanitation Value Chain." London School of Hygiene & Tropical Medicine; IIED; WaterAid.

Trémolet, Sophie. 2011. "Scaling Up Rural Sanitation: Identifying the Potential for Results-Based Financing for Sanitation." WSP.

Trémolet, Sophie, and Barbara Evans. 2010. "Output-Based Aid for Sustainable Sanitation." Washington, DC: WSP.

Trémolet, Sophie, Pete Kolsky, and Eduardo Perez. 2011. "Financing Household On-Site Sanitation for the Poor." WSP.

Trémolet, Sophie, Pete Kolsky, and Eduardo Perez. 2010. "Financing On-Site Sanitation for the Poor: A Six Country Comparative Review and Analysis." WSP.

Trémolet, Sophie, and T V S Ravi Kumar. 2013. "Evaluating the Potential of Microfinance for Sanitation in India." London School of Hygiene & Tropical Medicine; IIED; WaterAid.

Trémolet, Sophie, Goufrane Mansour, and George Muruka. 2015. "Developing Microfinance for Sanitation in Tanzania." WaterAid.

Trémolet, Sophie, Goufrane Mansour, and George Muruka. 2015. "Microfinance for Sanitation: What Is Needed to Move to Scale?" *Waterlines* 34 (3): 227–40. <https://doi.org/10.3362/1756-3488.2015.022>.

TU Delft. n.d. "Branding & Business Modeling."

TU Delft. n.d. "User Experience & Engagement."

UN. 2002. "A Framework for Action on Water and Sanitation."

UNDP. 1991. "Capacity Building Water Resources for Management."

UNDP. n.d. "Action Research - Meeting the Infrastructure Needs of the Informal Sector through Microfinance In Urban India." WSP.

UNDP, and WSP. 2005. "Building Capacity for Sanitation." WSP.

UN-HABITAT. 2003. "The Challenges of Slums: Global Report on Human Settlements."

UNICEF. 2011. "Community Water and Environmental Sanitation for South Africa's Unserved." UNICEF.

UNICEF. 2010. "Sanitation Marketing in Indonesia: Challenges and Response."

University College London. n.d. "Modelling the next Generation of Sanitation Systems."

University College London, and IFAK. n.d. "NewSan Prototype Simulator Modelling the Next Generation of Sanitation Systems."

USAID. n.d. "Citywide Approach for Sanitation: A Path for Improving Management of Urban Sanitation." USAID.

USAID. 2010. "Sanitation Marketing for Managers: Guidance and Tools for Program Development." Washington, DC: USAID.

USAID. 2015. "Senegal Water and Sanitation Profile."

USAID. 2008. "Sanitation Consultation: Summary Notes." In USAID Sanitation Consultation. Washington DC: USAID.

USAID. 2018. "Adaptive Management." Discussion Note. Washington DC: USAID.

USAID. 2010. Peru: Case studies in sanitation microfinance.

USAID, and Plan Uganda. 2010. "A Sanitation Marketing Strategy for Tororo District, Uganda." [http://www.hip.fhi360.org/file/27662/Sanitation Marketing Strategy for Tororo District Uganda - March 2010.pdf](http://www.hip.fhi360.org/file/27662/Sanitation%20Marketing%20Strategy%20for%20Tororo%20District%20Uganda%20-%20March%202010.pdf).

Ushijima, Ken, Naoyuki Funamizu, and M Yokota. 2012. "Value Network Design Approach for Sanitation System in Developing Countries - Lessons from Two Japanese Models -." In 4th International Dry Toilet Conference.

Valfrey-Visser, Bruno, and David Schaub-Jones. 2009. "Supporting Private Entrepreneurs to Deliver Public Goods: Engaging Sanitation Entrepreneurs." In 34th WEDC International Conference. Addis Ababa, Ethiopia.

Daalen, Tettje Van. 2012. "Market Assessment." IRC International Water and Sanitation Centre. 2012.

Daalen, Tettje Van. 2005. "Financing Options." IRC International Water and Sanitation Centre. 2005.

Wel, A van der, E Bereziat, Gert de Bruijne, and J Barendse. 2010. "Financing the Informal Entrepreneur: Recognizing Business Opportunities in Sanitation." Sustainable Sanitation Practice, no. 5.

Varley, R C G. 1995. "Financial Services and Environmental Health: Household Credit for Water and Sanitation." Washington DC: USAID.

Vasquez, Alfonso. 2008. "Private Participation." In Unlocking the Potential of the Domestic Private Sector in Water and Sanitation Services. London, UK.

Velasco Sayre, Elmer, Christian Zayas, and Jed Christian Z Sayre. 2011. "Sanitation Solutions for Flooded Zones: The WAND Foundation Experience."

Velkushanova, Konstantina. 2015. "Properties of Faecal Sludge from Different on-Site Sanitation Facilities in Durban, South Africa." University of Kwazulu-Natal.

VIHEMA, Health Department - Hoa Binh, and WSP. n.d. "Training Manual on Sanitation Marketing for Sales Agents."

Visionfund Cambodia. n.d. "WaterSHED - VisionFund Cambodia." Accessed March 31, 2018. <http://www.visionfund.com.kh/watershed>.

Münch, E. von, and R. Ingle. 2012. "Compilation of 25 Case Studies on Sustainable Sanitation Projects from Africa." Sustainable Sanitation Alliance.

Münch, Elisabeth von. n.d. "Financial Aspects and Market Considerations." UNESCO-IHE.

- Waal, Dominick De, and Max Hirn. 2015. "The Intricacies of Attracting and Sustaining Investment in WASH in Fragile States Lessons from Liberia." WSP.
- Wafler, Martin, Johannes Heeb, and Annick Staub. 2009. "Pour-Flush Toilets with Biogas Plant at DSK Training Institute, Gujarat, India - Draft." Sustainable Sanitation Alliance.
- Wagle, Narayan Prasad, and Chandra Bhakta Bista. 2015. "Reaching the Mountain for Solution: Sustainable Dry Sanitation Practices." In 5th International Dry Toilet Conference.
- Waldorf, A. 2012. "Assessing the Role of Women in Microfinance for Water Supply and Sanitation Services." Philadelphia, Pennsylvania: University of Pennsylvania, Department of Earth and Environmental Studies.
- WASHPlus. 2010. "Dry Sanitation System for Cape Town's Informal Settlements." Sanitation Updates. 2010.
- Water For People. n.d. "Sanitation as a Business: Clearing the Path for Change."
- Water For People. n.d. "Sanitation as a Business: One Strategy to Achieve Sustainable Sanitation."
- Water For People. n.d. "Strengthening Public Sector Enabling Environments to Support Sanitation Enterprises."
- Water For People. 2014. "Sanitation Business Catalogue: Let's Rapidly Scale Sanitation Services to the Poor!"
- Waterkeyn, Juliet, and Sandy Cairncross. 2015. "Creating Demand for Sanitation and Hygiene through Community Health Clubs: A Cost-Effective Intervention in Two Districts in Zimbabwe." *Social Science & Medicine* 61 (2005): 1958–70.
- WaterSHED Cambodia. 2013. "Microfinance Boosts Latrine Purchases in Rural Cambodia Rural Consumer Sanitation Adoption Study in Cambodia." 2013.
- WaterSHED Cambodia. 2011. "Hands-Off Sanitation Marketing."
- WaterSHED Cambodia. n.d. "Sanitation Marketing: Quick Facts."
- WBCSD. n.d. "Water, Sanitation, and Hygiene at the Workplace."
- Webster, Mike, and Kevin Sansom. 1999. "Public-Private Partnership and the Poor: An Initial Review." London School of Hygiene & Tropical Medicine; WEDC.
- Weglin-Schuringa, Madelin, and Ousseynou Guène. 2002. "Evaluating Rural Latrines in Guinea, 1998-2011." UNICEF.
- Wei, Yi, Tamara Baker, Michael Roberts, Stu Taylor, and Veasna Toe. 2014. "Sanitation Marketing Scale-Up (SMSU 1.0) - End of Project Report." iDE.
- Weitz, Almud. n.d. "Scaling Up Rural Sanitation in Indonesia." WSP.
- Weitz, Almud. 2008. "Urban Sanitation Planning and Development." In Stockholm World Water Week. Stockholm, Sweden.
- Wendland, Claudia, Irene Dankelman, Cecilia Ruben, Isabelle Kunze, Marni Sommer, and Doreen Mbalo. 2012. "Integrating a Gender Perspective in Sustainable Sanitation." Sustainable Sanitation Alliance.

- Werner, Christine, Florian Klingel, Patrick Bracken, Jana Schlick, Tim Freese, Wang Rong, and Stefan Hofstetter. 2009. "Peri-Urban Urine Diversion Dehydration Toilets (Abandoned), Koulikoro, Mali - Draft." Sustainable Sanitation Alliance. Sustainable Sanitation Alliance.
- White, Pamela. 2017. "Workshop - Solutions to Cultural Challenges and Stigmatization (Incl. Disabilities) of Dry Sanitation." In 5th International Dry Toilet Conference.
- White, Zach, and Peter Burr. n.d. "Value for Money Study in Global Sanitation Fund Programmes – Synthesis Report." WSSCC.
- WHO/UNICEF. 2015. "Progress on Sanitation and Drinking Water - 2015 Update and MDG Assessment." <https://doi.org/10.1007/s13398-014-0173-7.2>.
- Wicken, James. 2012. "Effectiveness of a Sanitation Marketing Approach in Rural Papua New Guinea: The ATProjects Round Loo Programme." Loughborough University.
- Willetts, Juliet, James Wicken, and Andy Robinson. 2008. "Meeting the Sanitation and Water Challenge in South-East Asia and the Pacific." In Sanitation and Water Conference. Melbourne, Australia.
- Williams, Susana Rojas, and John Sauer. 2014. "Unclogging the Blockages in Sanitation: Inter-Sector Linkages." *Waterlines* 33 (3): 18–20. <https://doi.org/10.3362/2046-1887.2014.022>.
- Winara, Asep, Guy Hutton, Edi Purnomo Oktarinda, Koderi Hadiwardoyo, Indon Merdykasari, Takdir Nurjadi, Bert Bruinsma, Dedek Gunawan, Dadang Fadilah, and Martin Albrecht. 2011. "Economic Assessment of Sanitation Interventions in Indonesia A Six-Country Study Conducted in Cambodia, China, Indonesia, Lao PDR, the Philippines and Vietnam under the Economics of Sanitation Initiative (ESI)." WSP.
- Winkler, Martina, and Amel Saadoun. 2011. "Urine and Brownwater Separation at GIZ Main Office Building Eschborn, Germany." Sustainable Sanitation Alliance.
- Winrock. 2007. "Biogas for Better Life: An African Initiative a Cost-Benefit Analysis of National and Regional Integrated Biogas and Sanitation Programs in Sub-Saharan Africa."
- Woods, Emily, Mona Mijthab, Hana Lokey, Andrew Foote, and Christian Rieck. 2013. "Sanivation and Mosan Toilet 4 Week Service Pilot." GIZ.
- World Bank. 2015. "Water Supply and Sanitation in Indonesia: Turning Finance into Services for the Future."
- World Bank. 1999. "Meeting the Infrastructure Needs of the Informal Sector through Microfinance in Urban India."
- World Bank. 2016. "Case Studies in Blended Finance for Water and Sanitation."
- World Bank. 2014. "Results Based Financing for Sanitation and Hygiene (PI44476) Implementation Status & Results Report."
- World Bank. 2008. "Water and Sanitation Program FY 09-11 Business Plan."
- World Bank. 2011. "Getting Africa to Meet the Sanitation MDG: Lessons from Rwanda."
- World Bank. 1998. "Community Water Supply and Sanitation Conference." In Community Water Supply and Sanitation Conference. Washington DC: World Bank.

World Bank. 2015. "Water Supply and Sanitation in the Philippines: Turning Finance into Services for the Future."

World Bank. 2004. "Monitoring and Evaluation: Some Tools, Methods, and Approaches."

World Bank. 2002. "Willingness to Charge and Willingness to Pay: The World Bank - Assisted China Rural Water Supply and Sanitation Program."

World Bank. 2003. "Water, Sanitation & Hygiene at a Glance."

World Bank. 2004. "Public and Private Sector Roles in Water Supply and Sanitation Services."

World Bank. 2015. "Water Supply and Sanitation in Cambodia: Turning Finance into Services for the Future."

World Bank, WSP, and World Bank. 2015. "Water Supply and Sanitation in Papua New Guinea: Turning Finance into Services for the Future."

WRC. 2003. "Water Research Commission Sanitation Research Strategy." Waste Management.

Wright, Albert M. 1997. "Toward a Strategic Sanitation Approach: Improving the Sustainability of Urban Sanitation in Developing Countries." WSP.

WSP. 2013. "Pathways to Success: Compendium of Best Practices in Rural Sanitation in India."

WSP. 2004. "Guidelines for Sector Reform and Successful Public-Private Partnerships."

WSP. n.d. "Conducting Formative Research: Introductory Guide to Sanitation Marketing."

WSP. 2011. "Establishment and Management of Community Sanitary Complexes in Rural Areas."

WSP. 2000. "Microfinance for Infrastructure: Recent Experiences."

WSP. 2008. "FAQs: Rural Sanitation and Hygiene Practices."

WSP. 2009. "Market Research Assessment in Rural Tanzania for New Approaches to Stimulate and Scale up Sanitation Demand and Supply."

WSP. 2012. "Scaling Sanitation Does Not Work, Unless Matchmaking: Think Global, Act Local."

WSP. 2009. "A Participatory Model for Low-Cost Sanitation."

WSP. 2011. "The Political Economy of Sanitation: How Can We Increase Investment and Improve Service for the Poor?"

WSP. 2008. "Domestic Private Sector Participation: Senegal."

WSP. 2001. "Managing the Process and Regulating the Sector: Nagari." In 13th Meeting of the Urban Think Tank. Manesar, India.

WSP. 2002. "Learning What Works for Sanitation: Revisiting Sanitation Successes in Cambodia."

WSP. n.d. "Introductory Guide to Sanitation Marketing: Marketing Mix: Place."

WSP. n.d. "Developing a Communication Campaign."

WSP. 2002. "Water and Sanitation Program End of Year Report FY08."

- WSP. n.d. "What Is Sanitation Marketing? Introductory Guide to Sanitation Marketing."
- WSP. 2008. "Water and Sanitation Program FY08 Progress Report."
- WSP. 1995. "Guidelines on Community Toilets."
- WSP. 2008. "Water and Sanitation Program FY2009-2018 Global Strategy: Scaling up Sustainable Services."
- WSP. 2005. "Scaling-Up Rural Sanitation in South Asia."
- WSP. 2014. "What Works at Scale? Distilling Critical Success Factors in Scaling up Rural Sanitation."
- WSP. 2005. "The Domestic PSP Initiative."
- WSP. 2014. "Water Supply and Sanitation in Vietnam: Turning Finance into Services for the Future."
- WSP. 2000. "New Approaches to Promoting Sanitation in Rural Bangladesh."
http://www.iewater.net/resources/Issues/SanMark/SanMark_Bangladesh.pdf.
- WSP. 2010. "Water Supply and Sanitation in Mozambique: Turning Finance into Services for 2015 and Beyond."
- WSP. n.d. "Introductory Guide to Sanitation Marketing: Marketing Mix: Product."
- WSP. 2007. "Public Toilets in Urban India: Doing Business Differently."
- WSP. 2007. Taking Water and Sanitation Services to the Urban Poor.
- WSP. 2013. "Impact Evaluation of a Large-Scale Rural Sanitation Project in Indonesia."
- WSP. 1999. "Private Sector Participation in Provision of Water and Sanitation Services to the Urban Poor." Chennai.
- WSP. 2001. "The Reform of the Water Supply and Sanitation Sector in Africa."
- WSP. 2013. "Making Sanitation Marketing Work The Bangladesh Story."
- WSP. 2003. "FY11-15 Business Plan Water and Sanitation Program."
- WSP. 2015. "Water Service Provider Toolkit for Commercial Financing of the Water and Sanitation Sector in Kenya."
- WSP. n.d. "Introductory Guide to Sanitation Marketing: Marketing Mix: Price."
- WSP. 1990. "Workshop on Goals and Indicators for Monitoring and Evaluation for Water Supply and Sanitation." In Workshop on Goals and Indicators for Monitoring and Evaluation for Water Supply and Sanitation. Geneva, Switzerland.
- WSP. 2012. "Economic Assessment of Sanitation Interventions in Cambodia: A Six-Country Study Conducted in Cambodia, China, Indonesia, Lao PDR, the Philippines and Vietnam under the Economics of Sanitation Initiative (ESI)."
- WSP. 2010. "Mainstreaming Gender in Water and Sanitation Gender in Water and Sanitation."
- WSP. 2014. "FY12 Highlights of Results East Asia and the Pacific."
- WSP. 2015. "Water and Sanitation Program FY09 End of Year Report."

WSP. 2015. "Water and Sanitation Program FY10 End of Year Report."

WSP. 2015. "Lender's Manual for Commercial Financing of the Water and Sanitation Sector in Kenya."

WSP. 2016. "Community Slum Sanitation in India: A Practitioner's Guide."

WSP. 2015. "Sri Lanka's Water Supply and Sanitation Sector: Achievements and a Way Forward."

WSP. 2009. "Strategic Guidelines for Improving Water and Sanitation Services in Nairobi's Informal Settlements."

WSP. n.d. "WSP South Asia Results for FY2013 and Expectations for FY2014 What the Government Did What WSP Did to Support the Government."

WSP. 2011. "Economic Assessment of Sanitation Interventions in Vietnam A Six-Country Study Conducted in Cambodia, China, Indonesia, Lao PDR, the Philippines and Vietnam under the Economics of Sanitation Initiative (ESI)."

WSP. 2007. "Business Plan Water and Sanitation Program Fiscal Year 2007."

WSP. 1999. "Empowerment through Entrepreneurship in Water and Sanitation."

WSP. 2007. "Economics of Sanitation Initiative: Poor Sanitation Costs Indonesia Over Rp 58 Trillion Per Year."

WSP. 2015. "Water and Sanitation Program End of Year Report, Fiscal Year 2014."

WSP. 2009. "Global Experiences on Expanding Water and Sanitation Services to the Urban Poor."

WSP. 2004. "The World Bank Group's Program for Water Supply and Sanitation."

WSP. 2014. "Creating Sustainable Services Through Domestic Private Sector Participation (DPSP)."

WSP. 2015. "Water Supply and Sanitation in Zimbabwe: Turning Finance into Services for 2015 and Beyond."

WSP. n.d. "Water and Sanitation Program FY12 End of Year Report."

WSP. 2008. "The Water and Sanitation Program: Medium-Term Strategic Framework on Sanitation."

WSP. 2008. "Water and Sanitation Program (WSP) Action Plan to Support the International Year of Sanitation (IYS) Objectives."

WSP. 2007. "East Asia and the Pacific FY08 Achievements."

WSP. n.d. "WSP FY11-15 Business Plan Update."

WSP. 2008. "Economic Impacts of Sanitation in Indonesia: A Five-Country Study Conducted in Cambodia, Indonesia, Lao PDR, the Philippines, and Vietnam under the Economics of Sanitation Initiative (ESI)."

WSP. 2009. "Update on WSP Activities to Support International Year of Sanitation September 2009."

WSP. 2002. "Water and Sanitation Program 99-00 Report."

WSP. 2002. "Water and Sanitation Program End of Year Report, Fiscal Year 2015."

WSP. 2002. "Selling Sanitation in Vietnam: What Works?"

WSP - Tanzania. n.d. "Training of Trainers Manual on Sanitation Marketing Community-Led Total Sanitation Handwashing with Soap."

WSP, AMCOW, and African Development Bank. 2008. "Can Africa Afford to Miss the Sanitation MDG Target ? A Review of the Sanitation and Hygiene Status in 32 Countries."

WSP, and Government of India. 2008. "Technology Options for Urban Sanitation in India."

WSP, and UNICEF. 2015. "Water Supply and Sanitation in Ghana: Turning Finance into Services for 2015 and Beyond."

WSP, VIHEMA, and Health Department - Hoa Binh. n.d. "Training Manual for One-Stop-Shop."

WSSCC. 2016. "Medium-Term Strategic Plan 2012-2016."

WSSCC. 2016. "Catalytic Programming for Scale & Sustainability." In Global Sanitation Fund Learning Event.

WSSCC. 2007. "2007 Annual Report Water Supply & Sanitation Collaborative Council." WSSCC.

WSSCC. 2016. "Changing Hearts and Minds to Leave No One behind." In Sanitation Action Summit. Mumbai, India: WSSCC.

WSSCC. 2014. "Meeting Report." In Advocacy, Communications and Monitoring of WASH Commitments Workshop. Cotonou, Benin.

WSSCC. 2010. "The Road to Total Sanitation: Notes from a Field Trip and Workshop on Scaling up in Africa."

WSSCC. n.d. "The Heart of a Global Movement to Improve Sanitation for Everyone."

WSSCC. n.d. "The Evidence Programme on Sanitation and Hygiene."

WSSCC. 2008. "Annual Report 2008."

WSSCC. 2009. "Water Supply and Sanitation Collaborative Council Annual Report 2010."

WSSCC. n.d. "WSSCC Management Response to the Global Sanitation Fund Independent Mid-Term Evaluation Synthesis Report."

WSSCC, IWA, and WHO. 2013. "The Convening Power of Risk: A Community of Practice Event on Urban Sanitation and Sanitation Safety Planning." In A Community of Practice Event on Urban Sanitation and Sanitation Safety Planning. Nairobi, Kenya: WSSCC.

WSSCC, and UN Women. 2014. "Menstrual Hygiene Management: Behaviour and Practices in the Louga Region, Senegal."

WSUP. 2012. "Financing Water and Sanitation for the Poor: Six Key Solutions." The Hague, The Netherlands: IRC.

WSUP. 2013. "Four Innovative Sanitation Projects in Zambia."

Yacoob, May, and Robert W. Porter. 1988. "Social Marketing and Water Supply and Sanitation: An Integrated Approach." WASH Field Report. USAID.

Yishay, Ariel Ben, Andrew Fraker, Raymond Guiteras, Giordano Palloni, Neil Buddy Shah, Stuart Shirrell, and Paul Wang. 2017. "Microcredit and Willingness to Pay for Environmental Quality: Evidence from a Randomized-Controlled Trial of Finance for Sanitation in Rural Cambodia." *Journal of Environmental Economics and Management*, November, 20 pp. <https://doi.org/10.1016/j.jeem.2016.11.004>.



FSG

U.S. Agency for International Development
1300 Pennsylvania Avenue, NW
Washington, DC 20523
Tel: (202) 712-0000
Fax: (202) 216-3524
www.usaid.gov