

Review of Rural Sanitation Approaches

Final Report

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Abbreviations and Acronyms

BCC	Behavior Change Communication
CHAST	Child Hygiene and Sanitation Training
CATS	Community Approaches to Total Sanitation
CHC	Community Health Clubs
CLTS	Community-led Total Sanitation
DMS	Developing Markets for Sanitation
MFI	Microfinance Institution
NGO	Non-Governmental Organization
ODF	Open defecation-free
OBA	Output-based Aid
PHAST	Participatory Hygiene and Sanitation Transformation
SAAB	Sanitation as a Business
SaFPHHE	Sanitation Focused Participatory Health and Hygiene Education
SanMark	Sanitation Marketing
SLTS	School-led Total Sanitation
SDG	Sustainable Development Goals
SBM	Swachh Bharat Mission
TSSM	Total Sanitation and Sanitation Marketing
UNC	University of North Carolina
UNICEF	United Nations Children’s Fund
WaSH	Water, Sanitation, and Hygiene
WHO	World Health Organization

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Executive Summary

International donors, non-governmental organizations, and governments have invested considerable resources into improving access to safe and affordable rural sanitation services. This effort has resulted in a wide range of approaches that target awareness generation, behavior change, and supply and demand for sanitation. However, there is significant variation in programming within and across organizations, programs, and national campaigns. Therefore, Plan International USA, WaterAid, and UNICEF began a joint project to review and consolidate existing evidence and experience on different rural sanitation approaches, with the aim of developing guidance documents for policy-makers, planners and implementers. As part of this project, The Water Institute at UNC was commissioned to review and characterize rural sanitation approaches.

This report maps out the predominant rural sanitation approaches, and analyzes and compares their core elements, attributes and activities. A rapid literature review was conducted, supported by key informant interviews with rural sanitation experts.

The following predominant approaches were identified and grouped based on their primary focus area:

- promoting sanitation and hygiene **behavior change** through community mobilization methods
 - Participatory Hygiene and Sanitation Transformation (PHAST)
 - Child Hygiene and Sanitation Training (CHAST)
 - Community Health/Hygiene Clubs (CHC)
 - Community-led Total Sanitation (CLTS)
 - School-led Total Sanitation (SLTS)
- developing or strengthening the **market** and **supply-chain** for sanitation technologies
 - Sanitation as a Business (SAAB)
 - Sanitation Marketing (SanMark)
 - Developing Markets for Sanitation (DMS)
- providing **financing mechanisms** to improve sanitation supply and demand
 - Sanitation microfinance
 - Targeted hardware subsidies prior to construction
 - Output-based Aid (OBA)¹

In practice, approaches may be adapted to include all three focus areas in different contexts. A comparison of the main attributes revealed considerable overlap across approaches as well as key differences.

An activity-based framework was then developed to compare programming across different approaches. Activities typically conducted in rural sanitation projects were grouped into seven categories: planning and training; formative assessments; community interaction; supply chain networks; technology and construction; financing; and monitoring and evaluation.

Based on an analysis of similarities, differences, strengths, and weaknesses of the core attributes and activities, five main considerations for compatibility are proposed:

1. **There are fundamental differences in philosophy across approaches regarding perception of the individual, household, or community as a “beneficiary” or as a “customer.”** These

¹ Note that in the discussion brief (<https://washmatters.wateraid.org/Rural-San>) related to this report, the names of these groupings have been slightly modified.

differences not only affect the potential to combine or sequence approaches, but also the ability to equitably reach the most vulnerable households in communities. However, most of these approaches are highly flexible in theory and practice, which indicates the potential for adapting perspectives depending on the context. Practitioners looking to combine approaches will need to agree upon the theory of change and philosophy in advance to ensure compatibility.

2. **There are basic differences in the population and targets, but these should not affect compatibility across approaches, as outcome measures can and should be combined to achieve end goals.** Whether the aim is to achieve ODF status or an incremental increase in latrine coverage and sales, practitioners of all approaches ultimately need individuals to act for the intervention to be successful. The difference is not in the target population or goal, but rather in the method of individual action, be it contributing to latrine construction or financing (targeted subsidy, OBA), building one's own latrine (CLTS, SLTS), or purchasing a latrine with cash or loans (market-based, microfinance).
3. **Planning and training activities can be coordinated when combining or sequencing demand- and supply-related activities across approaches.** Activities such as training, baseline assessments and routine follow-up activities all require motivated team members, sufficient financing, and adequate planning. Combining approaches can provide an opportunity to jointly coordinate training and engagement of different actors who will play a key role at various stages of sanitation interventions.
4. **Differences in behavior change techniques and drivers will influence the compatibility and adaptation of specific approaches.** The need for community participation underscores all approaches, but the particular behavior change techniques may vary across approaches. Different contexts will require the use of different behavior change techniques, which can be best identified by incorporating the vast formative research toolkit from market-based approaches into all rural sanitation programming.
5. **Practitioners can capitalize on supply and demand-based strengths of different approaches.** Although all practitioners agree that supply and demand matter in any intervention, differences arise in the perceived role of the implementer in providing technical support and financing to individuals. Fundamental differences may exist, such as the inconsistency between providing targeted subsidies prior to construction and the principles of CLTS, SLTS, and CHCs. However, behavior change approaches can still be combined in different contexts with market-based, microfinance or OBA approaches to ensure that individuals who want to change their behavior can purchase durable and desirable latrines at different price points.

1. Introduction

International donors, non-governmental organizations, and governments have invested considerable resources into improving access to safe and affordable rural sanitation services. This effort has resulted in the development and implementation of a wide range of rural sanitation approaches targeting awareness generation, behavior change, and supply and demand.

There is significant variation in programming within and across organizations, programs, and national campaigns. While some tend to adhere to one specific approach, others combine a variety of activities across different “labeled” approaches. Furthermore, definitions are not standardized, making it challenging to understand similarities and differences.

Plan International USA, WaterAid, and UNICEF began a joint project to review and consolidate existing evidence and experience on different rural sanitation approaches, with the aim of developing guidance documents for policy-makers, planners and implementers. As part of this project, The Water Institute at UNC was commissioned to review and characterize rural sanitation approaches. This report describes findings from the desk review.

2. Purpose

The purpose of this review was to map out approaches that have recently dominated rural sanitation implementation and analyze the core elements, strengths and weaknesses, and similarities and differences across approaches. By identifying and comparing key attributes and activities, the review will contribute to the development of future guidance on costing of rural sanitation and sequencing or combining approaches. It is intended to help practitioners and policymakers make informed decisions about rural sanitation programming approaches.

3. Methods and Analysis

A desk review was conducted of manuals from predominant approaches, project documents and case studies from a variety of water, sanitation and hygiene (WaSH) organizations, and systematic reviews on sanitation. Key informant interviews were conducted with 12 representatives from WaSH organizations, as well as independent rural sanitation experts (Appendix 1). Interviews were conducted to gain a better understanding of variations in activities, as well as perspectives on the current state of rural sanitation programming.

The main approaches were grouped based on their primary focus areas, and core elements of each approach were compared. Focus areas were determined through a review of the literature and were confirmed in interviews with experts. Through the interviews and a close reading of project reports, project activities were identified and grouped to analyze similarities and differences across approaches. An activity-based framework was developed for analysis.

4. Limitations

The approaches that follow are broadly representative of rural sanitation programming to enable a comparison of the main attributes and activities that can inform upcoming guidance on more holistic and flexible rural sanitation strategies. It was not possible to capture every labeled approach; furthermore, the review does not outline approaches based entirely in extra-household settings such as in schools and health care facilities, or approaches focusing more broadly on handwashing promotion or menstrual hygiene management.

While it was not possible to thoroughly document the geographic scope of the approaches and their adaptations, certain geographic trends are noted in Section 5.15. There is also considerable variation in implementation within approaches, and this review was only able to capture key components to enable a broad comparison. It was beyond the scope to document the breadth of implementation arrangements, but the main actors typically involved in different approaches are documented.

5. Findings

The report is structured as follows:

- Section 4.1 introduces the approaches and their main characteristics.
- Section 4.2 compares the approaches using an activity-based framework.
- Section 4.3 outlines the main strengths and weaknesses of the approaches.

Section 5 then discusses potential compatibility across the included approaches based on similarities and differences.

5.1. Overview of rural sanitation approaches

Approaches were grouped based on whether they were primarily—but not always exclusively—designed to:

- a) drive sanitation and hygiene **behavior change** at the household or community level through educational or community mobilization methods
- b) focus on developing or strengthening the **market**² and **supply-chain** for sanitation technologies
- c) develop or provide **financing mechanisms** for households and businesses to improve sanitation supply and demand

Some behavior change approaches are commonly referred to in the literature as “demand-driven” or “demand-led,” while market-based approaches are referred to as “supply-side.” Findings suggest that the distinction is less between supply and demand and more in the aspects of the “system” or “sanitation value chain” that different approaches target.

Table 1 and Table 2 outline the main characteristics of these approaches. A summary is provided below.

5.1.1 Community-based behavior change approaches

All approaches listed below are participatory in nature, and range from providing education to efforts that channel positive and negative peer pressure or influence to change behavior.

Participatory Hygiene and Sanitation Transformation

Participatory Hygiene and Sanitation Transformation (**PHAST**) is a “decision-support tool” to improve hygiene and sanitation behavior, reduce diarrheal disease, and encourage community management of water and sanitation services [17]. Developed by the World Bank and the World Health Organization (WHO) in the early 1990s, it comprises a seven-step process of identifying and analyzing a problem, planning solutions, selecting options, constructing facilities, promoting behavior change, monitoring and evaluating activities, and conducting a participatory evaluation [28]. The approach was first piloted in southern and eastern Africa, and has been used to a lesser extent around Asia and Latin America. Similarly, Child Hygiene and Sanitation

² A market in this context refers to a system where buyers and sellers can interact to facilitate an exchange.

Training (**CHAST**) was adapted from PHAST in Somalia, and uses educational games to generate hygiene and sanitation awareness in children [11].

Community Health Clubs

Community Health Clubs or Community Hygiene Clubs (**CHCs**) are community organizations formed to promote family health and sanitation through weekly meetings on different health and hygiene topics. These meetings are run by trained facilitators from the community or by trained government health extension workers over the course of six months. Peer pressure or social pressure and competition is used to convince participating households to build latrines and improve other WaSH and health behaviors. The approach was piloted in Zimbabwe by AfricaAhead and is found mainly in southern Africa, Rwanda (where it is part of national policy), and the Dominican Republic [35].

Community-led and School-led Total Sanitation

Community-led Total Sanitation (**CLTS**) was developed in Bangladesh to trigger collective change at the community level using participatory methods to incite disgust at open defecation. Communities are expected to build sanitation facilities on their own using locally available materials in order to be declared as open defecation-free (ODF) [12]. School-led Total Sanitation (**SLTS**) uses participatory triggering tools similar to CLTS but focuses on the school catchment area rather than individual communities [29]. CLTS and SLTS are arguably the most common set of approaches in use, with a number of documented adaptations and variations within and across organizations [33, 34].

5.1.2 Market-based approaches

Sanitation market-based approaches focus on strengthening and building capacity in different steps of the sanitation supply chain or value chain. Practitioners are guided by the business principles of maximizing profit and of market efficiency. Individuals are viewed as customers rather than beneficiaries. Target areas are generally wide to ensure market mechanisms can function efficiently; typically, this means that a district-wide target area is preferred, but success is measured by the number of households (customers) purchasing and using latrines. Market-based approaches also explicitly target suppliers and businesses [18]. Sanitation market-based approaches have been trialed more so in South and Southeast Asia and parts of Latin America, but attempts to develop markets for sanitation in Africa are growing [23].

These approaches are known by several names, including:

- Sanitation as a Business (**SAAB**): typically referring to micro-enterprises
- Sanitation Marketing (**SanMark**): inclusion of wider social and commercial marketing strategies to sanitation
- And more recently, Developing Markets for Sanitation (**DMS**): referring to a systems approach to the market for sanitation. [37]

The literature review and interviews with experts suggested that sanitation market-based approaches do not have a prescriptive set of activities or a standard manual, but are largely guided by similar principles [37]. Therefore, these labeled approaches were not disaggregated in this report and are hereafter referred to as market-based approaches. Note, however, the variation between and within labeled approaches and organizations implementing them.

5.1.3 Financing approaches

Financing approaches can include provision of loans prior to construction; partial or full provision of cash or materials prior construction; or partial or full provision of cash or materials to reimburse costs after construction.

Sanitation microfinance

Microfinance approaches engage microfinance institutions (**MFIs**) to leverage loans for lower-income rural households or small businesses to help generate demand and improve supply-side conditions for sanitation. Various loan products may be available, including individual and group loans, promoted by credit officers to businesses and to rural households. Sanitation microfinance approaches have not yet been implemented extensively, but examples have emerged from South and Southeast Asia, and selected countries in Africa [4]. MFIs are typically identified following, or in conjunction with, market-based approaches.

Targeted hardware subsidies prior to construction

Several national governments provide **targeted hardware subsidies** (direct cash transfers or subsidized material) to ultra-poor segments of rural communities to enable construction of facilities [2, 10]. These subsidies are often provided as part of larger programs and may be implemented alongside behavior change approaches.

International or local NGOs may also support household latrine construction through partial or complete subsidies. Prominent charity efforts that only consist of direct construction of sanitation facilities for rural households have become increasingly rare, but such programs still exist by way of smaller missions. They have been included to indicate that such approaches still exist and can influence the acceptance and success of the approaches in target communities that may have developed an expectation of external charity support due to these programs. It is more common to find organizations or programs including subsidies as part of their overall sanitation strategy.

Output-based Aid

Output-based Aid (**OBA**) is a type of financial rebate scheme, conditional cash transfer, or targeted subsidy that ties donor or government funds to performance. This approach has been used for demand promotion activities as well as latrine construction [20]. The aim is to incentivize households, suppliers (private sector), and implementing agencies to be innovative and efficient [32]. OBA is not the same as rewards that may be given to communities for meeting certain sanitation goals or to facilitators to foster competition. Subsidies must be pre-determined and explicitly defined, and payment to implementers is provided only on delivery of outputs such as number of communities triggered, number of latrines built or number of ODF communities. Subsidies or rebates are typically provided to the poorest households as incentives to move up the sanitation ladder. The scope of this approach has been limited so far, with examples primarily from Southeast Asia [14, 20, 32].

5.1.4 Note on rural sanitation programs

Programs implemented by large external agencies or by national governments often involve a combination of the approaches listed above. For example, Community Approaches to Total Sanitation (**CATS**) is an umbrella term coined by UNICEF in 2008 that emphasizes community leadership in decision making. CATS programs can include CLTS, SLTS, supply-side approaches including subsidies, and activities to improve the enabling environment [9]. Another example is The World Bank's Total Sanitation and Sanitation Marketing (**TSSM**) program in India, Indonesia, and Tanzania, which combined CLTS and sanitation marketing, and efforts to improve the enabling environment [22].

Government campaigns also often involve several approaches. Examples include the Government of India's Swachh Bharat Mission (**SBM**)—previously called the Nirmal Bharat Abhiyan and Total Sanitation Campaign—which includes educational activities, CLTS-like behavior change activities, and post-construction hardware subsidies [10]. In Zimbabwe, the Sanitation Focused Participatory Health and Hygiene Education (SaFPHHE) program combines

the government-prescribed latrine technology, CLTS, PHAST, and CHCs [2]. Such large-scale sanitation programs are not detailed in this report, but their component parts have been analyzed at length.

Table 1. Primary goals, methods and outcome measures of rural sanitation approaches

Approach	Primary sanitation-related goal	Implementation method	Primary outcome measure
PHAST [17], CHAST [11]	Increase latrine coverage and improve hygiene practices	Participatory community mobilization through hygiene and sanitation education	Change in household latrine coverage
CHCs [35]	Increase latrine coverage and improve hygiene practices	Participatory community mobilization through hygiene and sanitation education and peer pressure	Change in household latrine coverage
CLTS [12], SLTS [29]	End open defecation	Participatory community mobilization through peer pressure	Achieving ODF status
SanMark, SAAB, DMS [18, 23, 37]	Increase latrine coverage	Developing and strengthening supply chain and market	Change in household latrine sales
Sanitation microfinance [4]	Increase latrine coverage	Improving financing options through loans for households and sanitation service providers	Repayment of loans
Targeted hardware subsidies prior to construction [2,10]	Increase latrine coverage	Providing partial or full financing or in-kind donation for sanitation infrastructure	Change in household latrine coverage
OBA [32]	Increase latrine coverage	Targeted rebates to households or service providers	Change in household latrine coverage

Note: The information in this table is sourced from documents that describe the approaches, and does not reflect variations in practice.

5.1.5 Note on geographic scope

CLTS is arguably the most widely used of these approaches, with a systematic review documenting its presence in at least 53 countries [34]. It began in Bangladesh, spread around South and Southeast Asia, and is now implemented across Sub-Saharan Africa and a handful of countries in Latin America and the Caribbean. Market-based approaches and microfinance are increasingly popular, but most examples were found from Southeast and South Asia [8, 19, 26, 27, 30, 36, 38], with a few examples emerging from Africa [15, 24, 25, 31]. Targeted hardware subsidies prior to construction are still found in many government policies.

Other approaches are still limited in scope. CHCs are found primarily in Zimbabwe, Rwanda, and the Dominican Republic. A few examples of OBA approaches have emerged from Southeast Asia [13]. PHAST/CHAST and similar educational approaches have largely gone out of favor, although PHAST is still a core part of government policy in some southern African countries (e.g. Swaziland, Lesotho). Relevant PHAST tools appear to have been incorporated into CLTS or other behavior change communication (BCC) strategies in market-based approaches [17].

Further research is needed to understand why certain approaches have been scaled-up while others have remained limited in scope. This understanding will contribute to guidance on combining and sequencing approaches in different contexts.

Table 2. Main characteristics of rural sanitation approaches

Approach	Focus ¹			Target population			Behavior change driver		
	Generating demand	Strengthening supply chain	Financing	Household	Community	Service providers	Education	Peer/social pressure ²	Social marketing
PHAST CHAST									
CHCs									
CLTS SLTS									
SanMark, SAAB, DMS									
Sanitation microfinance							No explicit behavior change driver used—will depend on the approach with which it is combined.		
Targeted hardware subsidies prior to construction									
OBA									

Notes:

1. Focus was determined based on guidelines or theory. The darker shade indicates primary focus and lighter shade indicates secondary focus, if applicable. In practice, the approaches may be adapted to include all three focus areas in different contexts.
2. Peer/social pressure may be positive or negative.

5.1.6 Implementation Arrangements

A variety of implementation arrangements and models are used in each of the approaches, and different combinations of actors are found (Table 3). Decisions regarding arrangements will strongly influence costing of programs.

Table 3. Actors involved in rural sanitation approaches

Approach	Actors involved in implementation at different levels		
	National	Subnational	Community
PHAST, CHAST	<ul style="list-style-type: none"> Implementing agency facilitators 	<ul style="list-style-type: none"> Implementing agency facilitators Local government officers 	<ul style="list-style-type: none"> Community health workers School teachers and children All household members in participating communities
CHC	<ul style="list-style-type: none"> Implementing agency 	<ul style="list-style-type: none"> Implementing agency Local government officers Health extension workers 	<ul style="list-style-type: none"> Trained community-based facilitators Participating household members
CLTS, SLTS	<ul style="list-style-type: none"> Implementing agency facilitators 	<ul style="list-style-type: none"> Implementing agency facilitators Local government officers 	<ul style="list-style-type: none"> Community health workers Natural leaders and other community leaders Masons/artisans School teachers and children All household members in participating communities
SanMark, SAAB, DMS	<ul style="list-style-type: none"> Implementing agency 	<ul style="list-style-type: none"> Implementing agency Local government officers (for community mobilization and regulation) Sales agents Small business owners MFIs and credit officers 	<ul style="list-style-type: none"> Masons/artisans Participating household members
Sanitation microfinance	<ul style="list-style-type: none"> Implementing agency 	<ul style="list-style-type: none"> Microfinance institutions and credit officers 	<ul style="list-style-type: none"> Participating household members
Targeted hardware subsidies prior to construction	<ul style="list-style-type: none"> Implementing agency 		<ul style="list-style-type: none"> Masons/artisans Participating household members
OBA	<ul style="list-style-type: none"> Implementing agency 	<ul style="list-style-type: none"> Local government officers Small business owners 	<ul style="list-style-type: none"> Participating household members

Notes:

1. Local government officer refers to civil servants as opposed to elected officials.

2. National government involvement depends on the degree to which the respective approach is recognized in national policy.

Arrangements can range from small-scale, NGO-driven implementation to large, government-run programs or campaigns. They can involve centralized or decentralization decision-making processes. A key difference between the rural sanitation approaches is in the role of government actors. In behavior change approaches, the government is typically viewed as a vital stakeholder. To scale-up activities, local government civil servants are most often trained to take over responsibility for community-based activities, and advocacy activities are common at the national level. On the other hand, in market-based approaches and financing approaches, government involvement is perceived as useful as long as it does not distort the market. Government presence tends to be preferred for a) conducting social marketing and community mobilization activities and b) establishing and enforcing regulations.

5.2. Activity-based comparison of rural sanitation approaches

Activities were extracted from different projects and programs and grouped into seven categories (Figure 1). Table 4 presents this activity-based framework to compare the activities typically found in different approaches. The list is meant to be an illustrative overview to highlight similarities and differences across approaches. Given considerable variations in implementation, it may not fully capture the nuance across different programs. The discussion that follows uses this activity-based framework to compare the main attributes of the predominant approaches.

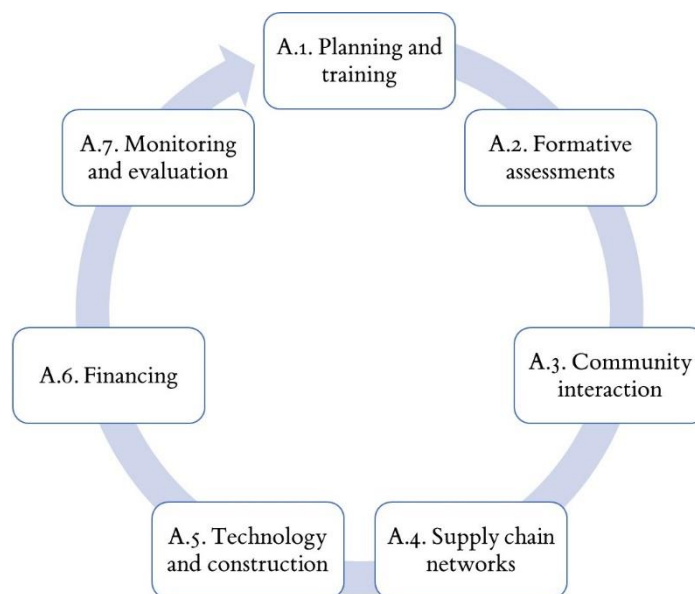


Figure 1. Categories of rural sanitation activities

A.1. Planning and training activities

As shown in Table 3, a variety of actors are engaged in implementing these approaches, requiring intensive planning and financial commitments. Although none of these approaches exclusively address the enabling environment, implementers frequently report advocacy efforts to local and national government with the aims of ensuring sustainability of programming and increasing the scale of activities through government support. These activities suggest the potential for increased coordination across approaches to improve programming efficiency.

Another common component across all approaches is training implementing actors including householders, participatory facilitators, health workers, community leaders, local government

civil servants, masons and artisans, suppliers and sales agents, and credit officers. Several approaches use the same types of actors, suggesting again the potential for coordinating training efforts, particularly if attempting to scale-up approaches.

A.2. Formative assessments

Formal or informal baseline assessments of the situation are present in all approaches, but some call for a greater investment in this formative implementation stage. As noted earlier, there is considerable variation in activities depending on the implementing agency's program design or resource constraints. Of all the approaches presented, market-based approaches incorporate a wider toolkit of formative research methods to better understand the needs and aspirations of potential customers as well as the overall supply chain landscape. There is potential here for other approaches to incorporate these formative methods in a more routine manner.

A.3. Interaction with communities, beneficiaries, or customers

Various activities occur at the community or household level. All approaches have a participatory component and typically aim to empower rural households (see Section 4.3.1 for a discussion on equity). Of the behavior change approaches, PHAST/CHAST focuses on more rational health or hygiene education activities, while the CHC approach adds an element of peer pressure and pride as emotional triggers. In CLTS and SLTS, facilitators trigger disgust at the idea of open defecation in communities through participatory activities. Techniques to incite feelings of shame or pride vary considerably within these approaches and within implementing agencies. Furthermore, these approaches have also been adapted in various ways that differ from manuals (see [33] for examples).

As shown in Table 4, market-based and financing approaches are likely to use a combination of activities to target behavior change or generate demand with potential customers, depending on findings of formative or market research. Market-based approaches also rely heavily on aspirational social marketing techniques to trigger adoption and use of latrines, which is not typical in behavior change approaches.

A.4. Supply chain networks

Support mechanisms for the supply side take various forms. Subsidy programs focus on provision of latrine hardware to households, and practitioners may therefore interact with the local supply chain to the extent to which it helps them procure material. OBA programs may interact more explicitly with supply chain networks and bolster local enterprise development than approaches that subsidize material before construction [13, 20, 32].

Behavior change approaches are fundamentally designed to not interfere directly with the supply chain. Community members are responsible for procuring their own material. In practice, however, CLTS and SLTS practitioners may train masons or artisans in building latrine slabs to enable households to access higher quality options. They may establish entrepreneur associations and attempt to link communities to market-based mechanisms [33], but the emphasis is on ending open defecation by the simplest means necessary.

Market-based approaches are expressly designed to address the supply chain for sanitation. Activities include capacity building of entrepreneurs, building and developing local enterprises where needed for different parts of latrine hardware, ensuring reliable links in the supply chain between suppliers, manufacturers and consumers, and establishing entrepreneur associations [19, 26, 27, 30].

A.5. Latrine technology and construction-related activities

Perspectives on providing access to sanitation hardware and technologies differ amongst the approaches. PHAST/CHAST implementers tend to prescribe WHO or government standards for improved latrines [17]. On the other hand, implementers of CLTS and SLTS are driven by the principle that they should not prescribe latrine options to communities. Theoretically, once communities have ended open defecation through whatever means they can afford, they may decide to upgrade latrines on their own, although available evidence does not support this assumption [12, 34]. In practice, there is no consensus amongst practitioners on the appropriate degree of technical assistance that should be provided [16]. Often, even if an external organization wants to adhere to the CLTS or SLTS principles regarding technological prescriptions, it may still have to comply with the latrine technology prescribed in government policy [33].

In market-based, microfinance, and OBA approaches, the aim is to provide affordable and desirable products that different segments of the population (or market) can purchase. This requires an understanding of consumer preferences and willingness to pay, and linking consumers to financing options. The assumption is that latent demand needs to be met with desirable and affordable supply to ensure sustained use of sanitation, which inherently requires external support in some form. Therefore, there is an explicit focus on technology and durable construction [18].

A.6. Financing activities

CLTS and SLTS approaches emphasize community self-reliance and are often referred to as “no-subsidy” approaches [12]. However, it is common to find locally-designated financing mechanisms in “triggered” communities, such as district or village government funds allocated to help the poorest of the poor construct basic latrines, or to help provide durable options for the entire community [33].

In market-based and microfinance approaches, the attempt is to provide sanitation hardware at different price points to reach different segments of the population. Consumer loans are intended to help reach the “bottom of the pyramid,” but in practice it is unclear if such approaches are able to reach the poorest of the poor. Microfinance is also leveraged to bolster small businesses to enter the sanitation market.

Some programs also address financing concerns through partial or full subsidies to community members. Although subsidies are listed here as a separate approach, behavior change approaches such as PHAST/CHAST typically subsidize hardware for entire communities, and the CHC approach also has a provision for targeting subsidies to the poorest or most vulnerable segments of the population if needed. As mentioned earlier, in the OBA approach, pre-determined subsidies or rebates are targeted typically to the poorest households as incentives to move up the sanitation ladder.

A.7. Monitoring and evaluation

Examples of monitoring and evaluation activities are listed in Table 4. All approaches involve some form of active monitoring of communities or service providers by external agencies. Behavior change approaches naturally focus more on gathering community-level data through community health workers (e.g. PHAST and CHCs) or natural leaders (e.g. CLTS) on latrine coverage, hygiene behaviors, and ODF status. Larger programs that focus on behavior change and demand such as CATS also monitor progress on the enabling environment. In market-based and financing approaches, in addition to community and household-level indicators, supply chain activities are monitored such as training small businesses, latrine sales, and loan

repayments. See [18] on some ways in which monitoring of behavior change and market-based approaches may be combined.

There are several challenges in monitoring and evaluating outcomes of rural sanitation approaches, particularly when comparing outcomes across the same approach in different settings as well as across different approaches. Indicators vary depending on the implementing organization. For example, research on CLTS has shown that although ODF is the end goal, definitions of what makes a community ODF vary considerably [21, 34]. There is also a tension between recognizing the need to adapt approaches based on demands of the local context and the need for standardized and harmonized indicators that can be compared globally.

Furthermore, post-intervention monitoring rarely occurs in a systematic manner across approaches, which is likely to be a feature of funding mechanisms rather than program design. Overall, review of these activities indicates a significant area for improvement in using monitoring and evaluation data for program improvement.

Table 4. Activity-based comparison of rural sanitation approaches

Activity	Community-based behavior change			Market-based	Sanitation microfinance	Targeted hardware subsidies	OBA
	PHAST CHAST	CHC	CLTS SLTS	SanMark SAAB DMS			
A.1. Planning and training							
Community selection	✓	✓	✓	✓	✓	✓	✓
Advocacy to government	✓	✓	✓	✓	✓	✓	✓
Training community members on sanitation technologies	✓	✓		✓		✓	✓
Training participatory facilitators	✓	✓	✓				✓
Training community health workers	✓	✓	✓	✓	✓	✓	✓
Training community/natural leaders	✓	✓	✓				✓
Training local government	✓	✓	✓	✓			✓
Training masons/artisans	✓	✓	✓	✓		✓	✓
Training suppliers, entrepreneurs, sales agents				✓			✓
Training credit officers/MFIs				✓	✓	✓	

Table 4, continued.

Activity	Community-based behavior change			Market-based	Financing		
	PHAST CHAST	CHC	CLTS SLTS	SanMark SAAB DMS	Sanitation microfinance	Targeted hardware subsidies	OBA
A.2. Formative assessments							
Baseline sanitation coverage survey		✓	✓	✓		✓	✓
Baseline KAP survey	✓	✓	✓				✓
Consumer market research (e.g. barrier analysis, willingness to pay, design)				✓			
Local supply chain assessment (e.g. landscape analysis, or informal review)		✓	✓	✓	✓	✓	✓
Microfinance feasibility study					✓		
Technology option piloting				✓			
A.3. Interaction with communities/beneficiaries/customers							
Educational activities	✓	✓		✓		✓	✓
Community mobilization (“triggering”)			✓	✓		✓	
Creating village committees/clubs	✓	✓	✓	✓	✓	✓	✓
Promoting latrine upgrading	✓	✓		✓	✓	✓	
Social marketing campaigns				✓			
Latrine technology fairs and sales events				✓			
Door to door campaigning		✓	✓	✓	✓	✓	
Sanctions and enforcement			✓				

Table 4, continued.

Activity	Community-based behavior change			Market-based	Financing		
	PHAST CHAST	CHC	CLTS SLTS	SanMark SAAB DMS	Sanitation microfinance	Targeted hardware subsidies	OBA
<u>A.4. Supply chain networks</u>							
Linking manufacturers, suppliers, consumers				✓		✓	
Local enterprise development (including one-stop-shop models)				✓		✓	
Establishing entrepreneur associations			✓	✓			
<u>A.5. Latrine technology & construction</u>							
Latrine construction support from external implementers	✓	✓		✓	✓	✓	✓
Latrine construction by households with locally available material		✓	✓				
Designing latrine technologies at different price points				✓		✓	
<u>A.6. Financing activities</u>							
Organizing consumer loans through MFIs		✓		✓	✓		
Organizing small business loans for sanitation businesses through MFIs		✓		✓	✓		
Establishing village group savings associations/self-help groups		✓	✓	✓	✓		
Allocating public funds for locally-determined and subsidies	✓		✓			✓	
Donation/discounting materials to community or targeted segments	✓	✓				✓	✓

Table 4, continued.

Activity	Community-based behavior change			Market-based	Financing		
	PHAST CHAST	CHC	CLTS SLTS	SanMark SAAB DMS	Sanitation microfinance	Targeted hardware subsidies	OBA
A.7. Monitoring and evaluation							
Active monitoring by external actors	✓	✓	✓	✓	✓	✓	✓
Community monitoring	✓	✓	✓	✓			
Collection of sales data				✓		✓	
Monitoring loan repayments				✓	✓		
Endline coverage surveys	✓	✓	✓	✓	✓	✓	✓
ODF verification visit			✓				
Post-ODF slippage survey			✓				

Notes:

1. Participatory facilitators in A.2. refers to educators, entrepreneurs, sales outlets, microfinance institutions etc.
2. Activities in this table were compiled through a review of all documents included in this review as well as interviews with experts, and therefore reflect the range of activities conducted as part of these approaches.

5.3. Strengths and weaknesses of rural sanitation approaches

Table 5 outlines the main strengths and weaknesses of the approaches, as reported in the literature and analyzed from key informant interviews. These strengths and weaknesses were broadly classified under the themes of equity, sustainability, and scale where appropriate. A few definitions are provided below to guide this section:

- **Equity** in the context of sanitation is defined as inclusivity, and the ability to ensure that disadvantaged groups—such as the poorest of the poor, disabled populations, women, and the elderly—are not excluded from the intervention. Furthermore, it also considers the potential for the intervention to provide equitable access to sanitation for different groups [7].
- **Sustainability** refers to the likelihood of maintaining target outcomes. In subsidy-based and behavior change programs, sustainability can mean continued use and maintenance of sanitation facilities; the practice of safe sanitation and hygiene; maintenance of ODF status; and moving up the sanitation ladder [7]. In market-based and financing approaches, sustainability is defined as a self-sustaining market for sanitation, with self-sustaining financial mechanisms and minimal to no external involvement [37].
- **Scale** in the context of rural sanitation programming refers broadly to increasing the number of people (households, communities, districts) with access to and using sanitation. In CLTS and related approaches, scale is defined as increasing the number of ODF communities, whereas in market-based approaches, it is often defined as giving access to the market for a larger population.

5.3.1 Equity

From an equity lens, all these approaches aim to target the poorest of the poor and to accommodate vulnerable populations, but not all are ultimately designed to be equitable.

For example, CHCs empower club members through positive peer pressure, but risk only certain groups joining the intervention, and non-members not necessarily receiving the software benefits of the intervention. Programs using PHAST/CHAST and subsidies often take away choice from individuals on the type of latrine. As a result, these individuals are not empowered. Targeted hardware subsidies, if used effectively, are the most likely of all approaches to assist the poorest and most vulnerable segments of the population with durable sanitation options, but the challenge of identifying and targeting the neediest is documented as a real challenge.

CLTS and related approaches are empowering in that they place the sanitation decision squarely on community members. Evidence from CLTS programs also suggests that it works better in remote communities where open defecation is high [3], and as such can reach neglected communities. However, triggering methods risk reinforcing existing tensions and discrimination within communities [5, 6]. Since communities are typically not provided hardware or construction assistance, it also means that poorer segments of the population are less likely to build durable and sustainable latrines, and not be able to move up the sanitation ladder [1].

Market-based and financing approaches are also empowering in that they allow individuals to make their own decisions; unlike other behavior change approaches, these set of approaches are designed to provide individuals with a variety of aspirational options at different price points. The weakness with regard to equity is that people must then be willing and able to pay for sanitation at a level that matches the available price points and financing schemes. OBA and related approaches that provide rebates after construction are described as being able to reach the poorest of the poor and reduce economic distortions that often result from traditional blanket subsidies, but rigorous

evidence is limited [13]. They also require individuals (or suppliers) to pre-finance construction activities, and are therefore less likely to be able to reach the poorest of the poor.

5.3.2 Sustainability and scale

In interviews with key informants, sustainability and scale were often discussed together; strengths and weaknesses are therefore discussed jointly below.

Sustainability of behavior change and latrine use is a concern across all approaches. Health messages in PHAST/CHAST do not guarantee sanitation behavior change and social norms. The CHC approach tries to address this by adding positive peer pressure to encourage behavior change. CLTS and SLTS focus entirely on behavior change through both positive and negative emotional triggers, but it is unclear if the techniques are sufficient for sustained behavior change. In market-based approaches, the assumption is that purchase of latrines implies latrine use; however, it is unclear if this assumption is valid, particularly in ensuring sustained changes.

Behavior change approaches are not designed to adequately tackle the supply-side of sanitation; CLTS, in particular, often results in latrines being constructed by community members using poor quality materials. In this sense, latrines built through targeted hardware subsidies are more durable and sustainable from an infrastructure perspective, but their construction does not guarantee use or maintenance. Furthermore, such subsidies can lead to a dependency syndrome in communities and build expectations of future support, which can hurt the introduction of other more empowering approaches.

Market-based approaches are explicitly designed to understand the supply chain and provide durable, affordable and desirable sanitation options for households. The assumption is that creating financially viable small businesses, strengthening the supply chain, developing desirable and affordable technologies, and involving government regulation where necessary should lead to a self-sustaining system that can continue to grow through market forces. However, a key challenge is to convince small businesses and microfinance institutions that sanitation can be an income generating investment. Sustainability of the system also depends on latent demand and willingness to pay.

The use of these approaches at a larger scale requires well trained facilitators or businesspeople and varying degrees of government support. Behavior change approaches require continued facilitator interaction with households or communities to sustain behavior and practices, and in the case of CLTS and SLTS, maintain ODF status. This requires longer-term funding, and recruiting, training, and retaining qualified personnel. Approaches such as OBA and microfinance also require technical expertise—which may be hard to find in rural contexts—to monitor loan repayments and verify rebate mechanisms to ensure accountability. No systematic method for this type of sustained interaction was found through this review.

Table 5. Strengths and weaknesses of rural sanitation approaches from the perspectives of sustainability, equity, and scale

Approach	Strengths	Weaknesses or Challenges
PHAST, CHAST	Equity <ul style="list-style-type: none"> Typically target all individuals in community 	Sustainability <ul style="list-style-type: none"> Health messages not guaranteed to ensure behavior change and social norms Continued interaction with individuals required to sustain behavior and practices. Equity <ul style="list-style-type: none"> Significant time commitment required from community members Scale <ul style="list-style-type: none"> Well-trained facilitators required
CHC	Sustainability <ul style="list-style-type: none"> Clubs can function after intervention and used for other community development activities Equity <ul style="list-style-type: none"> Individuals empowered through positive peer pressure to encourage behavior change 	Sustainability <ul style="list-style-type: none"> Health messages not guaranteed to ensure behavior change and social norms Continued interaction with clubs required to sustain behavior and practices Equity <ul style="list-style-type: none"> Potential for selection bias into clubs and exclusion of non-CHC members from sanitation improvements Significant time commitment required from community members Scale <ul style="list-style-type: none"> Well-trained facilitators required Government support required to scale
CLTS, SLTS	Sustainability <ul style="list-style-type: none"> Focus on behavior over infrastructure Equity <ul style="list-style-type: none"> Community members empowered to identify own solutions Scale <ul style="list-style-type: none"> Potential to mobilize entire communities toward collective change to end open defecation 	Sustainability <ul style="list-style-type: none"> Continued interaction with community required to sustain ODF status Evidence unclear on ability to change social norms in long run Often results in poor quality latrine construction Equity <ul style="list-style-type: none"> Potential to reinforce existing tensions and discrimination within communities Potential to shame different members of community Significant time commitment required from community members Scale <ul style="list-style-type: none"> Well-trained facilitators required Government support required to scale

Table 5, continued.

Approach	Strengths	Weaknesses or Challenges
SanMark, SAAB, DMS	<p>Sustainability</p> <ul style="list-style-type: none"> • Potential for self-sustaining activities through market forces <p>Equity</p> <ul style="list-style-type: none"> • Individuals empowered to make own decisions <p>Scale</p> <ul style="list-style-type: none"> • Potential to harness market forces to scale with minimal public sector or NGO intervention 	<p>Sustainability</p> <ul style="list-style-type: none"> • Assumption that latrine purchase guarantees use; purchase does not guarantee long-term behavior change <p>Equity</p> <ul style="list-style-type: none"> • Challenge to reach poorest segments of population <p>Scale</p> <ul style="list-style-type: none"> • Well-trained professionals in market development required • Basics of a supply chain network required to scale-up • Some latent demand for sanitation required
Sanitation microfinance	<p>Sustainability</p> <ul style="list-style-type: none"> • Potential for self-sustaining activities through financing institutions <p>Equity</p> <ul style="list-style-type: none"> • Financing options for different segments of population • Individuals empowered to make own decisions <p>Scale</p> <ul style="list-style-type: none"> • Potential to harness MFIs to scale with minimal public sector or NGO intervention 	<p>Sustainability</p> <ul style="list-style-type: none"> • Reliance on MFIs that typically perceive sanitation as not income-generating, and as risky regarding debt repayment by both clients and institutions • Assumption that latrine purchase guarantees use; purchase does not guarantee long-term behavior change <p>Equity</p> <ul style="list-style-type: none"> • High willingness to pay required • Challenge to reach poorest segments of population • Risk of household debt accumulation <p>Scale</p> <ul style="list-style-type: none"> • Financial expertise required to implement effectively • Understanding and culture of loans required • Established demand for sanitation services required • Committed staff required to follow-up on repayments

Table 5, continued.

Approach	Strengths	Weaknesses or Challenges
Targeted hardware subsidies prior to construction	<p>Sustainability</p> <ul style="list-style-type: none"> • Subsidized latrines often high quality and durable <p>Equity</p> <ul style="list-style-type: none"> • Potential to benefit poorest and most vulnerable segments of communities 	<p>Sustainability</p> <ul style="list-style-type: none"> • Subsidies not guaranteed to ensure behavior change and social norms • Potential to create dependency syndrome in communities and build expectations of future support, which can hurt introduction of other approaches <p>Equity</p> <ul style="list-style-type: none"> • Individuals not empowered to choose sanitation option <p>Scale</p> <ul style="list-style-type: none"> • Substantial financial commitment required for scale-up
OBA	<p>Sustainability</p> <ul style="list-style-type: none"> • Potential to reduce economic distortions that result from traditional blanket subsidies <p>Equity</p> <ul style="list-style-type: none"> • Potential to benefit poorest and most vulnerable segments of communities <p>Scale</p> <ul style="list-style-type: none"> • Strengths will depend on behavior change or supply-side approach targeted by OBA 	<p>Sustainability</p> <ul style="list-style-type: none"> • Assumption that latrine purchase guarantees use; purchase does not guarantee long-term behavior change <p>Equity</p> <ul style="list-style-type: none"> • High willingness to pay needed • Typically, suppliers need to ‘pre-finance’ before receiving OBA assistance <p>Scale</p> <ul style="list-style-type: none"> • High degree of planning, monitoring and verification necessary to ensure accountability, especially if expanding scale

6. Summary and Commentary

Five main considerations for compatibility are presented based on similarities and differences in the core elements of the included approaches.

6.1 Fundamental differences in a “beneficiary” versus “customer” philosophy will affect the ability to combine or sequence certain approaches.

By and large, practitioners using PHAST and targeted hardware subsidy approaches tend to see individuals as “beneficiaries” who need assistance. The CHC approach empowers individuals, but has a provision for subsidies as a last resort. In approaches such as CLTS and SLTS, individuals are given greater agency and discretion to identify solutions on their own, but are still beneficiaries of a software intervention. Meanwhile, in market-based and microfinance approaches, the individual is viewed as a customer, with a demand for sanitation, aspirations, and willingness to pay. Depending on where the OBA is targeted, this type of approach may view the individual as a beneficiary or a customer.

There can be an inherent clash between this beneficiary versus customer mindset. Differences in philosophy can affect the ability to combine or sequence approaches, as well as equity concerns (i.e. ability to reach the most vulnerable households). However, given the flexibility built into most of these approaches in theory and practice, it would be possible to adapt and merge perspectives to some extent. For example, the CHC or CLTS approaches can be adapted to view individuals as “customers” who are triggered, whose willingness to pay and needs are ascertained, and who are subsequently linked to the market and MFIs. Practitioners looking to combine approaches will need to agree upon the theory of change and philosophy in advance to ensure compatibility.

6.2 Basic differences in the population and targets are important to recognize, but outcome measures can be combined to achieve end goals.

All approaches included in this review primarily target rural communities, but they differ in terms of the size of the target area. The more educational approaches (PHAST, CHAST, CHCs) target community-wide change but intervene through participating households, with the expectation that it will then diffuse to the community. CLTS and SLTS, with the aim of ending open defecation, explicitly target entire communities (or school catchment areas). Market-based, microfinance, and OBA approaches, on the other hand, target wider areas, such as districts, but success is measured by the number of customers purchasing and using latrines as opposed to community-wide ODF status.

Ultimately, practitioners of all approaches want individuals to act, even if the overall target population differs—by changing their behavior and contributing to latrine construction or financing (targeted hardware subsidy, OBA), building their own latrine (CLTS), or purchasing a latrine with cash or loans (market-based, microfinance). Therefore, differences in the scope of the target population should not fundamentally hinder compatibility between approaches.

Although the aim of all the approaches is to improve rural sanitation, goals are wide-ranging, from ending open defecation at the community, school catchment area, or district level (CLTS, SLTS), to 100% household latrine coverage (found in variations of all approaches), to increase in latrine sales and repayment of loans (market-based, microfinance) to broader improvements in hygiene and sanitation behavior (PHAST, CHAST, CHCs).

Whether it is ODF or an incremental increase in latrine coverage, these goals are not incompatible. Practitioners considering combining approaches will have to modify monitoring and evaluation tools, but this may also provide an opportunity to combine or pool indicators to strengthen the process. Such an effort would aid in improving global comparisons of sanitation data.

6.3 Planning and training activities can be coordinated when combining or sequencing demand- and supply-related activities across approaches.

Essential activities across most approaches include training, baseline assessments and routine follow-up activities such as community monitoring, spot checks, coverage surveys, and ODF verification visits. These activities all require motivated team members, and the similarities provide an opportunity to jointly coordinate training and engagement of different actors who will play a key role in the various approaches.

Practitioners of all included approaches note the struggle with recruiting, training, and retaining qualified personnel, particularly facilitators. Joint planning and budgetary allocations can ensure efficient use of resources when trying to combine demand-generating and supply-side approaches. Careful planning and coordination of these pooled resources may help identify and retain talented staff, provide more effective training, and increase overall implementation effectiveness.

6.4 Differences in behavior change techniques and drivers will influence the compatibility and adaptation of specific approaches.

Although practitioners of all approaches now recognize the need for community participation, behavior change techniques differ across approaches—from educational (PHAST, CHAST, CHCs), to exerting negative peer pressure (CLTS, SLTS), to exerting positive peer pressure (CHCs, CLTS, SLTS), to aspirational social marketing (market-based approaches). Notably, market-based, microfinance, and OBA approaches assume that latent demand for sanitation exists to a large extent in rural communities, whereas behavior change approaches are not driven by this assumption and instead focus first on generating demand.

Different contexts will require the use of different behavior change techniques. Although behavior change programs are stronger at generating demand and mobilizing communities, thorough formative research or situational analyses are not standard practice. This means that communities may not always be targeted with the appropriate behavior change approach given their context. Market-based approaches emphasize formative research and have a stronger toolkit of social marketing methods to understand the consumer. There is potential here for behavior change approaches to incorporate these techniques as standard practice.

6.5 Practitioners can capitalize on supply and demand-based strengths of different approaches.

Even if some approaches are characterized primarily as demand-generating and others as supply-side, rural sanitation practitioners agree that both supply and demand matter in any intervention. Differences arise in the perceived role of the implementer in providing technical support and financing to household or community members. For example, CLTS in theory does not endorse external suggestions on latrine technologies or subsidies of any kind; in practice, different forms of technical assistance are often provided in an ad hoc manner, and in some cases, subsidies are also offered, indicating considerable flexibility.

Analysis of the literature suggests clear potential for combining the three types of approaches. Combining and sequencing is particularly important from an equity perspective to be able to reach vulnerable populations in a more direct and deliberate manner. All included approaches struggle in the attempt to sustain outcomes, whether it is maintaining latrine usage, maintaining ODF status, or having a self-sustaining market for sanitation. Providing targeted hardware subsidies prior to construction may be inconsistent with CLTS, SLTS, and CHC principles. However, such behavior change approaches can be combined with market-based approaches, microfinance or OBA to ensure that individuals who want to change their behavior can purchase durable and desirable latrines at different price points that are more likely to be sustained.

7. Conclusion

This review of the predominant rural sanitation approaches characterized and compared the core components of the predominant behavior change, market-based, and financing approaches. An activity-based characterization was used to compare the approaches, which revealed considerable overlap, underscoring the need to look beyond the labels of specific approaches. Instead, the review suggests that the component parts of approaches should be considered to identify which sets of activities—rather than “approaches”—are appropriate for different contexts. This type of analysis can lead to the development of a more holistic strategy for rural sanitation.

There is considerable variation in implementation within approaches; this review captured key components to enable a broad comparison. Most of the approaches primarily targeted one or a few aspects of overall sanitation programming (behavior change, sanitation supply chain, financing mechanisms). Nevertheless, the activity-based framework analysis suggests that an integrated strategy will need to consider the sanitation “system” as a whole. The following components should all be incorporated and tailored to the appropriate context:

- targeting community behavior change in a participatory manner;
- building or strengthening supply-side and financing support mechanisms at an early stage; and
- incorporating equity and sustainability concerns in a more systematic manner

The approaches included in this review are implemented globally at different scales. Further investigation is needed to understand the experience of implementing them in different contexts, particularly:

- the effectiveness and impact of individual approaches
- the effectiveness and impact of combining or sequencing approaches
- the potential to scale individual approaches or a combination of approaches
- differences in the role of the enabling environment in different approaches

For example, where educational initiatives are unable to generate widespread community mobilization, approaches such as CLTS, SLTS, and CHCs may be able to trigger changes through innovative behavior change methods. Where these approaches struggle to provide households with improved and affordable sanitation options, market-based approaches may build the capacity of the supply chain and involve the private sector in sanitation. In turn, sanitation microfinance and OBA approaches may enable the poor to gain access to better sanitation facilities. Depending on the context, the strengths of different approaches should be capitalized upon to design holistic rural sanitation programming.

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Appendix I. Expert consultations with key informants

Name	Affiliation (Expertise)
Clarissa Brocklehurst	Independent Consultant (rural sanitation)
Steve Sugden	Water for People (rural sanitation)
John Sauer	PSI (sanitation business)
Yi Wei	iDE (sanitation marketing)
Louise Medland	Oxfam (sanitation marketing)
Ashley Labat, Kristie Urich	World Vision US (Rural WaSH)
Samuel Diarra, Emmanuel Opong	World Vision Western and Southern Africa (rural sanitation)
Kaida Liang	The Water Institute at UNC, previously with WaterShed Cambodia (sanitation marketing)
Kate Shields	The Water Institute at UNC (sanitation market exchanges in South Pacific Islands)
Jeff Albert	Wash PALS, previously with CHOBA project, (output-based aid)