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WATER, SANITATION, AND HYGIENE PARTNERSHIPS AND LEARNING FOR SUSTAINABILITY (WASHPaLS)

Final Report

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ACRONYMS AND ABBREVIATIONS

ASAL	Arid and Semi-Arid Land
C	Component
CFM	Child Feces Management
CFN	Clean, Fed, and Nurtured
CKM	Communications and Knowledge Management (USAID)
CLTS	Community-Led Total Sanitation
DEC	Development Experience Clearinghouse
DFID	Department for International Development
DIY	Do-It-Yourself
DRC	Democratic Republic of Congo
DST	Decision Support Tool
E3	Bureau for Economic Growth, Education, and Environment
FGD	Focus Group Discussion
fsQCA	fuzzy-set Qualitative Comparative Analysis
GAIM	Gender Analysis and Integration Matrix
GESI	Gender Equality and Social Inclusion
GHP	Global Handwashing Partnership
GIP	Gender Integration Plan
GOE	Government of Ethiopia
GOG	Government of Ghana
GPS	Global Positioning System
GtN	Growth through Nutrition (USAID)
GUC	Grants Under Contract
HWWS	Handwashing with Soap
icddr,b	International Centre for Diarrhoeal Disease Research, Bangladesh
ICT	Information and Communications Technology
iDE	International Development Enterprises
IE	Impact Evaluation
IYC	Infants and Young Children
KEA	Kenya and East Africa
KII	Key Informant Interview
KIWASH	Kenya Integrated Water Sanitation and Hygiene Project (USAID)
km	Kilometer
M&E	Monitoring and Evaluation

M2W	Mobile-to-Web
MBS	Market-Based Sanitation
MEL	Monitoring, Evaluation, and Learning
MFI	Microfinance Institution
MHH	Menstrual Hygiene Health
MHM	Menstrual Hygiene Management
MWDSEP	Ministry of Water Development, Sanitation, and Environmental Protection (Zambia)
NGO	Nongovernmental Organization
NOURISH	Cambodia Integrated Nutrition, Hygiene, and Sanitation Project (USAID)
OD	Open Defecation
ODF	Open Defecation Free
OSS	One-stop Shop
OU	Operating Unit
PE	Performance Envelope
PRO-WASH	Practices, Research, and Operations in WASH (USAID)
Q	Quarter
RANO WASH	Rural Access to New Opportunities in Water, Sanitation, and Hygiene Project (USAID)
RAPID	Resilient Arid Lands Partnership for Integrated Development (USAID)
RCT	Randomized Controlled Trial
REOI	Request for Expressions of Interest
RFS	USAID Bureau for Resilience and Food Security
RIU	Research-into-Use
RRSG	Rethinking Rural Sanitation Guidance
SanPlan	Sanitation Planning Tool
SDC	Swiss Agency for Development and Cooperation
SPS	Safe Play Spaces
SSSP	Small-Scale Service Provider
STTA	Short-Term Technical Assistance
TBD	To be Determined
TIPS	Trials of Improved Practices
TOCOR	Task Order Contracting Officer's Representative
TSP	Turnkey Solution Provider
UK	United Kingdom
UNC	University of North Carolina
UNICEF	United Nations Children's Fund (formerly United Nations International Children's Fund)
US	United States

USAID	United States Agency for International Development
USHA	Uganda Sanitation for Health Activity (USAID)
W4H	Water, Sanitation, and Hygiene for Health Project (USAID)
WADI	Water and Development Indefinite Delivery Indefinite Quantity Contract
WASH	Water, Sanitation, and Hygiene
WASHPaLS	Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability
Y	Year
ZSHP	Zambian Sanitation and Hygiene Program (DFID)

PREFACE

The United States Agency for International Development's (USAID) Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) Project was a five-year task order awarded to Tetra Tech on September 16, 2016, under USAID's Water and Development Indefinite Delivery Indefinite Quantity Contract (WADI). Tetra Tech implemented the project in collaboration with several nongovernmental organizations and small business partners—Aquaya Institute, FHI 360, FSG, and Iris Group—that contributed expertise in state-of-the-art water, sanitation, and hygiene (WASH) programming and research. Distinguished academics, practitioners, and policymakers from across the WASH sector provided expert perspectives regularly to the project through an internal research working group and an external Advisory Board.

WASHPaLS supported USAID's goal of reducing morbidity and mortality in children under five by ensuring USAID programming employs high-impact, evidence-based environmental health and WASH interventions. WASHPaLS identified and shared best practices for achieving sustainability, scale, and impact by generating evidence to support the reduction of open defecation and the movement of communities up the sanitation ladder, while also focusing on novel approaches for reducing infants' and young children's (IYC) exposure to feces. Specifically, WASHPaLS:

1. Offered 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. Generated 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 experienced by IYC (Component 2), specifically focusing on:
    - Examination and analysis of Community-Led Total Sanitation including a dedicated information and communications technology activity (Task 2.1),
    - Exploration of market-based sanitation (Task 2.2), and
    - Testing approaches to improve hygienic environments for IYC (Task 2.3), also referred to as Safe Play Spaces;
3. Administered a small grants program on innovations in hygiene behavior change (Component 3); and
4. Engaged and partnered with national and global stakeholders to promote the use and application of project-generated evidence and global best practices by practitioners and policymakers, tapping into broad coalitions and dynamic partnerships (Component 4).

The WASHPaLS Final Report covers the full period of implementation from September 16, 2016, to February 24, 2022, and presents the project's major achievements and notable challenges.

Pursuant to Section F.5 of the WASHPaLS Task Order and with the consent of the WASHPaLS Task Order Contracting Officer's Representative, this report includes material that would otherwise have been part of a separate Quarterly Report and a Year 6 Annual Partnerships Report.

1.0 OVERVIEW OF ACHIEVEMENTS

Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) was a research and learning project whose overarching objective was to conduct high-quality implementation research that was timely and relevant, and that ultimately would be used by sector stakeholders to improve programming and delivery of rural sanitation interventions. WASHPaLS sought to advance the policy discourse to be more inclusive and responsive to the sanitation needs of rural populations.

As a research-into-use (RIU) project WASHPaLS generated knowledge outputs (i.e., produced evidence) in partnership with other projects, organizations, and individuals; and through these partnerships promoted the dissemination and use of the evidence generated to maximize its utility and influence on policy and practice at local, national, and global levels. Partnerships were a vital element of WASHPaLS. Partnerships were used to confirm the relevance of the research agenda, co-generate knowledge and learning through collaborative and coordinated implementation, disseminate findings, distribute resources, or perform other related activities that furthered the project's objectives. WASHPaLS' partners co-implemented research activities, contributed data, facilitated access to programs (including through administrative and logistical support), provided insights to analysis and current thinking, and supported the dissemination of research findings within their organizations and to broader audiences in their networks.

WASHPaLS conducted implementation research in three core areas—community-led total sanitation (CLTS), market-based sanitation (MBS), and improvement of hygienic environments. The project supported United States Agency for International Development (USAID) operating units through 18 technical assistance assignments ranging from performance and impact evaluations to a significant effort to understand menstrual hygiene and health (MHH) in the workplace, and managed a small grants program that administered nine grants supporting innovations in hygiene behavior change. Across the portfolio, WASHPaLS implemented or supported research activities in 20 countries (see Appendix 3), working in collaboration with local and national governments, nongovernmental organizations (NGOs), civil society organizations, and other donors.

WASHPaLS strengthened relationships with international and national sector stakeholders who, increasingly over the life of the project, recognized and appreciated the project's findings, recommendations, and collaborative approach to activity planning and implementation.

The WASHPaLS' research and learning model proved to be very successful and conducive to producing high-quality independent analysis recognized and accepted by water, sanitation, and hygiene (WASH) sector stakeholders and USAID.

The project Advisory Board was an important element in ensuring the quality and relevance of the research, and for serving as a conduit for disseminating the learnings and supporting uptake of the findings. While meetings of the Board were instructive and always provided lively discussion, it was individual consultations with Board members that most supported research activities and the development of partnerships.

The WASHPaLS technical team included two Research Advisors (initially three) who brought academic rigor and oversight to research design and implementation, helping to ensure that current and recently completed academic and other implementation research was considered in research design. Though WASHPaLS did not have a go-to academic partner, over the course of the project, WASHPaLS worked with or received support from academic researchers representing 20 academic institutions (11 US and 9 international).

WASHPaLS research findings and lessons learned were disseminated and shared widely: the project produced 13 peer-reviewed manuscripts that were published in academic journals (see Appendix 4) and 164 reports, briefs, and communication materials, and hosted 13 webinars and 126 workshops/events—and through these reaching almost 24,710 people. These project outputs helped shape numerous important outcomes, including 28 reports, policies, agreements, action plans, and strategies influenced by WASHPaLS.

WASHPaLS faced implementation challenges, most notably related to the COVID-19 pandemic that impacted operations significantly over the last two years of the project as countries placed restrictions on international and domestic travel and on in-person gatherings. WASHPaLS adapted and pivoted as needed and continued to make progress in all workstreams. Working with and through partners as much as WASHPaLS did also presented a unique set of challenges regarding timelines, priority setting, and perspectives.

In the final year of the project, the Strategic Partnerships Advisor conducted a series of interviews with users of WASHPaLS' findings, collaborators, and advisors to identify perceptions of success in embedding WASHPaLS findings in the sector, as well as on the partnership approaches that supported this uptake. Through this outreach, WASHPaLS engaged key partners in the reflection process and received guidance on dissemination in the final months and recommendations on how to sharpen RIU efforts, like those of WASHPaLS, going forward.

Interviewees suggested that WASHPaLS is appreciated for the "robust and rigorous" quality of its contribution across the board, which is sharpening the discussions in the sector around CLTS, MBS, and hygienic environments. Interviewees also suggested that there is a clear need for "internal translators" to ensure that the research findings can be applied. Topline findings need to be sophisticated enough to interest thought leaders, but then nuance and guidance is needed that is simple and prescriptive enough so that practitioners and field staff know what to do as a result.

From a partnership perspective, more intentionality and early engagement of potential partners is critical to ensuring that WASHPaLS' analysis fits the needs of the sector. Frequent "reality checks" with local, national, and international partners will help to underscore what they need and when. Having contributed to quite specific elements, stakeholders were also keen to understand the entire body of WASHPaLS' work.

Below are highlights of the major accomplishments and challenges by project component. (A list of all contract deliverables produced by WASHPaLS is provided in Appendix 1. Appendix 2 provides a list of the dataset sets generated by WASHPaLS research that were submitted to the USAID Development Data Library [DDL]).

1.1 COMPONENT 1: TECHNICAL ASSISTANCE TO USAID

Over the life of the project, WASHPaLS received 18 requests for technical assistance, totaling $9.6 million (see Table 1, Section 2). Notably, the pace of Operating Unit (OU) requests for technical assistance increased as the activity advanced and the quality and relevance of WASHPaLS research activities became known. Of the 18 requests, or buy-ins, six were issued in the first three years of the project and 12 in the final two years. Managing the numerous concurrent activities stretched the team, particularly in light of the pandemic and the need to frequently adjust and readjust timelines and budgets.

Buy-ins included two impact evaluations, four performance evaluations, three sanitation market assessments, and several research activities, including on MHH in the workplace, formative research on gender and WASH, and understanding the impacts of COVID-19 pandemic on access to WASH services and products. WASHPaLS also provided pass through support to the Global Handwashing Partnership.

While it was unclear at the outset how these technical assistance activities would contribute to or complement research in the three core areas (project leadership did not know what the OUs would want and it was not expected that they necessarily would contribute), the results were surprising. In fact, several buy-ins specifically linked to a research area, such as the sanitation market assessments, and others contributed and added richness to the learning, such as the pastoralists sanitation activity in Kenya. Additionally, the MHH in the workplace activity evolved into a fourth core area of research.

1.2 COMPONENT 2: IMPLEMENTATION RESEARCH

The three core areas of research—CLTS, MBS, and hygienic environments—were pre-determined by USAID in the Request for Task Order Proposals, but the direction the research took and the actual research questions investigated under each of the three areas were determined by the project following an extensive desk review and consultation process. The resulting research questions were those that were deemed to be most relevant to the sector, filled important gaps in understanding and availability of evidence, and fell within the limits of the project to undertake, both with respect to budget and to implementation timeline.

Work under each of the research streams consisted of two sequential phases. The first phase consisted of an initial desk study that included literature review and key informant interviews (KIIs) to identify gaps in the evidence base and refine the research questions to investigate. The second phased involved field-based implementation research that sought to fill the identified gaps.

The project developed an assortment of reports and interactive products and presented them to the WASHPaLS Advisory Board and various USAID and global audiences. WASHPaLS also engaged sector thought leaders and institutions with global reach to facilitate uptake of the project's research findings, which were referenced in peer-reviewed publications and literature. Sector actors continue to report positively on the value and utility of WASHPaLS products.

1.2.1 COMMUNITY-LED TOTAL SANITATION

As guided by the findings of a comprehensive literature review and consultation with global thought-leaders, WASHPaLS implementation research related to CLTS focused on two overarching themes.

The first was an examination of whether subsidies targeted at the poorest and most vulnerable households in a community may serve to improve the sustainability and equity of sanitation gains from CLTS. The study sought to determine the extent to which targeted subsidies covering a portion of toilet costs increased sanitation coverage, quality, and use among vulnerable households, as well as whether subsidy benefits spill over to the rest of the community. The study also documented challenges to implementation of the subsidy program. The research was conducted in Ghana in partnership with the United Nations Children's Fund (UNICEF). In alignment with the "Pro-Poor Guidelines" issued by the Ministry of Sanitation and Water Resources in June 2018, the UNICEF/Government of Ghana (GOG) program offered a subsidy to vulnerable households within open defecation free (ODF) communities in two districts (Tatale and Kpandai) to construct durable toilets acquired through the local sanitation market. This provided WASHPaLS the opportunity to layer a randomized controlled trial (RCT) experiment on top of UNICEF programming. As a complement to the research on subsidies, WASHPaLS co-funded (with Government of Australia's Department of Foreign Affairs and Trade and the World Bank) completion of endline data collection and analysis for a random assignment experiment of CLTS and targeted subsidies in Laos.

For the second line of research, WASHPaLS partnered with CLTS implementers and governments to research and better understand the range of conditions in which CLTS is most effective (the so-called Performance Envelope [PE]), to guide future implementation and investment decisions by governments, donors, and implementers. WASHPaLS analyzed datasets from six CLTS programs in Cambodia, Ghana,

Liberia, and Zambia and compared performance reflected in programmatic monitoring with publicly available, spatially explicit data. WASHPaLS also analyzed other factors associated with CLTS program performance, including remoteness, water availability, literacy with a particular focus on women, and land cover characteristics (such as vegetative cover). Additionally, WASHPaLS conducted a landscape assessment of information and communications technology (ICT) use cases in the WASH sector as an initial step toward understanding the demand and potential use for development or customization of a technology solution to support large-scale implementation and/or monitoring of CLTS programs.

Key findings from the CLTS research include the following:

- ***Subsidies play an important role for expanding rural sanitation.*** Subsidies are pervasive in the delivery of water and sanitation services, but they often are poorly targeted and opaque, and can be distortionary. Even so, denying subsidies for onsite containment to the poorest sub-populations is not justified given the evidence that low durability toilets are a major cause for slippage back to open defecation (OD). Although the original conception of CLTS avoided subsidies, carefully designed subsidies can result in more durable latrines, provide spillover benefits to non-eligible households, and slow reversion to OD. Subsidies can take the form of construction discounts or rebates, or in communities in the form of ODF financial rewards, among other options, tailored to the local context. Targeted subsidies should become a standard element of area-wide sanitation programming.
- ***Sustaining CLTS gains requires addressing poor durability of installed latrines.*** The extensive and often rapid efforts of triggered communities to dig latrine pits can result in facilities with low durability that fail rapidly. Addressing the durability of pit latrines—particularly the structural soundness of interfaces and pits—requires making sure that robust construction materials are both affordable and readily available.
- ***CLTS is well suited to small communities.*** Low-population communities were consistently associated with higher achievement of ODF status across the programs and countries, but the correlation with performance varied among countries. It is important to note, however, that though small communities offer a greater likelihood of ODF achievement, they do not necessarily offer a greater likelihood of ODF sustainability.
- ***Understanding the drivers of program performance requires tracking changes in sanitation coverage more carefully than is currently common practice.*** Routine monitoring and evaluation (M&E) of CLTS programs has been inconsistent, and as a result it has been difficult to identify how, where, and when it works best. Producing a better evidence basis for understanding CLTS performance drivers—such as recording the global positioning systems (GPS) locations of communities and documenting baseline toilet coverage—can help clarify the performance picture substantially.
- ***ODF status is a great motivator, but not a sensible performance metric.*** The ODF concept has proven an effective way to motivate collective action to reduce or even eliminate OD. However, some reversion to OD after the declaration of ODF status is inevitable, especially when toilet durability is an issue. Sometimes that reversion can be dramatic and rapid. More appropriate indicators of program performance would reflect change in either toilet coverage or reported OD over time.
- ***The critical personnel involved in CLTS should be paid to implement it.*** Sometimes the most essential personnel—such as community health volunteers and champions—are the only participants in CLTS programs that are not compensated for their services. Carefully designed financial incentives for these workers can improve program performance and result in greater success at reducing OD.

The Sanitation Planning Tool (SanPlan). As a follow-on to the PE research and with the goal of translating the findings into practical guidance and tools for rural sanitation programming, WASHPaLS developed the SanPlan tool. SanPlan is a web-based community classification tool to support the grouping of communities as defined in the Rethinking Rural Sanitation Guidance (RRSG) (developed by UNICEF, WaterAid, and Plan International) and that allows for consideration of contextual and environmental factors in sanitation program planning.

1.2.2 MARKET-BASED SANITATION

The MBS implementation research focused on two themes: the viability and sustainability of sanitation enterprises and decision support tools (DSTs) for policymakers. The first line of inquiry sought to understand the factors that impact the viability of sanitation enterprises, the profile of entrepreneurs who are best suited to function as focal points of sales for the customers, and the types of enterprise capital that are required to improve viability. To answer these questions, WASHPaLS undertook retrospective analyses of sanitation enterprises across a range of viability levels and country contexts, interviewing scores of entrepreneurs in three countries: India, Nigeria, and Cambodia.

The second line of research, on DSTs, sought to understanding how changes in market rules (e.g., legislation, government policy, and regulation) can potentially improve the viability of sanitation enterprises or lead to an increase in toilet sales. To answer this, WASHPaLS developed several Microsoft Excel-based decision support modeling tools for sanitation-related policymaking. The tools enable cost-benefit analyses of changes in market rules in three categories: (1) penalties, such as the denial of service or imposition of a surcharge on higher-income households that do not own toilets; (2) reduction in taxes or tariffs on inputs; and (3) policies that support entrepreneurs in the sanitation market directly, such as limited demand activation financial support.

Key findings from the MBS research include the following:

- ***Enterprises that focus solely on latrine production and installation are rarely commercially viable.*** Enterprises engaged in building and selling latrines serving largely rural populations are rarely commercially viable without being attached to more diversified businesses, such as those providing construction materials or other retailers such as hardware stores. The level of profit sufficient to justify the risk, time, and investment—or enterprise viability for sanitation enterprises—is most often achieved when latrines are delivered as part of a diversified business in adjacent sectors (such as construction, cement product fabrication, etc.) by an entrepreneur with requisite assets. The seasonality of demand as well as upfront investments required for latrine production and installation also limits the appeal as a standalone business venture.
- ***Maximizing enterprise viability should be a central focus of MBS programs.*** Implementers should build enterprises' business analysis, strategy, and marketing capabilities, with frequent analysis of enterprise performance in key drivers of viability—number of customers, cost per unit, price per unit, product mix, and sales of other sanitation-related products. To the degree possible, implementers should coach market actors actively instead of participating in the market directly (e.g., supplying raw materials to enterprises, or managing direct sales) to increase the probability of commercial viability and sustainability. They should also acknowledge and plan for the fact that many sanitation enterprises may not be viable, and thus focus limited resources on those that are.
- ***Active sales are often a missing link.*** Sales activities play an important role in converting the general interest a household may have in latrines into purchases; they "activate" the demand generated by interventions like CLTS and other behavior change campaigns. Investing in field sales activities that unleash latent demand should be encouraged. MBS implementers (including the government) should strongly consider sharing the cost of sales activities (though not in perpetuity if

enterprise viability is to be sustained). Implementers of MBS programs should make sure that active sales activities remain an integral part of the enterprise business model.

- ***Latrine products should be tailored to particular settings or markets.*** While market-based solutions to sanitation problems are about more than just products themselves, effective designs that are well-suited for particular settings are a necessary if not sufficient condition of achieving major increases in coverage. Latrine product designs should factor both customer needs (i.e., affordability and desirability) and enterprise needs (i.e., profitability and feasibility). A priority is to reengineer designs to reduce input materials or incorporate lower-cost alternatives while maintaining durability, making production more efficient, simplifying installation, and increasing desirability. Examples include International Development Enterprises' (iDE) Easy Latrine, Global Communities' Digni-loo, and LIXIL's SATO line of products.
- ***Address business environment barriers to scaling sanitation markets.*** Successful acceleration of private sector provision of toilets must also recognize that the business environment—itself operating within a broader political, social, and geographic context—depends strongly upon the outcomes of MBS programs. Interventions in the business environment—such as enacting supportive market rules and fostering open-source product system designs—are important for allowing markets to evolve and grow. Supportive (and well-enforced) market rules include public health regulations that encourage installation of latrines, which requires promotion by health workers, and tax/tariff exemptions. DSTs, like those developed by WASHPaLS, can help to estimate the range of outcomes from institution of policy changes.

1.2.3 HYGIENIC ENVIRONMENTS FOR INFANTS AND YOUNG CHILDREN

Research under this theme focused on the growing body of evidence suggesting that traditional WASH interventions do not adequately protect infants and young children (IYC) from exposure to fecal pathogens during early developmental stages, specifically via the fecal-oral pathway of direct ingestion of animal feces and indirect ingestion of human and animal feces through consumption of soil and exploratory mouthing behaviors. As implementers increasingly recognize the vital importance of interventions to interrupt the infant-specific pathways of pathogen exposure, the lack of solid evidence on the effectiveness of options to guide "best practice" programming was identified as a key knowledge gap. WASHPaLS sought to contribute to the evidence base around use of playmats and playpens as a feasible and appealing protective measure, while keeping a wide-angle lens on the range of options to improve hygienic environments for IYC. The core WASHPaLS research on hygienic environments was completed by several research activities conducted through the small grants program.

Through a multi-year research effort including aspects of product development, formative research, and an experimental trial utilizing the Trials of Improved Practices (TIPS) methodology, WASHPaLS sought to understand whether a protective play space (playmat and play pen) significantly reduces exposure of IYC to harmful enteric pathogens.

Key findings from the hygienic environments research include the following:

- ***Animal excreta represent a previously under-emphasized risk for child exposure to pathogens in the home environment.*** Animal excreta—particularly from domestic poultry—are a critical pathogen reservoir in rural homes. They are transmitted via contaminated soil and surfaces as well as through direct ingestion. Affordable and appealing measures to reduce excreta interactions with young children should be a public health priority.
- ***Playpens, while attractive to households, do not plausibly protect IYC from the risks of domestic animal excreta in the absence of other measures.*** Child playpens are perceived to provide great benefits for child safety and development while allowing caregivers time to complete

tasks. However, while playpens are generally cleaner than dirt floors, consistent maintenance is required for them to stay that way, and children can still be exposed to animal pathogens during even short periods of time spent on the floor, eating dirt, or mouthing contaminated objects. It is not, therefore, reasonable to assume that playmats sufficiently protect IYC in rural home settings.

- ***Sufficiently protecting children from pathogens in rural settings will likely require a mix of household improvements, including better containment of domestic animals and finished flooring.*** Two additional promising measures should be considered to reduce child pathogen exposure: (1) improved sheds for poultry containment outside the home and to minimize chicken excreta inside the home; and (2) finished flooring to limit pathogen exposure to IYC, and specifically to reduce parasite and soil-transmitted helminth infections. However, no single intervention appears to be sufficient as stand-alone measure but should be considered part of an integrated approach for protecting IYC.

1.3 COMPONENT 3: SMALL GRANTS PROGRAM

The purpose of grants awarded under the Grants under Contract (GUC) program was to investigate the effectiveness of innovative approaches to improving and sustaining WASH-related healthy behaviors. WASHPaLS issued nine grants, utilizing approximately $1.2 million of the $1.5 million allocated for grants under the task order. Eight of the nine grants were issued in response to three rounds of solicitations, each of which had a specific theme: the first focusing on Habit Formation Approaches and Gender Equality and Social Inclusion (GESI) Innovations for Hygiene Behavior Change, the second on Behavior Change Innovations to Reduce Exposure of IYC to Poultry Excreta, and the third more broadly on Innovations in Hygiene Behavior Change. A ninth grant (to EarthEnable) was issued as a sole source award (see Table 2, Section 4).

As with the buy-ins of Component 1, it was not clear or necessarily expected at the outset that findings from the grant activities would complement WASHPaLS core research directly. However, as the program evolved and the themes for the various calls emerged, it was increasingly evident that findings from the small grants would provide a nice complement to the core research work on hygienic environments. In fact, this was the case. A summary report *Toward a Hygienic Environment* incorporates findings from the grants and the Component 2 hygienic environment research.

COVID-19 impacted all active grantees in all settings, with internal and domestic travel restrictions delaying field activities. In sum, of the nine grants awarded, two closed without results; one was underpowered, and one was terminated due to COVID-induced delays. Managing grants remotely to ensure compliance with USAID regulations was challenging.

1.4 COMPONENT 4: PARTNERSHIPS AND ENGAGEMENT

Partnership and engagement were fundamental to the success of WASHPaLS; they were the vehicle through which the project conducted research, shared findings, and encouraged uptake. From the outset, all research was to be conducted in partnership and collaboration with others and findings were to be presented/shared/disseminated, when possible, with project partners or intended users of the work. Developing partnership engagement plans at the outset by the activity guided each of WASHPaLS' studies and efforts systematically.

The University of North Carolina (UNC) Water and Health Conference was the most important venue/platform for WASHPaLS to share its findings. The conference attracts a diverse audience from within and outside the sector, providing opportunities to share the research and engage others formally and informally. WASHPaLS' annual participation at UNC raised the profile of the project and provided an effective means to disseminate USAID research findings to, as well as jointly convene sessions with, important and influential sector actors. It also served to keep WASHPaLS research in the minds of the

project's intended audiences. UNC provided an opportunity to have critical conversations that informed the design of upcoming work led by others.

WASHPaLS coordinated closely with UNICEF headquarters and selected country offices on areas of mutual interest, including on CLTS, MBS, hygiene behavior change, and menstrual hygiene management (MHM). This included providing input on UNICEF's review of MHH monitoring tools and MBS training package.

Sections 2, 3, and 4 present an overview of the various lines of research undertaken by WASHPaLS and the more significant accomplishments by component, starting in Section 2 with a review of the short-term technical assistance (STTA) assignments completed (Component 1). Section 3 reviews the achievements from the three core research streams (Component 2), and Section 4 summarizes the achievements and challenges in administering the GUC program (Component 3). Section 5 reflects on WASHPaLS partnership and communication efforts, and Section 6 presents reflections on GESI. Section 7 presents the final result of the project's targets and Section 8 highlights some of the project financial management challenges and best practices utilized.

2.0 TECHNICAL ASSISTANCE TO USAID

The WASHPaLS Task Order provided a buy-in facility to support USAID OUs' access to technical assistance. The ceiling for buy-ins was $15 million (this was subsequently reduced to $14.5 million through a budget realignment in Year 5, once the window for accepting new work orders was closed). Through this facility, WASHPaLS provided USAID missions and technical bureaus access to experts in a broad array of WASH thematic areas. Over the life of the project, WASHPaLS received 18 requests for technical assistance, representing 11 OUs and totaling $9.6 million (see Table 1). Notably, the pace of OU requests for technical assistance increased as the project advanced and the quality and relevance of WASHPaLS research activities became known. Of the 18 buy-ins, six were issued in the first three years and 12 in the final two years.

Buy-ins included two impact evaluations, four performance evaluations, three sanitation market assessments, and several other research and technical assistance activities. These activities included MHH in the workplace, formative research on gender and WASH, and several on understanding the impacts of COVID-19 pandemic on access to WASH services and products.

While it was unclear at the outset of WASHPaLS how these technical assistance activities would contribute to or complement research in the three core areas (WASHPaLS did not know what the OUs would want and it was not understood or expected that they would contribute), the results were surprising. In fact, several buy-ins were specifically linked to a research area, such as the sanitation market assessments, and others contributed and added richness to the learning, such as the pastoralists sanitation activity in Kenya complementing the work on CLTS performance. The MHH in the workplace activity developed into its own core research area.

Managing the numerous concurrent activities stretched the team, particularly in light of the pandemic. Implementation timelines were frequently readjusted, budgets were uncertain. See Section 8 for additional discussion.

Following completion of a buy-in activity, WASHPaLS sent a satisfaction survey to the OU Activity Manager requesting feedback on the Technical Assistance Team's performance. The 13-question survey covered areas such as quality of product(s), timeliness, communication, among others. Across all buy-in activities and categories, WASHPaLS received a combined score of 8.6 (out of 10), indicating a high degree of client satisfaction with the work and the manner in which it was undertaken. It is noteworthy that the average scores increased in the last two years of the project to an average of 9.4, from 8.0 in Years 2 and 3.

TABLE 1. COMPONENT 1 WORK ORDERS COMPLETED

ACTIVITY	REQUESTING OPERATING UNIT	BUDGET	ACTUALS	IMPLEMENTATION DATES
1. Cambodia Integrated Nutrition, Hygiene, and Sanitation Activity (NOURISH) Impact Evaluation (IE)	Bureau for Economic Growth, Education, and Environment (E3)	$980,000*	$969,628	August 2018 – October 2021
2. Resilient Arid Lands Partnership for Integrated Development (RAPID) Activity IE	Kenya and East Africa (KEA)	$631,500*	$631,531	June 2018 – October 2021

ACTIVITY	REQUESTING OPERATING UNIT	BUDGET	ACTUALS	IMPLEMENTATION DATES
3. Kenya Integrated Water Sanitation and Hygiene Activity (KIWASH) Performance Evaluation	USAID/KEA	$194,000*	$194,013	September 2018 – March 2019
4. MHM Action Research	E3/Gender Equality and Women's Empowerment	$1,450,000	$3,704,132	February 2019 – January 2022
	E3/Women's Global Development and Prosperity	$2,000,000		
5. Support to the Global Handwashing Partnership (GHP) 2019	Global Health	$87,234	$87,233	April 2019 – April 2020
6. Water, Sanitation, and Hygiene for Health Activity (W4H) Performance Evaluation	USAID/Ghana	$187,323*	$187,232	July 2019 – March 2020
7. Gender and Hygiene Formative Research	USAID/Mozambique	$500,000	$498,218	October 2019 – October 2021
8. Ethiopia DST	Africa Bureau	$264,550	$152,161	October 2019 – November 2021
9. Support to the GHP 2020	Global Health	$87,234	$86,986	April 2020 – December 2020
10. Kenya RAPID Performance Evaluation	USAID/KEA	$155,447*	$155,447	May 2020 – February 2021
11. WASH and COVID-19 Trends and Futures Analysis	Bureau for Resilience and Food Security (RFS)	$436,314*	$436,267	May 2020 – March 2021
12. Kenya Rural Sanitation Research	USAID/KEA	$619,406	$559,093	October 2020 – December 2021
13. Growth through Nutrition (GtN) Integrated WASH/ Nutrition Assessment	USAID/Ethiopia	$199,463	$193,183	December 2020 – October 2021
14. Research and Learning in Rural Sanitation Liberia	USAID/Liberia	$799,767	$695,448	December 2020 – November 2021
15. COVID-19 Longitudinal Data	RFS/Center for WASH	$216,727*	$210,808	March – December 2021
16. Rural Access to New Opportunities (RANO) WASH Performance Evaluation	USAID/Madagascar	$172,800	$122,847	March – October 2021
17. Support to the GHP 2021	Global Health	$54,235	$54,537	June – November 2021
18. Senegal MBS	USAID/Senegal	$569,980	$487,408	June – January 2022

*These values reflect adjustments made after the original funding obligation.

A summary of the buy-ins, grouped by type of support provided, is presented below along with links to the principal deliverables and products produced under each activity. (Note that all deliverables and datasets produced by the research are provided in Appendices 1 and 2, respectively.)

2.1 IMPACT EVALUATIONS

The two IEs conducted by WASHPaLS were initiated under a different contract mechanism and transferred to WASHPaLS to finalize following completion of the other mechanism. In both instances, WASHPaLS maintained much of the original structure and design of the IE, including retaining the principal investigators.

Integrated Nutrition, Hygiene, and Sanitation (NOURISH) Impact Evaluation. USAID's Office of Water (now RFS/Center for Water Security, Sanitation and Hygiene) commissioned an IE of the NOURISH Activity to understand the effectiveness of integrated nutrition and WASH interventions. NOURISH was a five-year (June 2014–June 2019), $16.3 million USAID project to address several Global Health Initiative and Feed the Future priorities by focusing on the key causal factors of chronic undernutrition specific to Cambodia. The IE found meaningful gains in child growth attributable to the nutrition intervention when delivered alone or in combination with sanitation programming. The sanitation interventions did not significantly increase sanitation coverage over the strong unidirectional trend in the control group, and had no effect on child growth or diarrhea. No evidence was found to prove that combining these sanitation and nutrition interventions resulted in increases in child growth over the nutrition programming alone. A Fact Sheet, Final Evaluation Report, and Addendum Report are available for further detail. A manuscript on the risk factors for early childhood growth in Cambodia and independent and combined effects is available here.

Kenya Resilient Arid Lands Partnership for Integrated Development (RAPID) Impact Evaluation. USAID/KEA requested that WASHPaLS conduct an IE of the ICT-based intervention portion of the Kenya RAPID Activity. Kenya RAPID was a five-year (2015–2020), $35.5 million public-private partnership/Global Development Alliance activity, funded jointly by USAID, the Swiss Agency for Development and Cooperation (SDC), private sector partners, and Millennium Water Alliance members that addressed capacity, coordination, and communication constraints facing water access and delivery in five of Kenya's Northern arid and semi-arid lands (ASALs) counties: Garissa, Isiolo, Marsabit, Turkana, and Wajir. The ICT intervention involved the installation of sensors on water borehole pumps to transmit information to data dashboards in real time to improve water management. This was complemented with budget, tools, and training for water service providers to access and use sensor data. Of the 400 sensors installed, 69 were installed on "strategic" water boreholes, or boreholes that local authorities identified as important due to the risk of drought in the borehole area. The IE found that the sensors had limited impact on water management, that strategic boreholes fitted with sensors performed similarly to strategic boreholes in comparison counties, and that water managers reported similar timelines for borehole repairs in Kenya RAPID and comparison countries. Baseline, Midline, and Final reports were prepared, as well as a Summary of Findings.

2.2 PERFORMANCE EVALUATIONS

WASHPaLS prepared four performance evaluations—two end-of-project evaluations and two mid-term evaluations. In all instances, WASHPaLS formed evaluation teams that consisted of independent consultants led by an expatriate Team Leader and supported by experienced local subject matter experts.

Kenya Integrated Water Sanitation and Hygiene (KIWASH) Mid-Term Performance Evaluation. USAID/KEA commissioned WASHPaLS to undertake a mid-term performance evaluation of KIWASH, a $51 million five-year (2015–2020), multi-pronged activity designed to institutionalize catalytic models of sustainable service delivery for accelerated expansion of water and sanitation services, and to improve complementary hygiene behaviors. The integrated nature of KIWASH's outputs are reflected in the diverse range of its activities, from technical assistance to water utilities and WASH enterprises, to CLTS and sanitation marketing, to nutrition counseling. A Final Report, Summary Report, and Key Findings Brief are available.

Water, Sanitation, and Hygiene for Health (W4H) Performance Evaluation. USAID/Ghana commissioned WASHPaLS to conduct a performance evaluation of the W4H Activity with an emphasis on assessing sustainability of interventions. W4H was a five-year (2015–2020), $19 million activity, with the goal to accelerate sustainable improvement in water and sanitation access and improve hygiene behaviors in 15 target Metropolitan, Municipal, and District Assemblies. A Final Report, Summary Report, and Findings Brief are available.

Kenya RAPID Performance Evaluation. USAID/KEA, in conjunction with SDC, commissioned a performance evaluation of Kenya RAPID, a five-year (2015–2020), $35.5 million public-private partnership/Global Development Alliance activity funded jointly by USAID, SDC, private sector partners, and Millennium Water Alliance members. The program aimed to ensure sustainable and resilient livelihoods for communities, increase access to water and sanitation and access to water for livestock, and rebuild a healthy rangeland management ecosystem in five counties: Garissa, Isiolo, Marsabit, Turkana, and Wajir. A Final Report, Summary Report, and Key Findings Brief are available.

Rural Access to New Opportunities in WASH (RANO WASH) Performance Evaluation. USAID/Madagascar commissioned WASHPaLS to conduct a performance evaluation of the RANO WASH activity, USAID/Madagascar's largest bilateral WASH investment at the time, reaching 250 rural communes in six high-priority regions of Madagascar. Its three-pillar design focused on governance, private sector engagement, and behaviors and use. The evaluation reports and summaries are available in both English and French.

2.3 SANITATION MARKET ASSESSMENTS

The four MBS-related buy-ins complemented the core MBS research conducted under Component 2 and provided an opportunity to field test some of the tools developed. These assessments also added depth to the team's understanding of the challenges to and functioning of sanitation markets.

Ethiopia DSTs. The USAID Bureau for Africa requested that WASHPaLS conduct an assessment on the potential impact of reducing import tariffs and domestic taxes on the uptake of plastic sanitation products and the cost to the Government of Ethiopia (GOE) for doing so. The request was in support of expanding the exemptions to the broader category of plastic sanitation products as a non-excludable public good. WASHPaLS customized a DST for the Ethiopian context that simulated the impact of reducing the price on plastic sanitation-related products (such as exemption from taxes and tariffs, access to foreign exchange for domestic private sector). DST outputs presented an estimate of the costs (e.g., loss in fiscal revenue) and benefits (i.e., increase in basic sanitation coverage) of lowering the price of these products and help the GOE make an informed decision. The Final Report can be found here.

Kenya Rural Sanitation Market Assessment. USAID/KEA asked WASHPaLS to conduct applied research to generate a base of evidence for rural sanitation programming to inform future USAID investments. This applied research had two parts: first to identify strategies to increase sanitation access in pastoralist areas within the ASALs (see below for summary). The second part involved a deep dive into the status of sanitation markets at the county level. WASHPaLS conducted a sanitation market assessment in four counties to better understand the potential opportunities for MBS approaches within different contexts in Kenya. The assessment focused on increasing adoption of "durable, improved" toilets through markets. The assessment revealed that the sanitation market in rural western Kenya is ripe with potential with several favorable demand- and supply-side conditions. But poor information flows on product prices and unclear roles of certain market players impede progress in the market. The Final Report, including Key Findings, can be found here.

Liberia Sanitation Market Assessment. USAID/Liberia requested an assessment of the sanitation market nationwide with deep dives in five select counties in Liberia. The objective of this assessment was to generate findings to inform future USAID investments in rural sanitation in Liberia. WASHPaLS

provided a detailed market context to USAID and the Government of Liberia, including sanitation profiles by target county and reasons for the increase in OD, among other details. Additionally, the team issued key findings on sanitation markets, from customer, service provider, and business perspectives; and key recommendations to unlock the sanitation market in Liberia. Recommendations included specifics on customer finance, product designs, enterprise finance, and market rules. The Final Report and Research Compendium are available for further reading.

Senegal Sanitation Market Assessment. USAID/Senegal requested a two-part assessment across Senegal's sanitation value chain to inform the priorities for the mission, the Government of Senegal, and other stakeholders. The detailed sanitation market assessment contained key findings across rural and urban areas. Many of those recommendations related to the emptying or reuse of fecal sludge, a key segment of the sanitation market, which has not been the subject of significant research to date. Findings were discussed during a multi-day stakeholder workshop at the conclusion of the activity. The Final Report and Supplementary Resources are available for further reading.

2.4 HYGIENE AND OTHER RESEARCH

WASHPaLS conducted several other studies and assessments for various OUs.

Menstrual Hygiene Management Action Research. USAID's E3/Gender Equality and Women's Empowerment and E3/Women's Global Development and Prosperity offices asked WASHPaLS to undertake a two-phased activity on MHM in the workplace. In the first phase WASHPaLS identified knowledge gaps on MHM and access to WASH services for women employees, with a focus on linkages between improved MHM and women's economic empowerment. The second phase included the design and implementation of a pilot learning activity based on findings from the first phase. MHM workplace interventions were implemented in four factories, two each in Kenya and Nepal. The MHM Action Research suggested that improving sanitation facilities and MHM programming in the workplace (including providing sanitary supplies, enacting policy to support menstruating employees, encouraging male engagement, and increasing awareness of MHM in general) can yield benefits for women employees as well as the businesses that employ them, details of which were discussed in a wide series of dissemination products and learning briefs, including a global webinar on the findings. This initial research also highlighted many remaining gaps in the evidence on MHM interventions in the workplace, and that further work is needed to test the hypothesized relationships in the conceptual framework. The Final Report is available, as is a report focused specifically on MHM metrics. Additionally, a situation analysis of MHM in the workplace was conducted in Ethiopia using a political economy analysis approach. The full range of deliverables generated by this task is available on the MHM microsite on GlobalWaters.org.

Formative research for gender and hygiene behaviors in Mozambique. USAID/Mozambique commissioned WASHPaLS to conduct applied research to generate a base of evidence for WASH behavior change and gender equity programming, to be utilized in both the design and implementation of WASH project activities. WASHPaLS conducted formative research on three components: decision making for water and sanitation products and services (e.g., household connection to water system), barriers and motivations for various hygiene behaviors (e.g., handwashing, safe disposal of child feces, latrine adoption), and post-disaster recovery. The final report for this activity is available in English and Portuguese.

Growth through Nutrition WASH-Nutrition Integration Assessment. USAID/Ethiopia commissioned WASHPaLS to conduct a focused assessment of the integration of WASH and nutrition activities within the GtN activity, USAID/Ethiopia's flagship, multi-sectoral nutrition and WASH activity. Since the project's design, new evidence on multi-sectoral nutrition programming had emerged, highlighting the need to focus interventions on thoroughly interrupting fecal-oral contamination pathways. WASHPaLS found that, while direct implementers were not aware of the emerging evidence directly, the activity already included a focus on "the neglected pathways" from its inception. The

project's dispersed, relatively limited WASH focus, however, would be unable to reach scale and achieve the level of disruption of fecal-oral pathways described in the emerging research. The team generated several implementation-focused recommendations as a result of the assessment, relating to geographic focus; monitoring, evaluation, and learning (MEL); dissemination of strategy and learning; and partnership, among others.

Approaches for sanitation access in pastoralist areas in Kenya. USAID/KEA requested WASHPaLS to conduct applied research that strengthens the evidence base to inform strategies for improving access to safely managed sanitation in pastoralist areas within the ASALS of northern Kenya. The study findings will help inform future USAID investments in rural sanitation, and support UNICEF and the Government of Kenya in the development of context-specific rural sanitation guidance. The Final Report and Research Brief are available for further reading.

Support to the GHP. The Bureau for Global Health's continued funding for the GHP, the Secretariate of which is hosted by FHI 360, was channeled through WASHPaLS for three years.

2.5 COVID-19-RELATED ACTIVITIES

The COVID-19 pandemic caused significant disruptions around the world, including in the provision and availability of WASH services and products. WASHPaLS conducted three activities in an effort to assess the impacts and gather longitudinal data to enable further analysis and inform programmatic responses.

WASH and COVID-19 trends and futures analysis. USAID RFS's Center for WASH tasked WASHPaLS with assessing the effect COVID-19 on access to WASH services and products in USAID high-priority and strategy-aligned countries. The assessment sought to characterize the current state of affairs and to forecast near-term (6–18 month) trends that could assist governments, donors, and implementers prepare an informed response to the WASH-related impacts of the pandemic. WASHPaLS conducted "deep dives" in seven countries (the Democratic Republic of the Congo [DRC], Ghana, Kenya, Mozambique, Nepal, Rwanda, and Senegal). The synthesis report and country reports are available for DRC, Ghana, Kenya, Mozambique, Nepal, Rwanda, and Senegal.

Ghana WASH and COVID-19 trends. Upon completion of the Ghana deep dive mentioned above, the USAID Ghana Mission requested WASHPaLS to conduct additional research on the impacts of COVID-19 on WASH services in Ghana. The follow-on assessment focused on the operational status of small piped systems in Ghana, particularly the extent and likelihood of service disruptions, and the constraints on government institutions for tracking reimbursement needs and responding to reimbursement requests from small providers. The report can be found here.

COVID-19 longitudinal data collection. Building on the research conducted in the first WASH and COVID task, USAID/RFS tasked WASHPaLS with collecting and presenting available longitudinal data on the effects of COVID-19 on access to WASH services and products in USAID high-priority countries. The task included the collation of available longitudinal data on the impacts of COVID-19 across three priority topics: WASH governance, WASH in households, and small-scale service providers (SSSPs). For each of the three topic areas, WASHPaLS identified indicators common across existing data collection initiatives (16 for governance, 12 for households, 14 for SSSPs). Secondary data collection consisted of aggregating existing, publicly available data that included any of the selected indicators identified during an initial data scan. Primary data collection was used to fill gaps in the availability of data and consisted of quantitative household surveys for the WASH in households topic and mixed-method data collection for the governance and SSSP topics (informant interviews, online surveys). The final report can be found here.

3.0 IMPLEMENTATION RESEARCH

Through extensive desk reviews, in-depth KIIs, and field-based implementation research, WASHPaLS worked with implementing partners to broaden the evidence base on the use and effectiveness of sanitation interventions, including CLTS, MBS, and promotion of hygienic environments for IYC. Component 2 was divided into three research streams:

1. In-depth examination and analysis of CLTS (Task 2.1) that was led by the Aquaya Institute, including an ICT assessment activity led by Tetra Tech (Task 2.1.3);
2. Exploration of MBS led by FSG (Task 2.2); and
3. Design and implementation of field research to improve hygienic environments for IYC, led by FHI 360 (Task 2.3).

Each of the research streams consisted of two sequential phases: (1) an initial literature review or desk review to identify gaps in the evidence base, which was a major focus of Year 1 activities; and (2) a field-based implementation research phase that sought to fill some of the identified gaps.

The WASHPaLS internal Research Working Group, which comprised two external Research Advisors and Technical Leads from the various research streams, met periodically to discuss research findings and to identify opportunities for learning across the three research streams.

(Note that all deliverables and datasets produced by the research are provided in Appendices 1 and 2, respectively.)

3.1 COMMUNITY-LED TOTAL SANITATION

Through collective action, CLTS seeks to transform individual and group sanitation behaviors to end OD. CLTS is one of the most widely deployed interventions to address sanitation gaps in the developing world, having been incorporated into national rural sanitation policy in over 30 countries, with a distinct presence in some form or another in sanitation programming in many more. Yet, despite its rapid mainstreaming as a public health intervention, the evidence base for CLTS—its performance, delivery, impact, and sustainability—is not as extensive as might be imagined. The WASHPaLS desk review (An Examination of CLTS's Contributions Toward Universal Sanitation) synthesized CLTS-related knowledge and best practices in the context of national efforts to change sanitation behavior and deliver improved sanitation services. Key findings from the desk review are summarized below.

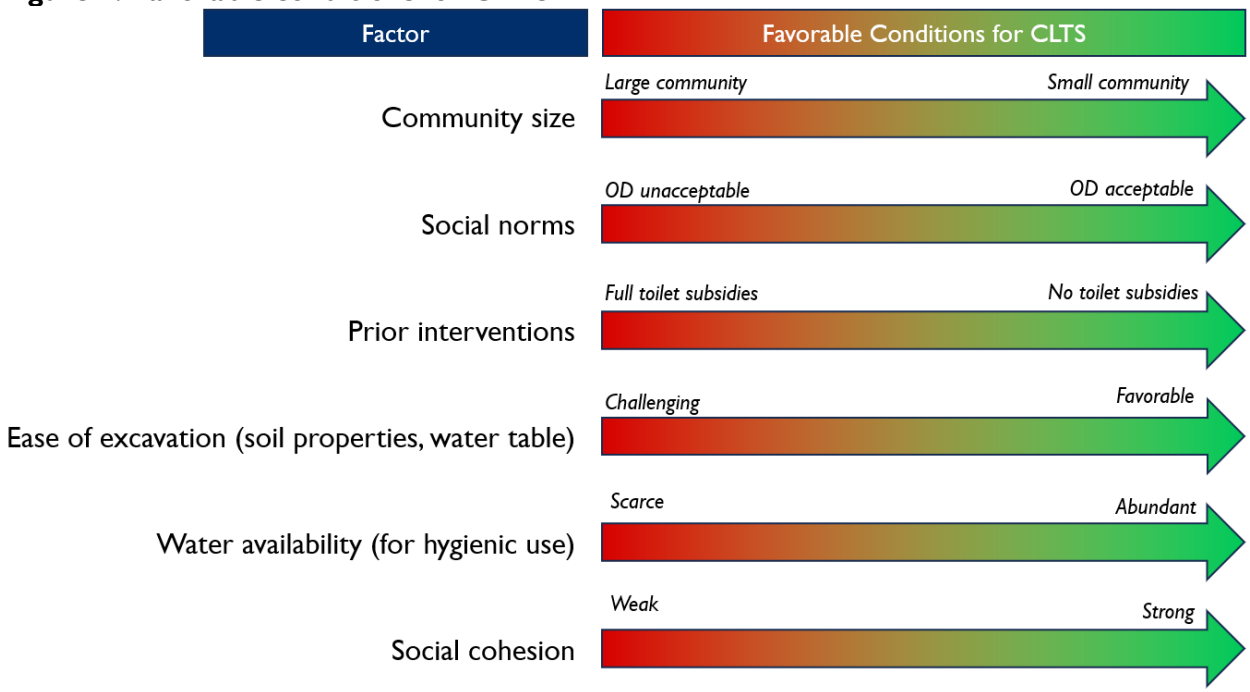
- **A clear understanding of the original objectives of CLTS is necessary to assess its success effectively and avoid unreasonable expectations of what it can achieve.** CLTS was conceived to bring about the rapid elimination of OD—not to expand access to improved toilets or move households practicing fixed-point defecation up the sanitation ladder. Indeed, the available, albeit very limited, evidence suggests that it can be effective at achieving dramatic short-to-medium-term OD reductions.
- **Although CLTS is less expensive than programs that fully subsidize toilet construction, its costs are not negligible and are generally comparable with market-based approaches or targeted subsidies.** Recent literature suggests that CLTS implementation costs in sub-Saharan Africa range between roughly $15 and $30 per household targeted (as opposed to successfully triggered). Other costs, including those for latrine construction, are not included as households bear them. Components of CLTS that are commonly employed, such as hygiene promotion or the recruitment and training of natural leaders, push these costs up considerably, toward $80 per household targeted. Thus, CLTS implementation costs are on par with those of

both MBS and targeted output-based aid subsidy approaches. However, unlike CLTS, these other approaches improve the affordability of improved toilet construction and generally result in higher quality toilets installed: successful MBS programs reduce the costs of products and services required for latrine construction, while subsidy programs reduce the costs borne by the household to access a quality facility.

- **CLTS's exclusive focus on ending OD tends to result in the installation of unimproved toilets, which poses a risk to the sustainability of the behavior change it promotes.** With few exceptions, CLTS programs rarely result in the construction of improved toilets. Therefore, CLTS, in isolation, is unlikely to make significant progress toward attaining Sustainable Development Goal 6.2 (improving access to a safely managed sanitation service). Perhaps more significantly, the lack of high-quality durable toilets resulting from CLTS can increase the risk of slippage and reversions to OD, as households may be unwilling to construct a new latrine following a collapse or once the pit is full.
- **CLTS can and should be integrated with other measures, and that integration can be done strategically to avoid disrupting the collective action process.** The immediate goal of CLTS may be limited to community achievement of ODF status, but broader public health and development objectives demand that households progress up the sanitation ladder. Moving toward improved toilets involves addressing affordability and liquidity constraints, as well as access to markets, which distinctly fall outside the CLTS construct (with its zero-subsidy orientation and avoidance of specific product prescriptions). Therefore, CLTS should be complimented with efforts to help communities gain access to products, services, and information (often accomplished through market-based approaches) and to increase their ability to purchase those products and services (including through well-designed subsidies targeted to the poorest households and the extension of credit). This will allow communities to either construct improved toilets immediately after "triggering" or upgrade down the road.
- **There is a lack of reliable information on CLTS performance with respect to OD reduction and latrine adoption.** CLTS has a data problem. Output metrics used to assess CLTS program performance, such as ODF status, are not consistently defined, applied, or presented. The results put forth by independent studies and reports of CLTS program performance diverge widely from those released by individuals, organizations, and institutions with a stake in reporting successes: controlled studies have detected modest declines in OD and increases in latrine coverage attributable to CLTS, whereas programmatic reports routinely describe much greater reductions in OD. Without reliable data, it is impossible to draw conclusions about the best ways to employ and adapt CLTS to maximize its effectiveness, as well as the conditions that require other approaches. Obtaining reliable estimates on CLTS performance requires the harmonization of output metrics and independent data collection.
- **Follow-up appears to be a strong determinant of both significant OD reductions and sustained behavior change.** Though there is considerable anecdotal attention dedicated to the quality of facilitation, frequency of visits and follow-up, and other variables of CLTS deployment, compelling evidence of the importance of each of these elements on CLTS implementation quality is limited. However, recent high-quality studies of CLTS performance suggest that "heavier touch" implementation (more active community engagement, more follow-up visits) results in superior outcomes. There is also some evidence of improved outcomes through the engagement of influential community members ("natural leaders") and traditional leaders in follow-up and message reinforcement, although their success and appropriateness appear highly context specific. Despite the apparent importance of follow-up, most programs lack the long-term budget and capacity necessary to support it.

- **Government commitment is essential.** While most financial support for CLTS comes from bilateral and multilateral institutional donors working through NGOs, these institutions should not work in isolation from governments. Governments, in turn, must be willing to contribute personnel and other resources to support national CLTS programs. Given the time-bound nature of donor support, the long-term success and sustainability of CLTS programs will rely largely on the willingness of governments to assume much if not all the costs and responsibilities of implementation, follow-up, and monitoring.
- **The success of CLTS depends not only on program design and implementation quality, but importantly on both physical and social/cultural conditions.** CLTS has a PE, wherein success is most likely where (1) communities are small, (2) OD is widespread, (3) full toilet subsidies have not previously been offered, (4) environmental conditions are favorable (i.e., manageable soil properties for pit excavation and adequate water supply for hygienic use), and (5) social cohesion is strong (see Figure 1). These conditions should not be thought of as exclusionary; instead, policymakers should consider them when deciding upon program modifications, the implementation of complementary measures, and CLTS prioritization in the context of other policy options.

Figure 1. Favorable conditions for CLTS



- **Even when CLTS interventions fall short of the installation of hygienic latrines, the behavior change achieved may be sufficient to improve health; however, further research is needed.** An important area of CLTS-related public health research moving forward is to determine whether unimproved latrines—which are overwhelmingly the ones installed as a result of CLTS programs—are sufficient to achieve and sustain health gains. To assess whether reductions in diarrhea, stunting, and parasitic infections are possible from unimproved latrines in a given context, attention should be paid as to whether these rudimentary pits can be kept sufficiently clean and fly-free.
- **CLTS does not always benefit the poorest households and marginalized groups.** Successful CLTS programs do not always benefit all households equitably. The poorest households can often only afford poor-quality latrines that are prone to collapse or that discourage use. In turn,

a poorer household's difficulty in constructing a toilet that they are both able and willing to use over time renders them disproportionately targeted by sanctions or stigma that may emanate from the desired shift in social norms. Additionally, CLTS programs may have the potential to exacerbate imbalances for marginalized groups when those groups are underrepresented or lack sufficient voice during triggering events and community-level planning.

Building on the findings of the desk review and in consultation with USAID and sector stakeholders, WASHPaLS research on CLTS implementation focused on two thematic areas: (1) understanding the impact of targeted subsidies post-ODF to improve coverage of improved latrines, and (2) understanding the contextual factors that affect the achievement of CLTS outcomes.

3.1.1 TARGETED SUBSIDIES

WASHPaLS partnered with the GOG-UNICEF sanitation program and two District Assemblies in Ghana's Northern Region (Tatale and Kpandai districts) in the design and implementation of a subsidy study to examine whether subsidies targeted at the poorest and most vulnerable community members may serve to improve the sustainability and equity of sanitation gains from CLTS. In alignment with the Ministry of Sanitation and Water Resources' June 2018 "Pro-Poor Guidelines," the GOG-UNICEF program offered a subsidy to vulnerable households within ODF communities in the two districts to construct durable toilets acquired through the local sanitation market. This provided WASHPaLS the opportunity to layer a RCT experiment on UNICEF programming.

The objective of the study was to determine whether targeted post-ODF subsidies improve the outcomes of CLTS programs. To achieve this objective, the study addressed three research questions:

1. To what extent do targeted subsidies result in higher latrine ownership, quality, and usage among the most vulnerable households?
2. To what extent do these benefits spill over to the rest of the community?
3. What are the costs and challenges of implementing a post-ODF targeted subsidy program?

WASHPaLS utilized a community consultation process to identify eligible poor and vulnerable households. District Assembly officials facilitated community meetings aiming to identify households that:

- Were unable to feed themselves throughout the year; or
- Included a vulnerable person (elderly person over 65 years of age, person with a severe disability or chronic illness preventing work, widow, orphan, or household head below 18 years of age) receiving no support from relatives.

The voucher-eligible households displayed more characteristics indicative of socio-economic vulnerability than ineligible households. For example, eligible households were more frequently headed by a woman or a person with no primary education and were more often in the bottom two wealth quintiles based on an asset index**.** Overall, these statistics validate that eligible households were poorer and more vulnerable than the rest of the community, suggesting that community consultations accurately targeted the most vulnerable households. Notably, however, baseline sanitation characteristics of eligible households were comparable to those of ineligible households, with similar proportions practicing OD and not owning a functional toilet. Accordingly, identifying the poorest and most vulnerable households is not necessarily equivalent to identifying households that lack a functional toilet or practice OD.

In treatment communities, eligible households received a voucher enabling them to select one of three durable toilet substructure options to be installed by local artisans; all options included a durable slab, pit lining, and ventilation pipe. Compounds with multiple eligible households only received one voucher (the household meeting the highest number of vulnerability conditions was selected). The three durable

substructure options were the Digni-Loo (plastic slab and pit lining), pre-cast concrete, or masonry. All eligible households redeemed their vouchers, with a roughly equal selection of toilet type across the three options. Households were responsible for digging the pit and building the superstructure themselves or with help, while the construction of the substructure was fully subsidized. The program paid artisans on a performance basis: 40 percent of the contracted fee as a down payment, 40 percent after completion and quality control (with the District Health Environmental Officer and District Engineer verifying that the substructure met quality standards and the superstructure was complete), and 20 percent after two months with no reported structural issues. Ninety-eight percent of toilets passed the final verification stage. No household received a voucher in control communities.

The research team surveyed all households in study communities before and after the voucher program was carried out (5,615 baseline surveys were conducted between March–June 2019, and 5,863 endline surveys between November 2020–March 2021). Below are some of the key findings from the study:

- ***The team found that sanitation conditions in study communities had deteriorated considerably between baseline and endline, with increasing levels of OD and reduced ownership of functional toilets, primarily due to toilet collapse (substructure, superstructure, or both).*** For example, in control communities, which had previously been declared ODF, 25 percent of households reported practicing OD at baseline compared to 69 percent at endline. The subsidy program attenuated this decline in treatment communities to some degree; OD increased from 25 percent at baseline to 54 percent at endline.
- ***The program had a substantial impact on households that were eligible to receive vouchers, increasing this group's toilet ownership and use (especially regarding toilets with durable substructures) and reducing OD significantly more than those in control communities.*** Among voucher-eligible households in treatment communities, OD declined from 25 percent at baseline to 18 percent at endline, compared with an increase from 28 percent at baseline to 68 percent at endline among the same group in control communities. Similarly, voucher-eligible households that owned functional toilets in treatment communities increased from 59 percent at baseline to 75 percent at endline (while dropping from 56 percent to 21 percent in control communities). While no voucher-eligible households in treatment communities owned durable toilets at baseline, 70 percent did at endline (compared with none in control communities).
- ***Non-eligible households in treatment communities also benefitted through sharing of subsidized toilets if a voucher-eligible household lived in the same compound. Beyond that, the team found limited evidence of subsidy spillover, as very few non-eligible households upgraded to a durable toilet.*** In treatment communities, non-eligible households owning a durable toilet increased from 2 percent at baseline to 6 percent at endline, compared with values of 1 percent at baseline and 2 percent at endline in control communities.
- ***The research team compared the cost-effectiveness of implementing CLTS followed by this subsidy program with that of implementing CLTS alone. The team found that the combination benefitted more households, though at a higher cost per household.***

Overall, the sanitation declines observed in study communities suggest that approaches in addition to CLTS are needed to sustain reductions in OD and that latrine durability may be a key limitation of stand-alone CLTS. The subsidy program helped to attenuate the overall deterioration but failed to jumpstart local sanitation markets, likely because many durable latrine products remain unaffordable. Increasing the proportion of households eligible to receive some form of assistance soon after ODF status (e.g., by adding eligibility criteria that align with sanitation inequities) or strengthening sanitation markets with more affordable and durable products may generate greater impacts toward durable toilet installation and use, helping to maintain the gains achieved through CLTS programming.

3.1.2 PERFORMANCE ENVELOPE

Both contextual and implementation factors can bear upon CLTS program performance and success, forming a "performance envelope" of factors under which the intervention is more likely to succeed. Examining these factors carefully offers insights for improving decision making on where and how CLTS programs are delivered in the future. Through the CLTS PE research activities, WASHPaLS examined how local context and program implementation strategies affect CLTS outcomes across multiple countries. This research sought to provide governments, donors, and implementing organizations with insights to (1) better target CLTS activities to areas with the highest likelihood of success, and (2) adapt implementation strategies to maximize the chances for their success and sustainability.

The research answered two overarching questions: (1) what contextual factors outside the control of implementers influence CLTS success? and (2) what implementation strategies are successful at achieving and sustaining sanitation gains? For Question 1, WASHPaLS employed a quantitative approach to analyze large CLTS implementation datasets in four countries (Cambodia, Ghana, Liberia, and Zambia). For Question 2, the team employed a qualitative approach to allow for in-depth investigation of community-level dynamics in two countries (Cambodia and Ghana).

Key takeaways. The quantitative research demonstrated that there is indeed a set of contextual factors associated with CLTS performance (both positive and negative) irrespective of the implementation approach, but that the set of favorable contextual factors is country specific. One exception was small community population size, which was consistently associated with CLTS success in all four study countries. Similarly, in the qualitative research, WASHPaLS found that successful implementation strategies leading to sustained sanitation improvements varied substantially between the two case study countries, and that strategies that have a positive influence in one country can have a negative influence in another, such as the involvement of community leaders.

Quantitative analysis. WASHPaLS addressed Question 1 by first collecting datasets of CLTS program outcomes from implementing partners in Zambia (Akros/Ministry of Water: 20,398 communities), Cambodia (Plan International: 2,273 communities), Ghana (UNICEF/GOG and Global Communities: 3,772 communities), and Liberia (Global Communities: 2,030 communities). Following data cleaning and processing, the research team coupled these datasets with publicly available information derived from satellite imagery, surveys, and hydrogeological models to quantify associations between 18 contextual factors and ODF achievement. One implementation factor (the number of reporting periods over the longitudinal record) was included in one country—Zambia. The team also examined correlations between contextual factors and ODF sustainability in Zambia.

The research team found that publicly available, high-resolution datasets on accessibility, socioeconomic, and environmental factors can be leveraged to gain insights on the potential success of CLTS interventions. The contextual predictors of CLTS performance varied among countries, with the exception of community population size: small communities were more likely to achieve ODF in every country studied. Beyond community size, the influence of factors evaluated differed both between countries and performance metrics (ODF achievement and ODF sustainability). Remoteness and literacy were associated with CLTS outcomes, but the direction of association differed across the four countries, though higher remoteness was generally favorable in all three African countries. A detailed technical description of this work is provided in "Where does CLTS Work Best? Quantifying Predictors of CLTS Performance in Four countries" by Kara Stuart et al. (2021).

To translate findings into practical guidance for CLTS implementers, WASHPaLS identified favorable contextual conditions derived from "split point" values. Split points are estimated threshold values for favorable contextual factors. To improve cost-effectiveness, implementers can use split point values to identify areas where CLTS interventions are more likely to have the highest probability of success and can consider other approaches in areas likely to have lower probability of success. This research has

also illuminated quality issues with CLTS monitoring data collected by partners, and avenues for improvement to promote future analyses.

Qualitative analysis. The research team qualitatively examined community-level implementation factors linked to two outcome metrics—high latrine coverage and consistent use—in communities that participated in CLTS programs at least two years prior in Cambodia and Ghana. The team applied fuzzy-set Qualitative Comparative Analysis (fsQCA) to data collected from 13 communities in Cambodia and 15 communities in Ghana to understand successful CLTS implementation strategies related to follow-up, involvement of local leaders, and pro-poor support. The fsQCA approach allowed for a structured, qualitative approach to analyzing case studies that include both qualitative and quantitative data, with the goal of identifying key factors that influence a pre-determined outcome. In Cambodia, latrine coverage was highest in communities whose commune officials and traditional leaders combined active engagement with less prescribed and gentler strategies for promoting latrine construction. Latrine use was less consistent among communities with intense pressure from commune and traditional leaders, less follow up, and more external financial support. In contrast, in Ghana, very active traditional and natural leaders (community members who volunteer to be "champions" for CLTS), high follow-up by CLTS program facilitators, high levels of internal support, and continued follow-up activities by natural leaders were all linked to higher latrine coverage and use. Marked differences in responses to CLTS programming between Cambodia and Ghana indicate that rural communities do not react equally to sanitation behavior change interventions. Understanding and accounting for community reactions to CLTS implementation strategies is critical for fostering long-term sustainability beyond short-term achievements. "How Do Rural Communities Sustain Sanitation Gains? Qualitative Comparative Analyses of Community-Led Approaches in Cambodia and Ghana" by Jessica Tribbe et al. (2021) provides further description of this work.

The exact analyses conducted in this study may not be practical for implementers to recreate without reliable, clean data on program outcomes and the capacity to conduct rigorous statistical analysis. However, this study demonstrates that such an analysis is possible and offers opportunities for more context-specific programming using data. The country-specific nature of favorable contexts and implementation strategies should encourage sanitation planners, funders, and implementers to collect and utilize monitoring data more carefully along with contextual data to maximize CLTS performance in their specific country context. It is equally important to tailor implementation strategies to those contexts. Implementers should pay particular attention to the collection of baseline data (prior to triggering events) and include GPS locations and dates along with all records.

3.1.3 RURAL SANITATION COMMUNITY CLASSIFICATION (SANPLAN) TOOL

As a follow-on to the PE study, WASHPaLS identified an opportunity to develop a community classification tool to support the grouping of communities as defined in the RRSG, developed by UNICEF, WaterAid, and Plan International, which classifies communities into typologies based on their level of remoteness and accessibility.

The resulting Sanitation Planning Tool (SanPlan; www.sanplan.app) supports consideration of contextual factors in sanitation program planning. SanPlan has five main functionalities: (1) rural typology classification (both at 1 kilometer [km] and 5 km resolution), (2) 5 km area pixel-level contextual analysis with 13 variables, (3) administrative boundary-level contextual analysis, (4) user-added community situating (using user-uploaded community locations), and (5) estimated settlement mapping. The tool includes data on 16 countries.

WASHPaLS investigated requirements for long-term maintenance and sustainability of the online tool, including costs to support the tool at-scale (i.e., with multiple users and datasets), and options for where the tool should be accessed online after the conclusion of the WASHPaLS project. WASHPaLS developed a sustainability plan outlining both annual basic maintenance costs (including infrastructure

such as servers and databases, and maintenance costs such as staff time) and options and costs for future product development. SanPlan code and user documentation is available on GitHub.

3.1.4 ICT EFFORT IN ZAMBIA

WASHPaLS conducted a landscape assessment of ICT solutions applied to WASH, with a focus on sanitation programs and CLTS, and other non-WASH development areas (health and agriculture, among others). This included a comparative analysis of 30 different tools, as well as KIIs from UNICEF, WaterAid, Akros, East Meets West, and solution providers such as mWater and Akvo. The landscape assessment was disseminated on GlobalWaters.org.

WASHPaLS followed with an in-depth country case study examining the use of ICT to monitor CLTS implementation in Zambia. Akros, a local Zambian organization, designed and implemented a Mobile-to-Web (M2W) platform under the Department for International Development (DFID)-funded Zambian Sanitation and Hygiene Program (ZSHP), which was implemented by UNICEF from November 2011 to September 2018. ZSHP implemented the M2W platform in partnership with the Ministry of Local Government and Housing, which transitioned to the Ministry of Water Development, Sanitation, and Environmental Protection (MWDSEP) in 2016. The M2W platform built upon existing sanitation service delivery structures by adding mobile data collection and reporting tools to report latrine construction rates at the community level in 68 districts of nine provinces. These tools allowed greater access to community-level sanitation data across a wide spectrum of stakeholders.

Akros transferred the M2W platform to MWDSEP control shortly before the close of ZSHP in mid-2018. Akros worked to establish a data-driven decision-making culture and engaged in capacity building at multiple levels. While M2W was still in use as of mid-2018, the system faced sustainability questions due to burdensome monthly reporting structures that contributed to increased error rates. The M2W platform provided learning for the Zambian context as well as a broader digital development community on the challenges of implementing a data-driven program at scale, on donor-funded timelines, in the face of significant institutional transition.

Akros and UNICEF worked to build a culture of data-driven decision making, which represents significant behavior change across a broad array of stakeholders. Introducing technologies to a previously largely paper-based system requires careful identification of champions and changemakers to help push and facilitate change, and UNICEF and Akros worked to build capacity at multiple levels. Working with traditional authorities, developing a network of real-time monitoring coaches, seconding central-level staff, and providing hands-on training for district-level committee members involved in sanitation service delivery all contributed to change. Akros also structured their program delivery to ensure a phased approach to district capacity building, built detailed systems and documentation and escalation pathways, and engaged in regular pause and reflect.

Despite the programmatic structures that Akros implemented to facilitate sustained change, implementation of technology-enabled programs bear additional challenges as technology changes significantly over a five-year period. Akros made technology decisions, both hardware and software, which may have been appropriate in the moment, but did not weather the test of time well. This resulted in Akros handing over an aging M2W system to a ministry with limited human resources. Some of these decisions might have been mitigated using a total cost of ownership exercise that would have accounted for costs contributing to design, development, deployment, and maintenance of a technology platform.

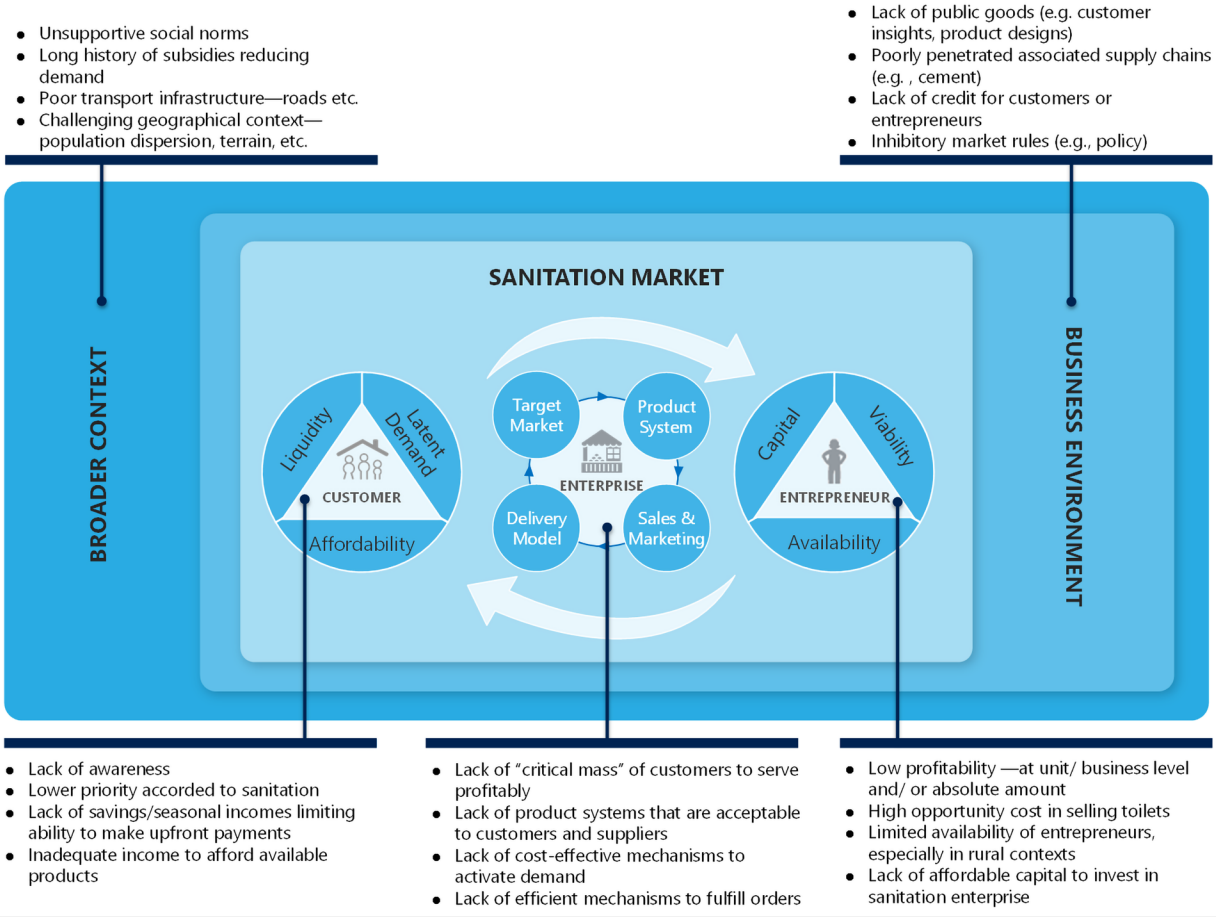
3.2 MARKET-BASED SANITATION

MBS—through which users make full or partial monetary contributions (with savings and/or cash equivalents) toward the purchase, construction, upgrade, and/or maintenance of a toilet from the private

sector—is a promising approach toward achieving Sustainable Development Goal 6.2. 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, where the need is great. The objective of WASHPaLS MBS research was to better understand the barriers to scaling MBS interventions and improve programming globally.

WASHPaLS prepared a desk review that captured the state of knowledge in MBS based on a survey of approximately 600 documents, 13 MBS case studies across the global south, and numerous interviews with sector experts and program personnel. The desk review introduced the sanitation market system framework (Figure 2), a tool to conceptualize the sanitation market system through which funders and implementers can analyze, design, and prioritize MBS interventions. The framework consists of three distinct yet interrelated domains: (1) the core sanitation market, wherein a sanitation enterprise facilitates transactions between customers and entrepreneurs; (2) the business environment shaped by government policy, the reach of associated supply chains for raw materials and equipment, access to credit, and the availability of public goods; and (3) the broader context, such as social norms, infrastructure, and macroeconomic and environmental factors.

Figure 2. The *Sanitation Market System Framework* and common barriers to scaling MBS



Barriers to scaling MBS exist across each of the domains. Considering these barriers is important when assessing the appropriateness, scale, and design of MBS interventions.

Customers. Market potential for sanitation products and services is limited by barriers to customer participation, including (1) inability to afford existing products (the "affordability" barrier); (2) a lack of

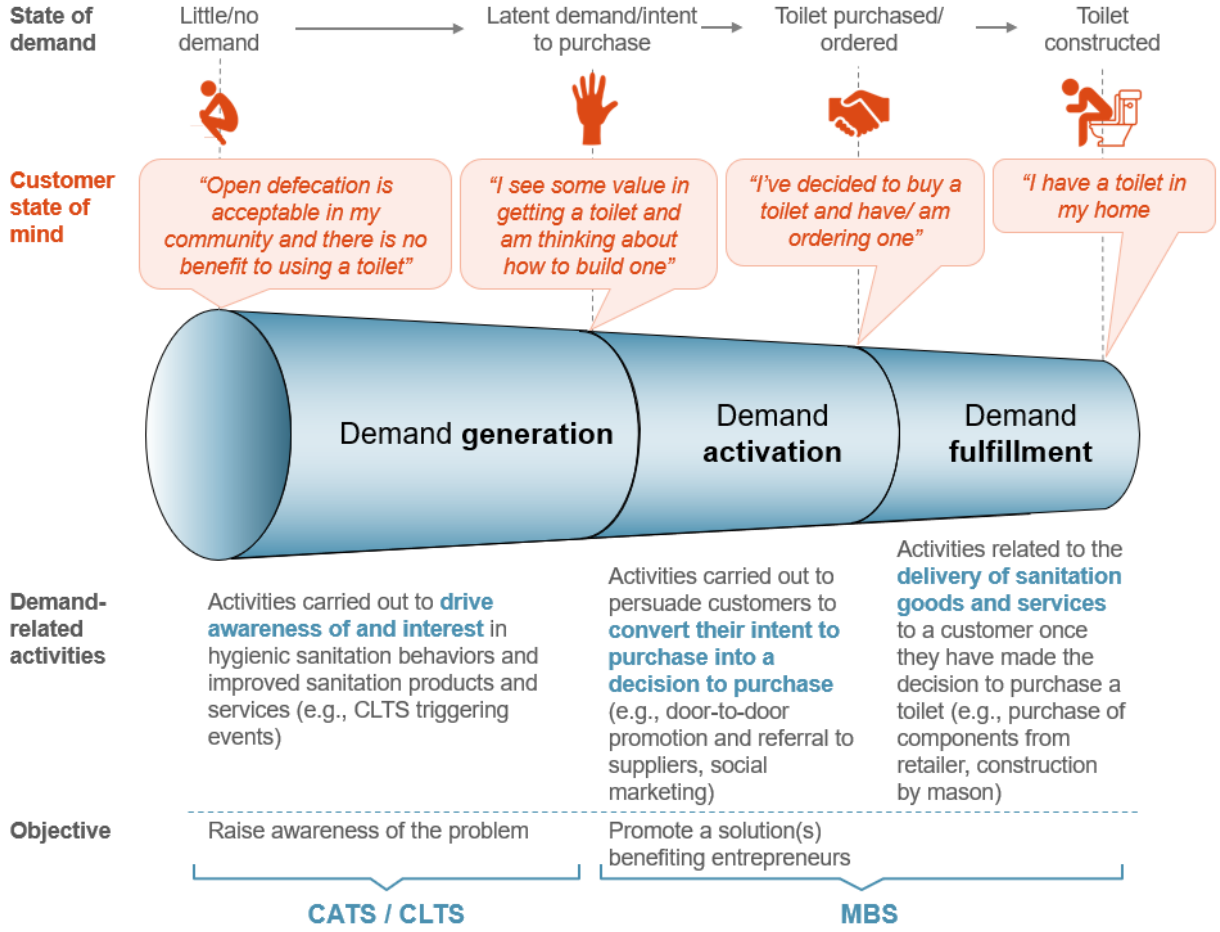
liquidity due to unstable, seasonal cash flows (the "liquidity" barrier); and (3) a lack of active demand despite interest in purchasing a toilet (the "latent demand" barrier).

- ***Subsidies may be required to improve affordability for the lowest-income households.*** Even when well designed, purely MBS programs are unlikely to reach the lowest-income households. Assuring that these segments have access to basic sanitation facilities may require a subsidy program to complement MBS efforts. Subsidies should be well targeted to the poor to avoid market distortion and ensure the efficient use of government and donor funds. When designing a subsidy program, four interconnected and overlapping elements should be considered: form, timing, channel, and amount. Numerous subsidy targeting methods exist, each of which entails different levels of expense and administrative capacity: means-tested targeting, community-based testing, geographic targeting, and self-selection. The applicability of each method varies by context.
- ***Due to uneven cash reserves and cashflow, customers may require credit to overcome a liquidity barrier.*** The liquidity barrier is distinct from the affordability barrier faced by the lowest-income households. When designed properly, most households in a given segment will be able to afford a product package, but some may require loans to make the net lump-sum payment often required for a toilet purchase. Microfinance institutions (MFIs), for example, have effectively extended credit to customers who wish to invest in toilets. However, the review suggests that credit providers face challenges in loaning capital to customers for sanitation purchases related to the risk of default, and the difficulty of ensuring that sanitation loans are used as intended. Channeling the loan through sanitation enterprises can ensure that loans are used toward sanitation, while subsidies in the form of risk guarantees or grants toward operational costs can incentivize credit providers who are reluctant to provide sanitation loans. Similarly, community-based organizations can facilitate group lending mechanisms that increase the financial resources available to customers while also imposing social pressure on borrowers to repay.
- ***In some markets, raising latent demand is a precursor to MBS.*** As shown in Figure 3 (next page), demand generation activities such as CLTS may be required in some market segments (beyond the early adopters) before or in conjunction with MBS to stimulate household interest in altering their sanitation behaviors. Once latent demand is present, households may then develop the intent to purchase a toilet by taking specific actions, such as saving money and identifying product and supplier options, which signals their receptivity to demand activation activities delivered as part of the enterprise design.

Entrepreneurs. Three significant barriers impede entrepreneurs from investing in the sanitation market: (1) a lack of viability ("viability" barriers); (2) a lack of access to capital, which hampers entrepreneurs' ability to start and grow sanitation enterprises ("capital" barriers); and (3) a lack of qualified commercial actors ("availability" barriers).

- ***Low turnover and unit profitability are often the major challenges to the viability of rural sanitation enterprises.*** In many markets, particularly in rural areas, sanitation is a seasonal business with customers only having disposable income during certain times of the year (e.g., harvest season), rendering standalone sanitation enterprises unviable. In such contexts, however, sanitation can be a productive part of a diversified business with multiple product or service lines and can even create sales opportunities for entrepreneurs' other businesses (e.g., raw materials and hardware components for home improvement). Viability can also be enhanced by expanding product or service coverage to adjacent areas, thereby targeting new customers. For this approach to work, the product system must be easy to transport, and new areas should be serviceable by existing road infrastructure. While product innovations can lower costs, sanitation enterprises may adopt a low-margin, high-volume strategy that results in lower unit prices, higher volumes, and increased net profit.

Figure 3. The phases of demand for household sanitation



Note: *CATS = community approaches to total sanitation; CLTS = community-led total sanitation*

- ***Finance for sanitation enterprises is still relatively new, but several delivery mechanisms have proven successful.*** The small and informal nature of many sanitation enterprises, their lack of collateral, and the inherent risks of the market often deter MFIs and banks from investing in the sector. However, these concerns can be reduced when entrepreneurs obtain loans based on their other less risky, non-sanitation businesses. Additionally, as with consumers, donors or external interveners can guarantee enterprise loans or provide subsidized loans to a lender, who in turn lends that money to sanitation enterprises. In other contexts, upstream suppliers, such as distributors and retailers of materials, have extended trade credit to sanitation enterprises. In a few cases, impact investors have begun lending to sanitation enterprises that are generally too big for microfinance but too small or risky for commercial credit under flexible terms.
- ***Management deficiencies can be addressed by attracting successful entrepreneurs from other sectors.*** The requisite skills and capabilities necessary to run a sanitation enterprise are not unique, and entrepreneurs in similar markets (e.g., those with experience managing product-oriented enterprises) can often serve as a successful focal point in the sanitation market. Since sector-specific knowledge can be taught, implementers should prioritize highly competent entrepreneurs that possess capital, tolerate risk, aspire to run and grow their business, and exhibit essential entrepreneurial skills (e.g., sales, business acumen). Implementers can then assist them in acclimating to the sanitation market through additional sector-specific support, such as training in production

methods or coaching on viability strategies (e.g., lowering margins, cross-selling products and services).

Sanitation enterprise. The enterprise is at the center of the sanitation market (Figure 2). It is the consumer-facing business that delivers goods and/or services to a paying customer and provides a financial return to the entrepreneur(s). The sanitation enterprise consists of four core elements: (1) the target market, (2) the product system, (3) sales and marketing, and (4) the delivery model. Elements of the sanitation enterprise interact with each other and act upon some of the barriers to greater customer and entrepreneur participation. The design of the sanitation enterprise is an iterative process, but ideally, the process begins with target market selection. Below are brief descriptions of each of element that makes up the sanitation enterprise.

- ***Successful sanitation enterprises identify and target early adopters before expanding into harder-to-reach market segments.*** MBS interventions that have attained scale began with in-depth consumer research to define target market segments rather than aiming to reach all customers simultaneously at the onset of the intervention. In contexts with nascent sanitation markets, customer segments should be grouped according to common identifiable characteristics and prioritized based on (1) demonstrated interest in building, upgrading, or replacing a toilet; (2) willingness and ability to purchase toilets with savings and/or cash equivalents; (3) accessibility by local suppliers; and (4) product preferences that can be met using available technologies/materials in existing supply chains. By targeting "early adopter" households, implementers can both drive the acceptance of new sanitation enterprises and toilet designs by the wider market and demonstrate to potential entrepreneurs the viability of diversifying into sanitation. Once established, in successive phases or "sweeps," enterprises can gradually expand to more difficult market segments.
- ***Designing locally relevant product systems helps to boost acceptance and reduce production costs.*** In designing product systems for the chosen target market, implementers should adopt an iterative approach, such as human-centered design that considers both customer preferences and entrepreneur capabilities. Introducing radically new product designs that either require substantial customer education or increase production complexity can be risky. Reengineering products and promoting efficient production methods that make use of existing supply chains and capabilities is generally more effective. Notably, standardizing core elements of a toilet (e.g., substructure and interface components) can simplify manufacturing processes and reduce capital investment for sanitation entrepreneurs. While different product variations may be necessary to cater to the specific needs of different sub-segments within the target market, it is important to avoid complicating customers' decision making with too many choices.
- ***Dedicated sales efforts are necessary to activate latent demand for toilets.*** Latent demand, a prerequisite for successful MBS interventions, is influenced by socio-cultural norms and can be fostered through demand generation activities (e.g., CLTS) that seek to raise awareness of the benefits of sanitation and generate interest in purchasing toilets. Yet, the research suggests that households require additional sales and marketing efforts, known as demand activation, which convert their intention into a purchase of a new or upgraded facility (Figure 3). One-way marketing such as radio and print advertising alone are generally ineffective in persuading households to purchase toilets. Demand activation is best accomplished through interpersonal communication using independent actors. Demand activators should be compensated by the sanitation enterprise to ensure sustainability beyond the timeframe of the intervention. Enterprises may establish partnerships with local actors such as local government representatives, community organizations, or influential community members that have non-pecuniary interests in promoting sanitation to play the role of the demand activator.
- ***The choice of product delivery model has significant implications on customer acceptance and costs to the enterprise.*** As Figure 4 depicts, a range of toilet delivery models are possible,

from a decentralized do-it-yourself (DIY) model to the full aggregation of all products and services under one business acting as a turnkey solution provider (TSP). Higher levels of aggregation reduce the number of transactions and interaction points for customers, which may increase convenience and enhance the supply of quality toilets but may also increase costs. A common pitfall in designing sanitation delivery models is assuming the TSP is preferred over the others. Delivery models are highly context specific; no one size fits all. With that said, the research shows that successful delivery models typically support a customer-facing focal point enterprise that aggregates products, services, information, or a combination of these, to reduce the number of transactions required by the customer to acquire the product desired. Ultimately, the delivery model is refined through iterative trials of short-cycle learning and adaptation with entrepreneurs in each context. Setting up viable and sustainable sanitation enterprises that collectively achieve scale requires a long-term engagement. Successful MBS programs have taken four to six years to accelerate sales, with between 70 to 90 percent of the total number of toilets sold occurring in the second half the interventions studied.

Figure 4. Examples of common toilet delivery models

Note: *In a DIY 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. The network delivery model involves a loose affiliation of players that each sell one or more components, with any player capable of serving as a focal point enterprise that connects customers to other providers/artisans for procuring the remaining inputs and/or constructing the toilet. In the OSS model, the focal point business goes beyond material/information aggregation by fabricating key toilet substructure and interface components (e.g., concrete pit rings, slab with integrated pan) through ready-to-install packages wherein the customer arranges for installation services separately. Finally, a TSP aggregates the full range of products (including substructure, interface, and superstructure) and services (including delivery and installation), at a higher cost.*

Based on findings from the literature review and an analysis of the multiple barriers to scaling MBS interventions, WASHPaLS focused the MBS implementation research on two themes: the viability and sustainability of sanitation enterprises and DSTs for policymakers.

3.2.1 VIABILITY OF SANITATION ENTERPRISES

To understand how sanitation enterprises could be made viable (achievement of a level of profit sufficient to justify entrepreneur time and investment) and sustainable (the ability to maintain viability over time), WASHPaLS carried out retrospective analyses of sanitation enterprises in partnership with MBS programs in Cambodia (WaterSHED's Hands-Off project), India (Population Services International's

Supporting Sustainable Sanitation project in Bihar State, India), and Nigeria (WaterAid's Sustainable Total Sanitation project). As part of this research, the team realized that few, if any, MBS programs were tracking the financial performance of sanitation enterprises. To fill this essential knowledge gap, WASHPaLS interviewed over 60 sanitation enterprises in the three countries to build detailed financial statements and to understand better their business practices. The research team undertook comparative analyses of enterprises to identify the contextual and strategic choice factors that drove differential performance within the same MBS program. Below are several key findings from the retrospective study:

- ***Five key drivers can explain the differences in financial performance, and by extension, the viability of sanitation enterprises: number of customers, price of products, cost to produce, mix of products, and availability of additional sanitation-related products.*** WASHPaLS found that the profit drivers and the underlying business practices necessary to activate the drivers interacted with one another and involved tradeoffs.

- ***The sustainability of sanitation enterprises is at risk when enterprises are financially or operationally dependent on MBS programs due to the program's design or actions.*** In situations where enterprises had not fully accounted for or internalized costs subsidized by programs (e.g., sales commissions to demand activators), their sustainability was at risk because their profitability would erode or had reduced once non-market financial support ended.

  From the research on understanding the drivers and business practices that underlie improvements in viability and sustainability, the team offered recommendations for implementers of MBS programs in the hope that enterprises continue to flourish following the close of the MBS intervention.

- ***Recruit entrepreneurs with existing, related businesses to start sanitation enterprises as a business line.*** In the early stage of an MBS program or when targeting new markets, implementers should encourage entrepreneurs with existing businesses to diversify with sanitation enterprises. This tactic contrasts with the historical practice of persuading artisans to start and operate sanitation enterprises as a standalone business. Among existing businesses, implementers should prioritize those related to sanitation in terms of capabilities (i.e., financial capacity, managerial or technical skills), supply chains, and/or customers. Examples of sanitation-related businesses are concrete product manufacturers, hardware stores, and building materials suppliers, who are likely to have an existing direct or indirect role in sanitation markets.

- ***Guide enterprises in choosing a strategic path to improve viability that appreciates their capabilities and constraints.*** Implementers need to understand the profit drivers and underlying factors differentiating the better performing enterprises from their peers in their target markets to develop contextually appropriate strategic paths to increase profit.

- ***Recognize that some (indeed many) sanitation enterprises may not have a viable or scalable proposition.*** Some enterprises, however, might not have the resources or supportive micro-market conditions, or the entrepreneur may lack the motivation to grow or improve profits (for the sanitation enterprise). Implementers should recognize such limitations while recruiting and supporting sanitation enterprises.

- ***Facilitate the development of a sanitation market system instead of direct participation.*** Implementers should actively build redundancy in their program design by eliminating non-market dependencies early in the program lifecycle. Implementers need to encourage enterprises to assume all costs early, if not from the beginning, of a program. Costs are not only for recurring expenses such as raw materials and sales agents' commissions but also longer-term capital equipment such as molds.

- ***Track enterprise performance metrics beyond toilet sales.*** Implementers of MBS programs would be well served to expand the scope of M&E systems to track enterprise performance metrics beyond sales, which few programs track, if at all. Financial performance metrics such as revenue and profit margins at different levels of a conventional profit and loss statement (i.e., gross, operating, and cash net profit), provide a starting point for implementers to develop a nuanced understanding of enterprises and the strategies that are effective in the contexts in which they operate.

  WASHPaLS developed toolkits to aid implementers track, analyze, and improve the performance of sanitation enterprises and to recruit new enterprises to the sanitation market.

3.2.2 DECISION SUPPORT TOOLS

This line of research relates to understanding how changes in market rules (e.g., legislation, government policy, and regulation) can potentially improve the viability of sanitation enterprises or lead to an increase in toilet sales. Policymakers often rely on precedents or evidence to make decisions about whether to implement a particular policy, but in the context of sanitation markets, such precedents are few, and the evidence base on their efficacy is thin.

To address this, WASHPaLS developed several Microsoft Excel-based decision support modeling tools for sanitation-related policymaking. DSTs are simplified mathematical models of complex systems designed to estimate ranges for potential outcomes of a decision that are based on a theory of causal relationships, a set of corresponding logical and quantitative relationships, existing data, and assumptions. WASHPaLS developed DST models for three sanitation policies with potential for supporting the growth of sanitation markets as examples to demonstrate their utility by estimating their impact on toilet sales and the costs incurred by the government to implement them. The tools enable cost-benefit analyses of changes in market rules in three categories: (1) penalties, such as the denial of service or imposition of a surcharge on higher-income households that do not own toilets; (2) reduction in taxes or tariffs on inputs; and (3) policies that support entrepreneurs in the sanitation market directly, such as limited demand activation financial support.

Applying the models, using publicly available data from Uganda as an example country, WASHPaLS demonstrated that DSTs have the potential to inform sanitation-related policy decisions in three key ways:

1. Evaluate the cost-benefit of a potential range of outcomes of different policies and identify more promising policies and trade-off decisions. Such evaluations provide a cost-efficient alternative to piloting multiple policies, which require more time and resources.
2. Identify and understand the factors that have the greatest influence on policy cost-benefit outcomes and define areas where more or better quality information is needed. Policymakers can request relevant data or commission studies to address gaps, increase their confidence in decisions, and promote policies.
3. Aid planning by estimating the amount and nature of investment required and by whom, and the administrative and human resources required to implement a given policy.

While the primary audience for the DST approach is the government, other stakeholders such as donors, funders, and implementers of sanitation programs can use DSTs to inform their policy advocacy efforts. (The taxes and tariff model was implemented through the Component 1 DST activity in Ethiopia.) Efforts to use DSTs for sanitation policy modeling can generate evidence to improve the efficacy of decision making and potentially contribute to building policy precedents for wider adoption across sanitation markets.

3.2.3 MBS TRAINING MATERIALS

WASHPaLS received several requests for MBS training under Component 1 activities in Ethiopia and Kenya, as well as standalone requests from UNICEF Ghana, WaterAid Nigeria, and the USAID Practices, Research, and Operations in WASH (PRO-WASH) activity. WASHPaLS prepared a training package consisting of eight modules spanning different levels of the sanitation market system. The team repurposed existing materials developed by WASHPaLS (e.g., Introduction to MBS presentation and activity, Designing Viable Sanitation Enterprises game) and the USAID/Uganda Sanitation for Health Activity (USHA) (e.g., designing a product system, delivery models), and created new materials, where required. UNICEF Ghana was interested in using the package at a training session for stakeholders, and therefore, reviewed the contents from the perspective of participants from MBS implementers, government, and private sector organizations. UNICEF Ghana gave positive feedback, including its ability to deliver training independently without WASHPaLS support, by following the facilitation guides and materials in the package.

PRO-WASH requested WASHPaLS to peer review its training package, *Introduction to Market-Based Sanitation for USAID/Food for Peace Implementing Partners: A Facilitator's Guide*, which incorporated concepts and materials from the MBS Desk Review and webinars, and the UNC Water and Health Conference 2019 side-event presentation and game.

3.3 HYGIENIC ENVIRONMENTS FOR INFANTS AND YOUNG CHILDREN

WASHPaLS research on hygienic environments focused on the growing body of evidence suggesting that traditional WASH interventions do not protect IYC adequately from exposure to fecal pathogens during early developmental stages, specifically via the fecal-oral pathway of direct ingestion of animal feces and indirect ingestion of human and animal feces through consumption of soil and exploratory mouthing behaviors. As implementers increasingly recognize the vital importance of interventions to interrupt the infant-specific pathways of pathogen exposure, the lack of solid evidence on the effectiveness of options to guide "best practice" programming is a key knowledge gap. The research focused on adding to the evidence base around use of playmats and playpens as a feasible and appealing protective measure, while keeping a wide-angle lens on the range of options to improve hygienic environments for IYC.

Playmat and playpen interventions may be intuitively promising, but whether caregivers will consider them feasible and appealing for household use, and will consistently and correctly use them are unknown. To this end, WASHPaLS, in collaboration with USAID/Ethiopia, the Amhara (Ethiopia) Public Health Institute, Plan International/Ethiopia, and the USAID Transform WASH Project, conducted behavioral research to determine if it is feasible and appealing for rural households to use and maintain a protective playpen for IYC consistently and safely. The research team assessed feasibility and appeal by providing a playpen along with some behavior change motivation to households and documented use and maintenance, perceived benefits, obstacles to use and maintenance, family and community reactions, and preferred playpen attributes that facilitated use.

The team conducted this research among 31 randomly selected households with an infant seven to 12 months of age and a caregiver 18 years or older. Researchers purposively selected households across 10 selected villages (*gotts*) in two wards (*kebeles*) in Bahir Dar Zuria District of Amhara, Ethiopia. Researchers employed a suite of non-experimental, mixed methods, including household trials of three distinct playpen designs over a three-week period, semi-structured interviews, structured direct observations, testing playpens and household floors for E. coli, and a rudimentary consumer valuation exercise (in the form of a buy-back offer). Central to the approach, known as TIPS, is the consultation with target households to develop and test possible behavioral improvements, often involving the testing and refinement of enabling products, such as a playpen. The TIPS method is built around sequential visits to the same households over a period of time—in this instance, three visits over three weeks—to assess the feasibility of, compliance with, and reactions to a proposed practice and product after their

novelty has faded and households experience them in a routine context. Four group discussions immediately following the TIPS visits brought together study-participant families to compare all playpen models and discuss options for protecting their infants from animal-sourced pathogens and infant-specific pathways of exposure.

The research team collected data from the various complementary methods concurrently, analyzed them separately, and finally interpreted and reported the results together to address research objectives and key themes.

The team introduced three affordable playpen models to assess how particular features contributed to use and appeal. Researchers identified one such playpen (Model A) through Alibaba.com, the world's largest online marketplace. Researchers also convened a user-centered design workshop with farmer parents (falling in the target demographic) to co-design model playpens from locally available materials. The team further refined these for safety and structural integrity, and then fabricated them for household testing as Models B and C. Researchers tested Models A and B in 10 households each, and Model C in 11.

Figure 5. Models of Playpen Tested

Model A, an imported playpen, is lightweight, easily disassembled and portable, with five net sides and one nylon side panel with a zipper-closed door.

Model B, a locally designed playpen, is 1.5 meters square with 3 net sides and 1 canvas side w/door (opened with an extra-large button/string wrap closure), and removable net canopy.

Model C, a locally designed playpen, is a 1.5 x 1.1 meter rectangle with 2 net sides and 2 spinning bottle walls for child stimulation, and 2 cm foam padding.

The study found that playpens were appealing and were used daily by all but one of 31 study households. Households who received playpens perceived an array of benefits, and all chose to keep the playpens rather than accept a cash equivalent at the end of the study (the cash offer was at price point researchers believe to be potentially viable for a scaled-up commercial playpen enterprise).

Caregivers reported keeping vulnerable young children in the playpens for about two hours per day. Researchers did not assess how much time those children spent on dirt floors on a given day. The team also notes that researchers examined only the short-term (three to four weeks) use, acceptability, and appeal of the playpens.

It is unlikely the two hours a day the children spent on the comparatively cleaner surfaces of the playpens resulted in a sufficiently lower exposure to pathogens to result in any measurable health or growth benefit. Families allowed poultry on and inside the playpens, as well as multiple older children with visibly soiled feet and clothing. It is reasonable to expect the playpens to continue to be soiled and their protection against pathogen exposure limited by how clean the families are able to keep them. Based on the results of this study, playpens alone cannot plausibly provide protection to IYC from environmental contamination. Promotion of playpen use would certainly need to be part of a more comprehensive effort to maintain a hygienic environment.

The research team is confident that access to the enabling technology of a playpen, together with promoting a safe zone, bolstered self-efficacy.[1] Playpen users reported an intention to reduce infant mouthing and consumption of fecally contaminated objects; in group discussions at the close of the study, the majority of participants endorsed playpens as an effective strategy for maintaining a safe zone and keeping their infants from mouthing contaminated objects. In both household interviews and group discussions, participants repeated their commitment to use the playpen to prevent children from eating dirt and feces, as well as to keep them safe from other harm. However, despite these public commitments and enhanced self-efficacy, researchers observed many risky practices that could expose IYC to feces in households. Whether the limited time in playpens will mitigate the impact of these practices is uncertain.

WASHPaLS identified other perceived benefits of playpen use for caregivers, IYC, and siblings that are noteworthy. These additional benefits include reduced burden on women, with possible impact on mental health, reduced burden on young girl caretakers, as well as other possible health benefits, such as reduced exposure to cooking emissions that are linked to childhood pneumonia, childhood stunting, and related impaired cognitive development of IYC. These results support further exploration of the potential benefits and commercial viability of scaling up use of playpens in rural, agricultural households as part of a comprehensive approach to IYC development and women's empowerment. For additional details, see "Exploring the use and appeal of playpens to protect infants from exposure to animals, animal feces, and dirt in rural Ethiopia" by Julia Rosenbaum, et al. (2021).

In addition to WASHPaLS' core research into playpens, the project's small grants programs (see Section 4) supported research on additional interventions. Notable among these were an examination of the plausibility of finished flooring to reduce pathogen exposure in Uganda and a study of locally designed poultry coops in Bangladesh. The flooring research is motivated by a 2009 study of the benefits of cement flooring in Mexico[2] as well as a study of finished flooring within the WASH Benefits Trial[3], which indicates strong potential of finished floors to reduce helminth and parasite infections in children. The WASHPaLS-funded work found dust loads to be reduced by 89 percent on floors finished with a novel linseed oil varnish developed by EarthEnable as compared to dirt floors. Meanwhile, the poultry cooping project in Bangladesh succeeded at encouraging poultry-raising households to build an improved poultry shed, confine poultry outside of the household dwelling at night, reduce/prevent poultry feces in the household dwelling, and dispose of poultry feces in a dedicated location.

No single intervention appears to be sufficient as stand-alone measure but should be considered part of an integrated approach for protecting IYC.

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1 WASHPaLS relies on the definition of "perceived self-efficacy" offered by A. Bandura in the Encyclopedia of Human Bahavior, "Self-efficacy: a person's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives." [Bandura, A. (1994). Self-Efficacy. In V. S. Ramachaudran (Ed.), Encyclopedia of Human Behavior (Vol. 4, pp. 71-81). New York: Academic Press]

2 Cattaneo, Matias D., Sebastian Galiani, Paul J. Gertler, Sebastian Martinez, and Rocio Titiunik. 2009. "Housing, Health, and Happiness." American Economic Journal: Economic Policy, 1 (1): 75-105

3 Benjamin-Chung, Jade, Y. S. Crider, A. Mertens, A. Ercumen, A. et al. 2021. "Household finished flooring and soil-transmitted helminth and Giardia infections among children in rural Bangladesh and Kenya: a prospective cohort study", *Lancet Global Health*, 9(3), March. E301-E308, https://doi.org/10.1016/S2214-109X(20)30523-4

4.0 SMALL GRANTS PROGRAM

4.1 OVERVIEW OF THE GRANTS UNDER CONTRACT PROGRAM

The WASHPaLS GUC program was designed to support grantees investigate innovative ideas in WASH behavior change programming and assess the effectiveness of these approaches in expanding the adoption of key hygiene behaviors. Grant funds were used to support the development, feasibility, and testing of innovative approaches to achieving hygiene behavior change, including but not limited to handwashing with soap; animal husbandry; and IYC and animal feces disposal. WASHPaLS sought to fund innovative approaches to improve upon the effectiveness of existing approaches and take into account country programs, policies, and priorities.

The WASHPaLS grants program complemented implementation research under Component 2 and was employed to investigate new behavior-centered approaches (e.g., those focused on habit formation, nudge theory, choice architecture) that are fundamental to achieving and sustaining improved WASH practices and particularly relevant to ODF communities and hygienic environments. Grant themes were identified in close collaboration with the Task Order Contracting Officer's Representative (TOCOR) and other USAID representatives during annual work planning. Grants were issues to US and non-US organizations to carry out activities in one of the 24 USAID-designated high priority countries, primarily in sub-Saharan Africa and South Asia. Recognizing that GESI presents obstacles to full participation and access to WASH services, all grantees were required to conduct a gender analysis and develop a plan to assure GESI considerations in research design, analysis, and reporting; some grants had an explicit GESI focus.

The WASHPaLS contract originally called for the award of a minimum of 10 grants with up to $1.5 million in contract funds available for small grants. Ultimately, WASHPaLS awarded nine grants across multiple countries to investigate the effectiveness of existing and new innovative approaches to improving and sustaining WASH-related healthy behaviors. Per ADS 302.3.4.13, grants to US organizations were limited to a ceiling of $100,000.

4.2 SMALL GRANTS COMPETITION AND AWARD PROCESS

Following consultation with USAID, WASHPaLS settled on a two-tiered application process to evaluate and award grants. The first tier consisted of issuing a Request for Expressions of Interest (REOI), through which eligible organizations were invited to submit a short concept note describing their idea or innovation. Applicants whose concepts demonstrated the most promise to contribute to the project's objectives were then invited to submit a fully developed application (second tier).

The two-tiered application process permitted WASHPaLS to review and screen ideas and organizations efficiently from a large number of applicants and minimize the administrative burden for both WASHPaLS and the applicants. The expressions of interest review served as a filter to identify ideas that would make a significant contribution to the project objectives. It also allowed WASHPaLS to screen applicants earlier on to determine if they were eligible to receive US government funds and if they demonstrated the capacity to manage USAID grants with little to no need for in-country support from WASHPaLS. This process was designed to prevent the Review and Evaluation Committee from spending time scoring full applications that did not meet the minimum public notice standards or were not aligned with the project's technical priority and focus.

WASHPaLS sought to publicize and disseminate each grant opportunity as broadly as possible to promote diversity and inclusion of capable partners beyond established networks. Over the course of the project, WASHPaLS issued three rounds of REOIs, each focused on a different theme, which resulted in eight grant awards, as indicated below. WASHPaLS also issued one sole source grant.

- REOI-001: Habit Formation Approaches and Gender Equity & Social Inclusion Innovations for Hygiene Behavior Change (Released June 2, 2017; three grants issued)
  - Splash (a US organization): *WASH-in-Schools Hygiene Nudges in Ethiopia*
  - International Development Enterprises (iDE, a US organization): *Expanding Women's Role in Nepal's Sanitation Value Chain*
  - International Center for Diarrhoeal Disease Research, Bangladesh (icddr,b) (a non-US organization): *mHealth Messaging: An Innovative Approach to Promote Improved Caregiver and Child Hygiene Practices in Bangladesh*
- REOI-002: Testing WASH Behavior Change Innovations to Reduce Exposure of Infants and Young Children to Poultry Excreta (Released April 20, 2018; one grant issued)
  - icddr,b (a non-US organization): *Household Problem-Solving to Reduce Children's* Exposure to Chicken Feces
- REOI-003: Innovations in Hygiene Behavior Change (Released February 1, 2019; four grants issued)
  - The Water Trust (a US organization): *Improving Hygienic Management of Poultry in Rural Uganda*
  - Gram Vikas (a non-US organization): *Developing and testing an innovative behavior change program for safe child feces management in India*
  - Stanford University (a US organization): *Bringing it Home: Driving School-Based WASH Messaging into the Household Environment in India*
  - IDinsight (a US organization): *Testing Nudges to Increase Handwashing in Schools Among Pupils in the Philippines*

The nine grants issued by WASHPaLS are summarized in Table 2. In total, $1,215,087 were expended on the nine grants, from an original budget amount of $1,318,588. A brief description of each grant is provided in the following section.

TABLE 2. SUMMARY OF AWARDED GRANTS

GRANTEE ACTIVITY TITLE	ORIGINAL BUDGET	FINAL BUDGET	PERFOR-MANCE PERIOD	NOTES
Splash WASH-in Schools Hygiene Nudges in Ethiopia	$99,965	$59,979	January 2018 – April 2019	Closed early without results. After the results of baseline analysis raised concerns about the validity of study, as designed, WASHPaLS and the grantee mutually decided to descope further grant activities.
iDE Expanding Women's Role in Nepal's Sanitation Value Chain	$99,000	$99,000	December 2017 – May 2019	Extended at no additional cost, with redesign of research question and grant activities as a result of formative Human-Centered Design Deep Dive research.
icddr,b mHealth Messaging: an Innovative Approach to Promote Improved Caregiver and Child Hygiene Practices in Bangladesh	$296,439	$296,439	January 2018 – May 2020	Extended at no additional cost, due to COVID-19 related delays.
icddr,b Household Problem-Solving to Reduce Children's Exposure to Chicken Feces	$295,280	$324,276	November 2018 – May 2021	Extended with additional funding, due to COVID-19 related delays.

GRANTEE ACTIVITY TITLE	ORIGINAL BUDGET	FINAL BUDGET	PERFOR-MANCE PERIOD	NOTES
Stanford University Bringing it Home: Driving School-Based WASH Messaging into the Household Environment	$99,944	$19,989	July 2019 – July 2021	Closed without results, due to COVID-19 related delays and school shutdowns in India.
Gram Vikas Developing and testing an innovative behavior change program for safe child feces management (CFM) in Odisha, India	$128,086	$115,530	June 2019 – November 2021	Extended at no additional cost, due to COVID-19 related shutdowns delays. Ceiling was reduced to remove "conditional milestone" for unneeded travel and activity costs.
IDinsight Testing Nudges to Increase Handwashing in Schools Among Pupils in the Philippines	$99,918	$99,918	July 2019 – May 2020	Completed on schedule and budget.
The Water Trust Improving Hygienic Management of Poultry in Rural Uganda	$99,956	$99,956	July 2019 – September 2021	Extended at no additional cost, due to COVID-19 related delays.
EarthEnable Behavioral and Biological Plausibility of the Protective Effects of Improved Flooring	$100,000	$100,000	April 2020 – November 2020	Extended at no additional cost, due to COVID-19 related delays.

4.3 SUMMARY OF GRANTS ACTIVITIES

The nine grant activities are summarized below; links are provided to the final reports, manuscripts, and other communication products produced by the grantees. In addition, WASHPaLS disseminated products such as the behavior change communication materials developed by the grantees through established networks such as the USAID Globalwaters.org, the Communication Initiative, and the USAID Food Security Network Resource Library. Hygienic environments side sessions featuring the work of several grantees were presented at the UNC Water and Health Conference in 2019, 2020, and 2021.

Splash. A 16-month grant issued to Splash sought to test the introduction of subtle environmental nudges in school and household settings to influence the adoption of handwashing with soap by children and their families. Through a baseline exercise, Splash found that handwashing with soap (HWWS) prevalence among children was 37 percent, much higher than the assumption of 10 percent used for sample size determination. Splash also found that mirrors and water barrels with messaging on them, in high traffic areas of the home, had the strongest attraction and promise of changing behavior, and was able to infer that using schools as a point of distribution for nudges holds promise for reaching households, as participation and interest were high. In the end, though, the study was underpowered to document impact from the proposed interventions, and thus, was unable to answer the proposed study questions. The Final Report summarizes the study approach, baseline intervention, and findings.

iDE. The grant to iDE explored the role that women play in the sanitation value chain in Nepal and how those roles may impact key behaviors such as latrine purchase and use. The 13-month grant supported the Government of Nepal's drive toward national ODF status by reducing barriers to women's increased and sustained participation in sanitation value chains as well as increasing customers' purchase

and use of latrines. iDE found that households purchasing latrines from women use them more, perhaps because female sales agents placed more importance on follow-up visits. Female sales agents also took a more problem-led sales approach, situated in the local context, and highlighted potential social sanctions. On the other hand, male sales agents performed better when interacting with non-marginalized households, and households where men exclusively have the financing to make decisions. Men also leveraged connections with other households and community members to "close the sale." The final report summarizes the study approach, conclusions, and recommendations for organizations seeking to leverage local sanitation entrepreneurs.

icddr,b (mHealth). The 29-month grant sought to test the effectiveness of phone-based text and voice reminders (e.g., mHealth) in improving safe child feces disposal and food hygiene practices and reducing childhood mouthing of soil and other contaminated fomites. icddr,b found that mHealth alone is not sufficient to trigger or sustain changes in BabyWASH behaviors, and that interpersonal sessions and pictorial modules are needed to introduce and reinforce complex, new BabyWASH behaviors. Further, post-intervention, caregivers had relatively high knowledge of ideal BabyWASH behaviors but were limited in their ability to perform these behaviors due to household chores and women's restricted access to enabling technology (mobile phones). That said, icddr,b also found marked improvements in child feces management (CFM) and HWWS after managing children's feces after the intervention, as well as improvements in HWWS before food preparation and child feeding, and small improvements in safe food storage. The Final Report summarizes the study approach, results and recommendations for future research. A manuscript was published in the *American Journal of Tropical Medicine and Hygiene*.

icddr,b (poultry cooping). A second grant icddr,b conducted over 30 months, built upon icddr,b's existing knowledge of backyard poultry raisers practices, risks, and incentives to identify and enhance scalable and sustainable strategies that neighborhoods can adopt to separate children under five years of age from poultry and poultry feces. It drew on a neighborhood-based, participatory problem-solving approach to identify and improve upon existing behaviors and strategies to separate children and poultry; explore feasibility, acceptability, effectiveness, difficulties, benefits, and costs associated with candidate behaviors and strategies; and investigate the effectiveness of a behavior change intervention, with and without monetary support, to households to confine poultry in a shed in the courtyard at night. The intervention yielded many of desired behaviors and linked the "enabling technology" to improved practice. Intervention participants were more likely to have an improved nighttime poultry shed, confine all poultry outside at night, and have fewer poultry feces inside the household (but not have fewer in the household courtyard or compound). Households with an improved shed were more likely to confine all poultry outside at night, less likely to have poultry feces inside the house, and report more handwashing with soap after poultry-related activities. The Final Report summarizes the study approach and major conclusions and recommendations.

Stanford University. Under this grant Stanford sought to build on the collaboration with World Vision and Sesame Workshop's WASH UP! partnership to test the use of learning communications objects and associated instructional guidance to enhance the likelihood of information transmission between teacher, student, and household. WASH UP! includes a school-based curricular program developed by the Sesame Workshop that targets six- to nine-year-old primary school students with messaging about germ theory and healthy behaviors, such as handwashing and consistent latrine use. Unfortunately, grant implementation was disrupted due to the COVID-19 pandemic and was not completed.

Gram Vikas. A 30-month grant to Gram Vikas to research the behavioral factors influencing the adoption of safe CFM practices, and CFM hardware that reduces fecal exposure and is preferred by caregivers. The intervention focused on two CFM behaviors of interest: (1) safe disposal of child feces, and (2) child latrine training in households with children under five years of age. Gram Vikas found that

the combination of group and household focus on determinants of behavior, together with increased access to "enabling technologies," may be highly effective at changing CFM and latrine training behaviors. Child latrine use, and caregiver's safe disposal steadily increased over time, from 21 percent of children using a latrine before the program to 53 percent at the second household visit. Caregiver safe disposal also increased over time—from 16 percent before the program to 31 percent at the second visit. Consequently, these increases in safe CFM behaviors led to a large decline of unsafely managed feces, from 59 percent before the program to 13 percent at the second household visit. The findings are presented in the Final Endline Survey.

IDinsight. An 11-month grant to IDinsight aimed to test the impact of "nudges" on handwashing among students in the Philippines. The nudge intervention was designed to address the primary barriers to handwashing among children in the Philippines, which IDinsight's previous studies have found to be forgetfulness and more broadly, a lack of habit formation. The tested intervention consisted of the following nudges: painted footpaths with spray-painted footprints from toilet stall to handwashing station, calendars of handwashing posters, "watching eye" stickers above the handwashing station, and arrow stickers pointing to a soap dish. This low-cost intervention, averaging $78 per school, or $11 per handwashing area, proved both popular and effective. IDinsight found that nudging increased HWWS after toilet use by 17 percentage points in intervention schools, an increase of 148 percent. The Final Report presents the results of the evaluation, which are intended to inform scale-up recommendations for schools across the Philippines. A manuscript was published in the *American Journal of Tropical Medicine and Hygiene*.

The Water Trust. A 26-month grant to Water Trust aimed to help rural poultry owners with children to hygienically separate poultry from the children by focusing on a small set of key factors, including increased risk perception, increased perception of potential livelihood benefits, increased skills, and increased supportive social norms. To address barriers to behavior change in rural Uganda, the grant implemented a series of participatory training exercises designed to (1) increase awareness of health risks and lost livelihood benefits of current poultry management practices, (2) build practical skills for poultry management that address risks and improve livelihood benefits, and (3) build supportive community norms for investing in poultry management through facilitating savings group discussions on poultry management. Through an RCT and microbial hand rinse sample analysis, Water Trust found no impact of the training-only intervention on poultry management practices, contamination of children's hands, or reported child health. Additionally, Water Trust found households that took out a poultry loan were no more likely to have a poultry enclosure than those who chose not to take an interest-free poultry loan. Even households with dedicated spaces for poultry, including coops, houses, and baskets, still had high rates of observable poultry feces, likely connected to traditional poultry feeding practices that allow for free-roaming animals. An underlying challenge was that rural households are managing poultry at a scale that may be too small to justify investing in appropriate facilities. The recurring costs of food and immunization are considered high, as are perceived risks of disease or theft when cooped. The final report is available here and two webinars here.

EarthEnable. An eight-month grant to EarthEnable aimed to explore the behavioral and biological mechanisms by which improved indoor flooring could improve child and maternal health, as well as document motivations and barriers to installation of improved flooring and behavior changes associated with it, including exploratory mouthing by young children. The EarthEnable measured changes in exposure to soil and contamination by comparing quantities of dust on improved and unimproved floors. Through this grant, EarthEnable found that children who spend time on improved floors have substantially lower pathogen exposure than children who spend the same amount of time on unimproved floors. However, the limited time spent inside and lower mouthing frequencies inside than outside suggest that improving indoor floors alone may not be sufficient to dramatically reduce children's exposure to fecal contamination. Therefore, improved flooring should be combined with

interventions to reduce fecal contamination of the outside environment, such as animal feces management. The final report is available here.

4.4 GRANTS MANAGEMENT CHALLENGES

Though WASHPaLS took several actions to minimize risk and reduce the burden of managing grants remotely, the project still faced challenges in managing the GUC program.

Remote management of grants. As anticipated during the design phase, remote management of a global grants program was a significant challenge. WASHPaLS mitigated this challenge by selecting grantees with strong technical and administrative capacity and proven past performance; developing grant activities that were appropriate for long-distance oversight; issuing only Fixed Amount Awards, and carefully designing milestones to ensure payments were based on performance; and establishing clear communication protocols for ongoing monitoring and regular check-ins with grantees including monthly progress reporting.

Due to the determination to use only Fixed Amount Awards to minimize risk of remote management and ensure that grant payments were performance-based, WASHPaLS did not authorize subawards under grants. However, most grantees proposed advisory partnerships with academic institutions (primarily US-based universities), which led to some challenges during negotiation and implementation. To ensure grantees received the necessary technical support, WASHPaLS authorized grantees to hire individuals as academic research advisors under consultant agreements, rather than under subawards to their respective university (see Table 3).

Additionally, under several of the grants, WASHPaLS funding contributed to a larger initiative, and therefore branding and attribution of project funds in affiliation with the universities and grantees was often an area that required nuanced guidance and careful monitoring.

Despite careful selection of grantees for their technical capacity, as well as administrative and financial agility, many grants required more intensive technical guidance than anticipated or budgeted for. WASHPaLS found it necessary to provide intensive review of quantitative and qualitative analysis and reporting, including gender analysis and reporting; in some cases, even for grantees with external academic consultants.

TABLE 3. SUMMARY OF AWARDED GRANTS/ACADEMIC PARTNERS

GRANTEE ACTIVITY TITLE	ACADEMIC PARTNER	ACADEMIC ADVISOR(S)
Splash WASH-in Schools Hygiene Nudges in Ethiopia	Rollins School of Public Health Emory University	Matt Freeman, Ph.D.
iDE Expanding Women's Role in Nepal's Sanitation Value Chain	--	--
icddr,b mHealth Messaging: an Innovative Approach to Promote Improved Caregiver and Child Hygiene Practices in Bangladesh	Johns Hopkins Bloomberg School of Public Health	Christine Marie George, Ph.D.
icddr,b Household Problem-Solving to Reduce Children's Exposure to Chicken Feces	Johns Hopkins Bloomberg School of Public Health Stanford/University of California - Berkely School of Public Health	Elizabeth Thomas, MSPH (Ph.D. Candidate) Laura (Layla) Kwong, Ph.D.

GRANTEE ACTIVITY TITLE	ACADEMIC PARTNER	ACADEMIC ADVISOR(S)
Stanford University Bringing it Home: Driving School-Based WASH Messaging into the Household Environment	(Stanford Poop Group Stanford School of Medicine)	Jenna Davis, Ph.D. Gary Darmstadt, M.D., M.S.
Gram Vikas Developing and testing an innovative behavior change program for safe CFM in Odisha, India	Rollins School of Public Health Emory University	Gloria Driessnack Sclar, MPH (PhD Candidate)
IDinsight Testing Nudges to Increase Handwashing in Schools Among Pupils in the Philippines	--	--
The Water Trust Improving Hygienic Management of Poultry in Rural Uganda	North Carolina State University, Dept. of Civil Engineering, Global WASH Cluster	Angela Harris, Ph.D. Ayse Ercumen, Ph.D. Jeremy Lowe, B.S (Ph.D. Candidate)
EarthEnable Behavioral and Biological Plausibility of the Protective Effects of Improved Flooring	Stanford/ University of California - Berkely School of Public Health	Laura (Layla) Kwong, Ph.D.

COVID-19. In the spring of 2020, WASHPaLS grantees began experiencing varying degrees of challenges and delays in implementation due to the onset of the COVID-19 pandemic, in response to which governments began to impose restrictions on international and domestic travel and public gatherings.

In particular, grant activities in Bangladesh (icddr,b – poultry), India (Gram Vikas and Stanford), and Uganda (The Water Trust and EarthEnable) experienced significant delays due to the spikes in COVID-19 cases in Years 4 and 5, which resulted in extended lockdowns and curfews, school closures, and indefinite pauses to grant activities. WASHPaLS coordinated closely with the grantees and USAID to provide flexibility for grantees to adjust grant activities as needed to respond to these unanticipated and rapidly shifting contexts, including extending grant periods of performance, modifying activity designs and implementation plans, and increasing or decreasing grant budgets. During the shutdowns and periods of delay, grantees continued to provide monthly reporting and contingency planning.

The Stanford grant to explore behavior change innovations supporting handwashing in Indian schools suffered extensive delays due to school closures in India. In April 2021, WASHPaLS and Stanford reached agreement that it was not be possible to complete the activities originally planned, and a modification of the research and grant scope also was not feasible within the limited time remaining for the WASHPaLS contract. WASHPaLS formally modified the grant to a reduced scope, and unfortunately, closed out the grant without results.

Regulatory limitations. Per ADS 302.3.4.13, US organizations were limited to a ceiling of $100,000 per grant. Following the competitive process, six of the nine awards were made to US organizations (Splash, iDE, Stanford, IDinsight, The Water Trust, and EarthEnable). This limitation impacted the technical scope and approach that could be undertaken by US grantees within this ceiling, whereas non-US grantees (icddr,b and Gram Vikas) were not subject to such limitations, and WASHPaLS was able to make larger grant awards. Additionally, WASHPaLS had limited flexibility to issue costed modifications to the US grantees to address challenges posed by COVID-19 delays. In July 2021, USAID increased the threshold to $250,000 per grant to a US organization, which will provide additional flexibility for future grants program.

4.5 RECOMMENDATIONS

Overall, the policies and risk management procedures put into place under WASHPaLS facilitated the technical and administrative management of the small grants program. These procedures include the two-tiered application process, a review and evaluation committee composed of subject-matter experts in the solicitation theme, issuance of only performance-based Fixed Amount Awards, use of Google forms for M&E reporting, and the requirement for brief monthly progress reports to ensure ongoing communications and monitoring between milestones.

For future management of a similar research-based, remote grants program, WASHPaLS recommends that the following be considered: (1) require grantees to identify and budget for a quantitative and/or qualitative methods expert to support their particular design and analysis; and (2) identify a point person(s) on the project team to provide qualitative and quantitative technical support to the grantee, with allocated budget for this support (or alternatively with budget and staff level of effort flexibility to provide needed assistance).

5.0 PARTNERSHIPS, COLLABORATION, AND COMMUNICATION

Partnerships and active engagement with local systems, international networks, and other USAID projects were essential for USAID and WASHPaLS to maximize its contributions and learning within the WASH sector. Over the course of the project, WASHPaLS partnered with several types of organizations, depending on the purpose and intent of the partnership, including academic institutions (see Box 1), NGOs, donors, foundations, and implementing organizations. This section reviews partnership efforts, including the important role of the WASHPaLS Advisory Board, and the project's communication initiatives.

WASHPaLS was a research and learning project (also referred to as an RIU project) that generated knowledge outputs (i.e., produce evidence) in partnership with other projects, organizations, and individuals, and through these partnerships promoted the dissemination and use of the evidence generated to maximize its utility and influence on policy and practice at local, national, and global levels. Partnerships were, therefore, a vital element of WASHPaLS. Partnerships were used to confirm the relevance of the research agenda, co-generate knowledge and learning through collaborative and coordinated implementation, disseminate findings, distribute resources, or other conduct related activities that furthered the project's objectives. WASHPaLS partners co-implemented research activities, contributed data, facilitated access to programs (including through administrative and logistical support), provided insights to analysis and current thinking, and supported the dissemination of research findings within their organizations and to broader audiences in their networks.

BOX 1: WASHPaLS ACADEMIC PARTNERS

Through its various workstreams and assignments, WASHPaLS engaged 11 US-based universities…

1. Colorado School of Public Health
2. Columbia University
3. University of California – Berkeley
4. University of California – Davis
5. Stanford University
6. Emory University
7. Georgia Tech
8. John Hopkins University
9. North Carolina State University
10. University of North Carolina – Chapel Hill
11. Washington University – Brown School

…and nine universities based outside of the US.

1. Cranfield University (UK)
2. Kenyatta University (Kenya)
3. Sokoine University of Agriculture (Tanzania)
4. University of Nairobi (Kenya)
5. Yale-NUS College (National University of Singapore)
6. Bangladesh Agricultural University
7. Chittagong Veterinary and Animal Sciences University (Bangladesh)
8. Makerere University (Uganda)
9. University of Dhaka (Bangladesh

5.1 TYPES OF PARTNERSHIPS

As noted, partnerships were critical to the success of WASHPaLS. Partners supported and collaborated on the project's implementation research, helped share and disseminate learning, and contributed meaningfully to the research themes and designs. While many partnerships were focused on a specific activity or in a specific country (see, for example, Box 2 that summarizes WASHPaLS' collaboration with the USAID/Ethiopia Transform WASH activity), the partnerships and collaboration with some spanned the life of project and included collaboration on several of WASHPaLS research activities. Selected examples are provided below.

UNICEF. UNICEF was among WASHPaLS' most consistent and supportive collaborators/partners, both at the headquarters and at the country level in several countries, particularly on CLTS and MBS activities. As noted elsewhere in the report, WASHPaLS engaged closely with UNICEF Ghana on the subsidy study, and together developed three briefs and a short documentary film about the targeted

BOX 2: PARTNERING IN ETHIOPIA

WASHPaLS collaborated with Transform WASH in Ethiopia on an impact assessment of proposed tax exemptions on plastic products. The partnership intentionally positioned Transform WASH as the facilitation and advocacy lead supported by WASHPaLS as the technical specialist contributing novel approaches (e.g., DST) and global knowledge. Transform WASH facilitated WASHPaLS engagement with GOE officials, UNICEF, other development partners, and the local private sector through individual meetings and workshops. With guidance and support from USAID/Ethiopia, Transform WASH and WASHPaLS developed a stakeholder engagement plan, socialized the assessment findings among cross-sector stakeholders, and responded to requests for additional information to broaden advocacy efforts and influence government decision making.

Additionally, Transform WASH leveraged WASHPaLS resources to support MBS training and long-term capacity building of the GOE. An initial outcome of this effort is the Ministry of Health's *National Market-based Sanitation Training Manual for Ethiopia*, as well as the *Sanitation Subsidy Protocol* and the updated *National MBS Guidelines* that incorporate the MBS framework, definition, and key concepts from the WASHPaLS MBS desk review.

subsidy study, protocols, and findings to support UNICEF's advocacy with government counterparts. WASHPaLS also engaged closely with UNICEF Kenya as a part of the Kenya Rural Sanitation Research buy-in activity as UNICEF Kenya was working on revisions to rural sanitation policy with the Government of Kenya.

On several occasions over the life of the project, UNICEF requested WASHPaLS to provide peer review feedback on UNICEF knowledge products, including, for example, on three chapters from the UNICEF Guidance on MBS (Optimizing market interactions, Expanding access to business finance, and Market Enablers). WASHPaLS also provided input on the drivers of hand hygiene to the UNICEF/World Health Organization document: *State of the World's Hand Hygiene Report*, based on material shared at the GHP Innovation Think Tank session on Handwashing Habits.

Global Handwashing Partnership and the Clean, Fed, and Nurtured (CFN) Coalition. WASHPaLS participated in the GHP Steering Committee, as well as the CFN Coalition Steering Committee. WASHPaLS also supported the GHP through participation in the Handwashing Innovations Think Tank Steering Committee. WASHPaLS and CFN and/or the GHP co-convened sessions at sector conferences including at the UNC Water and Health Conference. CFN joined with the USAID/PRO-WASH initiative to plan and deliver a four-part "thematic discussion" series on Improving Hygienic Environments for Infants and Young Children.

WaterAid. WaterAid collaborated with WASHPaLS on the MBS work in Nigeria and on development of the SanPlan Tool, interacting with WaterAid throughout to test beta versions of the tool. WaterAid teams in the UK, Niger, and Cambodia provided feedback on the tool concept, early versions of the tool, and the mechanisms for determining the community classifications. WaterAid also provided mWater survey data from their community classification activities in Niger and Rwanda, which were used to evaluate the accuracy of the SanPlan rural typology layers.

5.2 ASSESSING WASHPaLS PARTNERSHIP AND ENGAGEMENT EFFORTS

The WASHPaLS Engagement Strategy highlighted the importance of partnerships, focused and targeted engagement, and proper dissemination to maximize the likelihood that WASHPaLS' work would be used. The following principles underpinned the WASHPaLS engagement process:

- Engagement was targeted to improve utilization of WASHPaLS findings and results.
- Research protocols, small grants, and technical assistance needed to be responsive to and embedded within local systems as appropriate.

- The timing and process for engagement with local stakeholders was refined as the work progressed, but was initiated as early as possible within each activity and sustained throughout the life of the Activity.
- WASHPaLS was committed to developing country-specific and/or theme-specific (i.e., CLTS, MBS, safe play spaces) engagement plans.
- To facilitate a gender-sensitive and socially inclusive approach, WASHPaLS engaged traditionally excluded persons and/or organizations that represent them as stakeholders in the project's work, and considered the differential circumstances, needs, and opportunities for men, women, boys and girls, and vulnerable groups in the design, research, recommendations, and dissemination.

To gauge its effectiveness at fostering RIU, particularly through a partnership modality, WASHPaLS engaged in a series of reflective exercises about six months prior to the end of the project that included semi-structured interviews with key partners and users of WASHPaLS research findings. Interviewees included WASHPaLS Advisory Board members, staff from partner organizations, and national-level partners. Below is an overview of their perceptions of WASHPaLS as a project, followed by a summary of the key findings and recommendations emerging from these discussions for designing RIU activities and on partnering approaches to make RIU more effective.

WASHPaLS' effectiveness as an RIU project. Though delivered through a USAID contract mechanism, WASHPaLS was seen as having developed and delivered independent "robust and rigorous" research with a clear focus on influencing current thinking in the sector. Both formal and informal feedback from WASHPaLS seminars and webinars confirmed these perceptions of the value of WASHPaLS' contribution from a wider audience.

Interviewees appreciated the diverse set of partners that formed the WASHPaLS consortium, each bringing different approaches and perspectives to research—from the more academic, to a more consultant-driven, to a more NGO action learning approach. This broad range of partners also brought WASHPaLS a wide network of contacts. The WASHPaLS team was recognized as being approachable and responsive to requests and queries, with members "playing to their strengths" by bringing expertise and experience to the different tasks and interactions.

However, few interviewees had a sense of the full scope of the project and how the various pieces in the portfolio fit together. Stakeholders typically engaged with WASHPaLS around a particular theme or activity. It is likely that WASHPaLS' internal partners did not feel sufficiently well versed or positioned to discuss the work of other WASHPaLS research themes. While consortium members were largely allowed to conduct their own research, more cross-consortium touchpoints may have led to cross-fertilization of approaches, contacts, and validation efforts. With that said, WASHPaLS work was seen to have advanced the discussions in all key WASH-related thematic areas addressed by the project. To some, the goal for a project like WASHPaLS is to experiment and plant seeds for others to build on rather than to define and develop definitive thinking on particular topics.

While WASHPaLS' achievements are substantial across several thematic areas, the timeframes may have been insufficient and pressures from partner commitments on WASHPaLS' staff time may have limited the depth of the research and its detailed reflections on implications for implementation.

Framing the findings. WASHPaLS was designed as an RIU project aimed at influencing the investment and programmatic decisions of a wide range of sector stakeholders from global to local levels. Thus, the messaging from different research streams needed to be sophisticated enough to attract and interest thought leaders, but nuanced and prescriptive enough for practitioners to know what to do with the information. This posed a challenge for WASHPaLS with different approaches put forth by different consortium partners, each requiring "translation" into workable guidance by implementing agencies. Recommendations from stakeholder interviews were threefold.

First, as a research project, WASHPaLS should do more than stick to generalities; WASHPaLS findings needed to go a step beyond. As one interviewee noted, "if [WASHPaLS findings are] vague and noncontroversial, then they are not practical anymore…" Nonetheless, users of WASHPaLS research confirmed the value of WASHPaLS' contributions. Second, RIU projects like WASHPaLS should frame findings clearly around key questions with which implementers are grappling (like where to invest, how best to engage a particular stakeholder group like local government, what has worked elsewhere, and which elements can be adapted in which contexts). Learning briefs would then be written specifically around these questions. Finally, interviewees noted that RIU findings should be straightforward (though not simplistic). Guidance should state key findings and "three things that you need to do or think about to apply these findings."

Source of Information. Related to framing the above findings, interviewees highlighted the concept of "know your customer." The key recommendation to WASHPaLS-type RIU projects was to be intentional with early engagement and obtain multiple perspectives. It is easy to get stuck in the research and steeped in detail without sufficiently bringing partners along. Interviewees spoke of two target groups: (1) users who will apply the emerging guidance in their programming; and (2) owners (e.g., academic institutions, global learning hubs and partnerships) who will provide a home for the learning, tools, and frameworks for further experimentation, refinement, and wider dissemination.

For users, WASHPaLS needed to understand what specific information and guidance they needed and when. This also means understanding how external partners process information, how it filters through the organization, what the relationship is between headquarters and field offices (i.e., level of autonomy of country/field-level staff), what is doable in their context, and other related issues. This means frequent reality checks to make sure that the research is meeting their needs. For owners, areas to clarify include understanding the resources potential owners have to advance work; how integral learning, tools, and frameworks are to their strategy; what existing material in the owner's portfolio might compete with new material; and what communications tools are accessible.

Channels to being heard. Several interviewees provided feedback on how best to rise above the "noise" of sector deliberations so the WASHPaLS message is heard. Referring in part to the use of advisory groups, several interviewees noted the benefits of "getting ideas to thought leaders or influencers in the sector" who can help to expand reach. These are "people [operating more at the global level] who already have deep connections to and trust from those doing the work." To reach them, RIU projects need to understand where they obtain their information. Some will look for peer-reviewed journal articles and recommended reading from trusted sources; others receive information by word of mouth and triangulate emerging ideas from colleagues and counterparts.

Projects like WASHPaLS try to bridge this spectrum, sending messages through formal and informal channels. This requires a deliberate strategy for each piece of work—when to use which approach (to publishing, outreach, and engagement) and for what influence. Timelines may be a key factor, so effort is necessary to understand when stakeholders need information. While journal articles are a key output of research projects like WASHPaLS and provide legitimacy and validation for findings, significant time can pass from drafting to publication with limitations on what can be shared before the article goes to print. Thus, one must consider if this is the most effective way to disseminate messages.

Other observations revolved around the desk reviews published early on by WASHPaLS. These were seen as making a solid contribution to the sector and as a strategy worth repeating, particularly as they provide an opportunity to reference and position stakeholders that RIU projects seek to engage. A key challenge noted by respondents related to the lag between initial desk review outputs and subsequent publications. Intermittent briefing notes and other material need to be produced to keep target audiences engaged in WASHPaLS' activities.

Interviewees also recommended testimonials from field teams as a key mechanism for disseminating messages to implementation partners. "It helps when field teams hear from other field teams—something like 'this is what WASHPaLS has done, and this is what we did with those research findings …'" This could be a strategy to use in webinars whereby WASHPaLS researchers allow practitioners to tell the story of how research came about, how it was designed, and how it was used. Several noted that, often, though research was interesting, it was not necessarily "plug and play;" work was needed to translate the findings to ensure emerging guidance was accessible and in the right language. Having practitioners share stories directly would help with the translation process and offer clues on where gaps remain in understanding and analysis.

The guidance was provided in the interest of seeing RIU projects like WASHPaLS be as responsive as possible. This means finding the most effective ways to frame and define the research and findings, understanding how target audiences process information, and finding ways to have WASHPaLS' voice heard. Each element relies on more deliberative and strategic use of partnerships and engagement that identifies and brings on the right people and organizations from initial stages of the project.

5.3 COMMUNICATION AND DISSEMINATION

The WASHPaLS approach to communications and dissemination was somewhat ad hoc. The project did not have a communication strategy per se. Nonetheless, WASHPaLS had an active presence in sector events, maintained an expansive and diverse network of partner organizations and individuals with whom the project interacted, and utilized multiple platforms to disseminate research findings and share lessons learned. WASHPaLS established a microsite on the USAID GlobalWaters.org website that served as the main repository of project-generated materials. Over the life of project, WASHPaLS worked closely with the Communications and Knowledge Management (CKM) project and CKM II on the design of the microsite as well as on ensuring that the site was updated and resources were easily found. The project produced research reports, briefs, manuscripts, and blogs; delivered presentations at WASH sector events; and hosted webinars, workshops, and learning events, both in-person and increasingly virtual with the onset of COVID-19.

5.3.1 PARTICIPATION AND PRESENTATIONS AT SECTOR EVENTS

WASHPaLS maintained a presence and participated at both international conferences, such as the UNC Water and Health Conference, and country and/or regional sessions that presented more targeted opportunities to share research findings and engage with local stakeholders. These were important opportunities for disseminating findings, ensuring that the research themes continued to be relevant, making connections for partnering and for uptake of WASHPaLS' findings, and in general for keeping the project in the sector's thoughts.

Over the years, though WASHPaLS participated in numerous international fora (e.g., Stockholm World Water Week, Water Engineering and Development Centre conferences, International Water and Sanitation Centre WASH conferences), the UNC Water and Health Conference proved to be among the most valuable platforms for WASHPaLS to interact with sector stakeholders. The conference attracts a diverse audience from within and outside the sector, including practitioners, academics, and donors/funders, providing many opportunities to share the research and engage others formally and informally. Participation at UNC raised the profile of the project and provided an effective means to disseminate research findings to, as well as jointly convene sessions with, the important and influential organizations in the sector. Participation at UNC provided an opportunity to have critical conversations that informed the design of upcoming work led by others. Additionally, WASHPaLS learned about or was invited to join new opportunities to collaborate with USAID and other partners. Typically, WASHPaLS hosted several side sessions, convened in partnership with other organizations, and made several technical and poster presentations.

WASHPaLS team members also participated in and contributed to more targeted events that presented opportunities to share findings and discuss results with subject matter experts, including for example, Columbia University's Period Posse Webinar Series and their Massive Open Online Course on Global Menstruation, GHP Innovation Think Tank, the Society for Benefit Cost Analysis conference, and the Hygienic Environments Thematic Discussion Series co-convened with the USAID PRO-WASH project.

International gatherings presented certain opportunities, but it was engagement at the country or local levels that provided the best opportunities for uptake of implementation research lessons and findings. Presentations and discussions with local stakeholders through locally sponsored events (such as WASH Sector Working Groups) or WASHPaLS-convened workshops were instrumental to having local audiences understand the work and how the findings could be applied in their context.

5.3.2 END OF PROJECT DISSEMINATION STRATEGY

WASHPaLS initially intended to host an end-of-project in-person event to share and disseminate findings to invited WASH sector stakeholders. However, the lingering effects of the COVID pandemic and restrictions on travel and in-person gatherings prevented the project from doing so. Instead, WASHPaLS developed an End-of-Project Strategic Communications and Dissemination Plan to maximize the reach and penetration of the messages WASHPaLS wanted to leave with the sector. Activities were centered around a WASHPaLS' "eBook" that presented the topline take-aways from WASHPaLS' research in an easily navigable and highly visual format (a dynamic PowerPoint presentation). The eBook highlighted key takeaways that reflected the major learnings from the research that would be of most relevance and use to the sector.

The Strategic Communications and Dissemination Plan had two main elements: (1) an active outreach component in which project staff contacted key sector influencers directly to discuss the take-aways through (mostly) one-on-one conversations, and (2) a five-week social media campaign through which the project pushed out key messages on Twitter, LinkedIn, and Facebook.

The **Active Outreach** activities sought to transmit key findings directly to identified actors. One-on-one engagements were arranged with key influencers to walk through findings, gauge reactions, and address questions. WASHPaLS aimed to highlight clear, unambiguous results, extract policy-relevant, actionable elements, recognize which results are more nuanced (and communicate them strategically), and formulate the outreach as conversations, in the spirit of securing buy-in as well as soliciting feedback.

From October 2021 to February 2022, WASHPaLS reached out via email to 24 bilateral and multilateral implementers, foundations, and implementing organizations to offer special "briefings" on WASHPaLS' topline findings. The project included in the invitations the eBook, summarizing those findings, as well as links to project resources on GlobalWaters.org. Sixteen of the twenty-four active outreach targets accepted the offer, and included, for example, UNICEF, the World Bank, Bill and Melinda Gates Foundation, Stone Family Foundation, CARE, Global Communities, and WaterAid, among others.

The level of effort and commitment required for this active strategy (as compared to a single global webinar or series of webinars) was not trivial, a function not only of the number of hours of actual presentation, but also the logistical lift of contacting key targets and scheduling times for the calls. However, there was no doubt that the strategy had important advantages over the more traditional webinar/workshop route. The level of engagement and interaction with findings that typified these briefings simply would not have been possible in a webinar setting, nor could the team be assured of attendance by key individuals who were not purposively targeted to receive the briefing. These active outreach targets each gave WASHPaLS their undivided attention for 60-90 minutes, asking probing questions and requesting more detail as well as offering their own reactions to the conclusions.

These interactions also laid the foundation for potential future interactions with these individuals and their organizations that may well turn into expanded partnerships in the future. Of particular note was outreach to implementing organizations; the staff extended invitations to the WASH leadership of these organizations (such as CARE, WorldVision, Save the Children, and Global Communities), and their response was to request "internal webinars" for their extended WASH teams, in the range of 15-30 participants (including many calling in from field locations).

These targeted briefings strengthen the partnership potential of the project because they place WASHPaLS' work front-and-center in the minds of the outreach targets as well as initiating a discussion and exploration of potential collaborative opportunities in ways that cannot be achieved through global webinars (or even via sessions at well-attended meetings like the UNC Water and Health and Stockholm World Water Week conferences). Those targeted were grateful for having been offered the opportunity for these "private screenings," which might predispose them toward partnerships in the future.

Social Media Campaign. To further support the dissemination of research findings, WASHPaLS also conducted a social media campaign from January 17, 2022, to February 23, 2022. The campaign promoted key pieces of research and findings to a broad cross-section of audiences, with the aim of encouraging audience engagement with the products. Social media posts were published three times a week over a period of five weeks (17 posts in total). Each post contained explainer text, a graphic or image, a link to relevant research product or resource, and tags to consortium partners, to expand the reach and dissemination of project products. Posts were published across Tetra Tech's international development (@TetraTechIntDev) Facebook, Twitter, and LinkedIn platforms. The campaign was conducted in partnership with project consortium partners and USAID CKM to leverage their broader networks and online audiences.

WASHPaLS analyzed each social media post for its performance using standard social media metrics such as Post Clicks, Reach, Likes. However, in light of the campaign's objective to disseminate research products and findings and promote engagement with materials, the social media campaign performed moderately at best. While engagement rate measures the clicks on documents, it provides no measure of how the user interacts with the documents they click on. For example, if someone saw a baseline report promoted on LinkedIn that was of interest and they clicked on it, there is no insight into their user behavior beyond the single click. It begs questions like did they understand the data they found? How did they use it? While social media campaigns do a good job of getting links out to online audiences, they are limited in their ability to reach target audiences and to maintain prominence before the message is lost in the social media shuffle as social media users' feeds are constantly refreshed. Further, social media did not allow for a human conversation or dialogue, which is critical to the effective distribution and uptake of research.

Looking ahead, research projects like WASHPaLS should devote more time to hosting webinars, arranging targeted outreach meetings, and presenting data at events where the experts can speak to the target audience. Whether it is a WASH institution or an individual WASH practitioner, the value of dialogue far exceeds that of posting a link into the airwaves. Social media can be useful to draw attention to specific events and publications (i.e., when pushing out information); direct engagement and interacting with target audiences is a more productive way of getting at uptake and use of research findings.

5.4 ADVISORY BOARD

The seven-member WASHPaLS Advisory Board was an important element of the project, providing technical feedback on proposed project activities and findings and serving as a vital conduit to key national and international sector stakeholders. Board members were selected because their strategic reach into the WASH sector as well as their sector/thematic knowledge. As a group the Advisory Board

contributed experience and expertise in research, technical assistance at multiple levels, policy work, advocacy, and direct implementation. This well-rounded experience base helped to ground the project's research activities and help ensure that the research was timely and of relevance to the sector. It helped position WASHPaLS' work in a wider policy, implementation, and funding context.

Table 4 provides a list of the sector experts that served on the Advisory Board over the life of the project. There was some turnover in membership in the first two years of the project, but five of the seven original members served for the life of the project. This stability allowed the project to deepen relationships with Board members as individuals and as a cohort and allowed them to develop an institutional memory of activities that facilitated discussions in later years.

Board members were consulted as a group through periodic virtual and in-person meetings but also were consulted on an individual basis for informal consultations as their interests, technical and country experience, and networks aligned with the various research activities. They were kept abreast of project activities through periodic emails and individual communications with WASHPaLS team members. Nonetheless, in some instances, the project missed opportunities to engage with Board members early in the research design process, or in the review of initial research findings; inputs at these critical moments would have added value and possibly contributed to a more streamlined and efficient process.

TABLE 4. ADVISORY BOARD MEMBERS

BOARD MEMBER	AFFILIATION (AT TIME OF SERVING)	DATES SERVED
Clarissa Brocklehurst	Independent	October 2016 – February 2022
Martin Gambrill	World Bank	October 2016 – November 2017
Michael Gnilo	UNICEF	October 2016 – February 2022
Antoinette Kome	SNV	November 2017 – February 2022
Craig Kullmann	World Bank	November 2017 – September 2018
Eddy Perez	Global Communities	October 2016 – February 2022
Jan Willem Rosenboom	Bill and Melinda Gates Foundation	October 2016 – February 2022
Darren Saywell	Plan International	October 2016 – November 2017
Susanna Smets	World Bank	September 2018 – February 2022
Carolien Van der Voorden	Water Supply and Sanitation Collaborative Council	October 2016 – February 2022

6.0 GENDER EQUALITY AND SOCIAL INCLUSION

From the outset, WASHPaLS was committed to advancing GESI through all activities. A GESI Specialist from the Iris Group led on GESI work and supported other members of the core project team, partners, and grantees to achieve project goals and ensure all activities were aware of and responsive to GESI issues. The objectives of the WASHPaLS' GESI work were to:

- Improve the project's outcomes and promote GESI as a development goal by conducting ongoing gender analysis and integration for all project activities.
- Generate better products and services for WASH-related behavior change by integrating gender across mutually reinforcing research and grant activities.
- Contribute to the body of knowledge on gender and WASH by developing, documenting, and disseminating best practices on gender integration in the project's technical areas and research processes, and by drawing lessons from across research streams and grants to generate high-level learning.

To consider GESI more systematically and thoroughly in interventions, WASHPaLS developed a project-wide gender integration plan (GIP) to ensure that, to the extent reasonable, implementation research interventions and other project activities deliberately integrated gender, were socially inclusive, and considered end users. The GIP offered guidelines and a process to allow WASHPaLS to:

- Accelerate gendered or inclusion opportunities and identify and define strategies to overcome gendered barriers or other barriers to inclusion;
- Safeguard against unintended consequences and gender-exploitative strategies, furthering social exclusion and other negative impacts; and
- Ensure benefits/outcomes of project activities reach women, girls, and other marginalized or regularly excluded populations.

The main goal of this integration plan was to ensure that the planned research took GESI into account appropriately by addressing issues such as those noted in Box 3. Particularly for core research streams and grants, the GIP ensured that development assumptions and hypotheses of change integrated GESI considerations and prioritized the meaningful participation of women/girls and other marginalized/excluded populations in the activities.

BOX 3: GENDER INTEGRATION IN RESEARCH PROCESS

Example: Consider how the gender of the interviewer may influence data quality or bias responses in household surveys with more restrictive gender norms.

- Will a female family member open the door to a male interviewer?
- If she does open the door, might it have negative consequences for her with her husband or male family members later?
- If she opens the door and responds to the interview questions, will she be as truthful in her answers (especially to sensitive questions) as she would be with a woman interviewer?

The GIP also addressed the integration of GESI perspectives in monitoring, evaluation, and learning. The GIP identified opportunities to measure GESI outcomes (e.g., time use, roles/responsibilities, mobility, safety, decision making, etc.) within WASHPaLS' activities and included a GESI focus on performance indicators (e.g., sex disaggregation when counting people).

Through the GIP and with the support of the GESI Specialist, WASHPaLS integrated GESI considerations successfully across the four project components as reflected in Table 5.

TABLE 5. GENDER INTEGRATION IN WASHPALS

COMPONENT	GENDER INTEGRATION
Crosscutting	• Delivered training and refresher seminars and presentations to the WASHPaLS team, reviewing gender terms, outlined USAID's policy priorities for gender and women's empowerment, and gave brief overview of gender analysis and integration. • Participated in the project's internal research committee to provide input on research questions, design, protocols, instruments, analysis, and M&E plans. • Contributed to finalization of the M&E plan to ensure GESI considerations. • Conducted technical reviews to ensure all engagement plans, project deliverables, and dissemination strategies were gender-integrated and socially inclusive. • Provided input to literature reviews as needed (e.g., identified key words for search engines, relevant articles, journals, other sources)
Component 1	• Provided STTA to missions as requested, for gender assessments, gender integration input on project or research design, strategies, protocols and instruments, and other strategy, research, technical assistance, and capacity-building services as required. • Reviewed evaluation tools for GESI-sensitivity, particularly for qualitative tools. Ensure that surveys also collect socio-demographic data on households and household heads. • Supported analysis of age-, sex-, socio-economic status-disaggregated data. • Reviewed draft reports and provide feedback on GESI considerations.
Component 2	• Using the individual research stream's Gender Analysis and Integration Matrix (GAIM) as a guide, provided input on inception reports, research questions, designs, protocols, survey instruments, analysis, development of recommendations, measurement, M&E plans, and solicitation of vendors. • Documented best practices related to GESI. • Participated in selected scoping and or/research implementation trips, as requested.
Component 3	• Provided input on selection/evaluation criteria and Request for Applications language for all grants. • Participated in grant review process and provided feedback to grantees on their proposals, work plans, M&E plans, and interim technical deliverables. • Supported all grantees to conduct their gender analysis deliverable in the GAIM format to integrate GESI and address potential for unintended consequences. • Documented best practices and lessons learned to build the evidence base of learning and promising practices on gender and hygiene behavior change.
Component 4	• Promoted GESI work and contributions to body of knowledge on GESI and WASH across international bodies and platforms. • Participated/provided input into coalitions/communities of practice and sought opportunities to present project results and learning at international WASH conferences/events.

High-level takeaways that emerged from GESI considerations over the life of the project include the following (in addition to the take-aways from the more GESI oriented buy-in work including MHM in the workplace, and Mozambique gender and hygiene behavior formative research):

- ***Research design and partnership selection matter for equity and inclusion.*** Research and learning partnerships should engage a diverse group of stakeholders. Partnership selection influences research design, which influences research outputs, which in turn influence future policy and programming. By selecting a partner that understands GESI issues and/or represents groups that are often excluded, resulting research is more inclusive and representative. Partnerships should be planned from the outset for respectful, non-extractive engagement and be led by experts from the geographic areas that research findings will target.

Thoughtful research design also can result in positive GESI outcomes. If you do not ask the question, you do not get the answer. If you do not ask the question the right way, you do not get helpful answers. When selecting research methods, there are tradeoffs that can impact whether research successfully represents certain vulnerable groups and elevates their voices. Specific research methods, such as participatory methods, may more effectively engage and amplify the voices of marginalized and hard-to-reach stakeholders, and they may generate the best data for exploratory or more nuanced GESI topics. For example, the hygienic environments research considered the gendered roles and responsibilities around caregiving and protecting family health. It was deliberately designed to detect any negative or positive consequences of introducing a playpen. As a result, the research was able to demonstrate GESI outcomes, such as a reduced burden for women, with potential for positive mental health effects as well. The grants program also offered an opportunity for innovation on GESI research through a specific GESI-focused request for applications, as well as GESI technical support for non-GESI focused grants. Because of their intentional focus on either GESI topics and or GESI-integrated research and measurement strategies, the grants were able to make important contributions to the body of knowledge on GESI and WASH.

- ***Better understanding gender dynamics between sellers and buyers can improve success of WASH solutions.*** There is an untapped role for female entrepreneurs in MBS solutions, particularly in selling to other women. Results from the GESI-focused grant showed that female sales agents can play a key role in selling to other women, especially in marginalized or vulnerable households. They can also be more successful at accompanying sales with social and behavior change messages. Future MBS programs should explore the potential of female sales agents in selling to other women, especially in female-headed households.

- ***There are unanswered questions about gender dynamics in vulnerability targeting and subsidy distribution.*** While it is something that was not investigated as part of the vulnerability targeting in the WASHPaLS subsidy study in Ghana, future research initiatives should consider more explicitly the role gender plays in different types of vulnerability targeting and how it affects inclusion or exclusion errors. Additionally, future research should examine the gender dynamics of subsidy distribution—to whom and in what form subsidies are distributed—to maximize overall benefits, WASH outcomes, and Do No Harm principles.

- ***Understanding the "black box" of the household may offer additional programming leverage points in MBS and behavior change for WASH.*** As was the case for several WASHPaLS studies, WASH programs often use the household as the unit of analysis, and as a result, pay less attention to dynamics within the household around who makes relevant decisions and controls the allocation of resources. Future research should seek to understand how and who makes WASH-related expenditure decisions in the household and how programming can leverage these by segmenting the market or understanding upstream drivers of WASH behaviors. For example, who controls the resources and make the decisions on WASH purchases? What implications might this have for MBS marketing and social and behavior change messaging?

- ***Innovative WASH solutions should consider and leverage gender dynamics in communities.*** Better understanding gender dynamics, particularly on decision making at the household (see previous point) and community levels, may offer important programmatic leverage points. At the community level, as sanitation approaches evolve, it is critical to consider the effects of gender-blind approaches from CLTS (which may compound gendered and other vulnerabilities), and how future sanitation programs can avoid these pitfalls and be gender transformative, such as through dedicated gender-intentional approaches in community-led and area-wide sanitation.

7.0 MONITORING, EVALUATION, AND LEARNING

As noted previously, capturing and measuring achievements of RIU projects like WASHPaLS is very challenging; even defining what "achievement" is can be challenging (i.e., what constitutes uptake, and what is use?). The indicators used for WASHPaLS were a combination of output and outcome indicators, complemented by several management or process indicators, yet challenges remain.

- Attribution of outcomes is difficult. Research findings may influence processes and decisions, but it is often difficult to attribute results directly to research findings and recommendations.
- It is difficult to know where or how research findings are disseminated, shared, or used, there are challenges to gathering data to support outcome indicators; most is by chance or if staff are alerted to the information (e.g., Ethiopia MBS uptake).
- A project like this does not utilize standard indicators (expect for manuscripts) that are designed more for bilateral implementation activities.
- The indicators utilized for WASHPaLS do not readily lend themselves to be used for project-wide adaptive management.

MEL management. The WASHPaLS Deputy Project Manager reviewed weekly activity updates, solicited reporting of specific results from the activity leads via Google Forms, and validated and archived the results. Results submitted via Google Forms were processed using linked Google Sheets, which enabled automatic updating of the results summary tables and tables of results disaggregated by topic area, country, etc., as specified in the M&E Plan.

In Year 5, WASHPaLS conducted an internal data quality assessment of the project's MEL system, focusing on five of the 10 performance indicators (Component 1, Component 2, 2.1, 2.2, and 4.1; see Table 6). The data quality assessment provided several findings and recommendations regarding the validity, integrity, precision, reliability, and timeliness of the WASHPaLS data and management systems for indicator tracking. Importantly, given that Component 1 and Component 2 were outcome-level indicators, it was noted that the project needed to do more to better understand these outcomes and their broader implications. As a result of this observation and to better understand the project's overall reach and impact, the WASHPaLS Strategic Partners Advisor conducted a series of KIIs and focus group discussions with key project stakeholders that had utilized project findings in their work and organizations. (These findings are summarized above in Section 5.)

Review of performance and management indicators. Table 6 presents WASHPaLS achievements on the performance indicators against life-of-project targets, as per the revised M&E Plan approved May 2020, and Table 7 summarizes WASHPaLS achievements on the project's management indicators. As indicated in Table 6, WASHPaLS met or exceeded its life-of-project targets for 9 of the 10 indicators, in some cases by a significant margin.

TABLE 6. PERFORMANCE INDICATORS RESULTS AND TARGETS

N°	PERFORMANCE INDICATOR	ANNUAL RESULTS BY YEAR (Y)						LIFE OF PROJECT (LOP) TOTAL	LOP TARGET
		Y1	Y2	Y3	Y4	Y5	Y6		
C1	Number of USAID Missions and operating units, implementing partners, local governments and donors applying WASHPaLS approaches/tools (Custom) [OUTCOME]	0	0	13	7	2	0	22	11
C2	Number of reports, policies, laws, agreements, action plans, regulations, strategies, or investment agreements (public or private) influenced by WASHPaLS (Custom) [OUTCOME]	0	1	15	6	6	0	28	6
C3	Number of people exposed to WASH approaches/tools through WASHPaLS events, communications materials, and products (Custom) [OUTCOME]	217	4544	4631	10,438	4,666*	214 (Q1Y6)	24,710	5,000
C5	Number of workshops/events at which research methods, preliminary results and findings are presented (Custom) [OUTPUT]	3	15	26	32	43	7	126	30
1.1	Number of technical assistance assignments and technical reports produced by WASHPaLS team (Custom) [OUTPUT]	0	3	4	4	13	0	24	20
1.2	Level of Mission satisfaction with the responsiveness and quality of WASHPaLS Technical Assistance (Custom) [OUTPUT]	N/A	0	8	8	9.25	9.37	8.6	8.5
2.1	Number of local partners actively participating in research activities designed and implemented by WASHPaLS (Custom) [OUTPUT]	0	11	11	2	15	7	46	28
2.2	Number of peer-reviewed scientific publications resulting from US Government support to research and implementation programs (STIR-12) [OUTPUT]	0	0	1	1	6	2	10[4]	4
3.1	Number of grants awarded to behavior change innovators (Custom) [OUTPUT]	0	3	5	1	0	0	9	9
4.1	Number of partnerships established or supported (Custom) [OUTPUT]	4	2	1	2	0	0	9	10

*Total includes the total annual exposure numbers from online views and downloads

[4] This does not include publications produced under Component 3 (Grants).

TABLE 7. MANAGEMENT INDICATORS RESULTS AND TARGETS

N°	Management Indicator	Y1	Y2	Y3	Y4	Y5	Y6	Total
M1	Number of people trained through WASHPaLS Activities	0	25	155	1,729	286	0	2,195
M2	Number of USAID Missions supported by WASHPaLS	0	2	2	2	3	0	9
M3	Number of grant applications received in response to public solicitations	334	11	49	0	0	0	394
M4	Number of communications materials developed to share information and learning	11	32	27	48	39	7	164
M5	Number of formal consultations with Advisory Board	24	12	7	8	2	3	56

8.0 PROJECT ADMINISTRATION

8.1 PROJECT MANAGEMENT AND OPERATIONS

Staffing

Project management benefitted from adaptive management over the course of the WASHPaLS contract, particularly when it came to staffing and operational needs.

The project began with three full-time staff: the Project Director, Deputy Project Director, and Operations and Finance Manager. These three positions were sufficient to initiate the project and to advance well into the core research. The team envisioned that an Operations Specialist would be brought on part time in Year 2, however project needs dictated the position be full time instead. As the number and complexity of Component 1 buy-ins increased significantly in Year 4, a Subcontracts Manager was hired full-time to help manage the increased workload. Roles and responsibilities were redistributed among the team, allowing team members to play to their strengths in supporting the project. This fuller cohort of operational staff was needed to manage the impact of the COVID-19 pandemic on implementation.

In addition to operational adjustments, WASHPaLS hired a Strategic Partnership Advisor as a long-term consultant to provide strategic partnership, communication, and dissemination advice to the project team. This Advisor provided critical insights that informed activities in the last year of the project.

Planning

Throughout the course of the project, WASHPaLS maintained a productive and collaborative working relationship with the USAID technical leads through biweekly project meetings to discuss overall progress, as well as through periodic technical meetings that permitted a deeper discussion of Component 2 and 3 activities. In addition to these biweekly meetings, WASHPaLS hosted semi-annual work planning meetings, with USAID and full partner and Research Advisor participation. These meetings were held in-person prior to the COVID-19 pandemic, switching to virtual when travel restrictions limited in-person participation. As the full WASHPaLS team was widely dispersed geographically, these regular gatherings were an important time to engage in valuable face-to-face, in-depth technical discussions. A major outcome of these meetings was general agreement on the overarching direction of the year's activities.

Subcontract Administration

As research stream leads, subcontractors implemented a significant portion of the project; they conducted field-based research and assumed leadership in development of research protocols.

Midway through Year 2, the USAID Task Order Contracting Officer agreed that a full consent to subcontract package would not be necessary for any of the Water and Development Indefinite Delivery Indefinite Quantity Contract (WADI) subcontractors taking part in a Component 1 buy-in. An abbreviated consent package would suffice. This adaptation helped the project prepare and submit technical response packages for Component 1 buy-in requests much faster than would have otherwise been possible, facilitating the design and start-up of these activities.

8.2 FINANCIAL MANAGEMENT

Overall spending on the WASHPaLS project reached $23,048,228 over the 5.5-year life of project (see Table 8). WASHPaLS received a no-cost extension in Quarter 1, Year 5, allowing additional time to implement key activities and share end-of-project learning and results. As some activities continued into

the extension period (i.e., Year 6), expenditures in Year 5 were less than planned for in the Year 5 Work Plan, though at $6.8M were still the highest of any project year.

TABLE 8. PROJECT EXPENDITURES BY YEAR

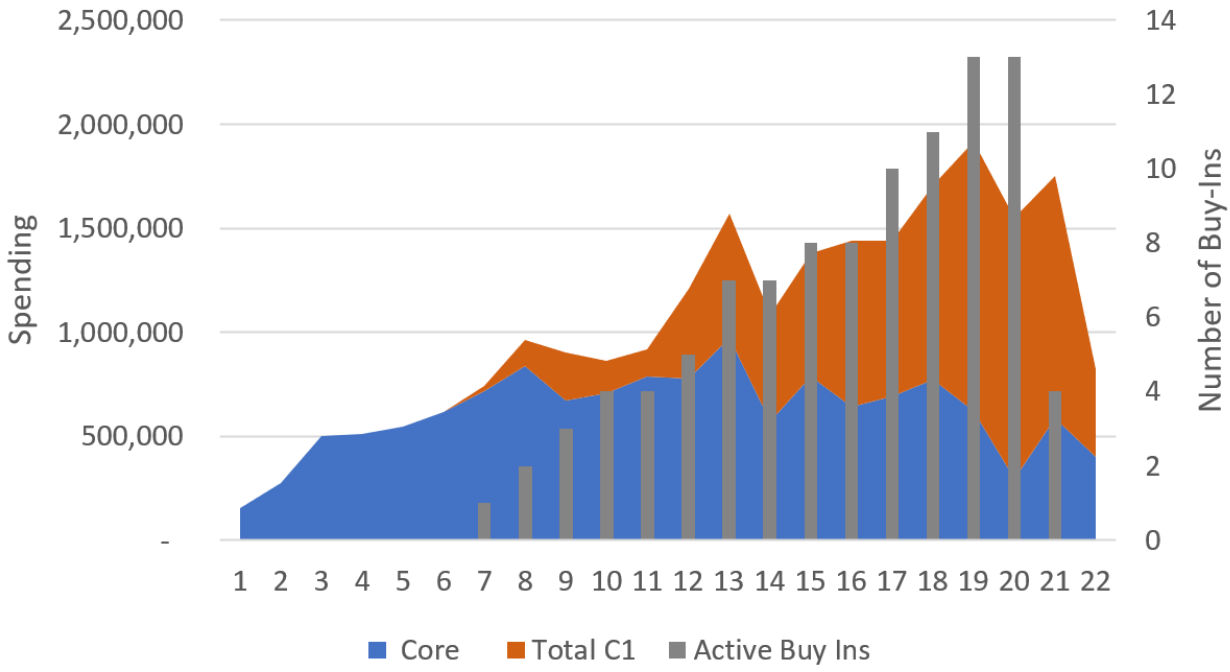
Category	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Core	1,381,656	2,536,389	2,683,490	2,622,343	2,274,990	894,933	12,393,802
Component 1: Technical Assistance	-	151,680	944,603	2,509,200	4,231,146	1,589,636	9,426,264
Component 3: Grants Under Contract	-	160,204	334,317	343,741	298,103	91,797	1,228,162
Totals	**1,381,656**	**2,848,273**	**3,962,410**	**5,475,284**	**6,804,239**	**2,576,366**	**23,048,228**

Late in Year 5, WASHPaLS identified significant cost savings that had accumulated across the budget, in part because of shifts in implementation due to the COVID-19 pandemic, and to realized cost savings on several activities. It became clear that the project would likely not expend to the full budget ceiling, or perhaps even the core funds obligated to date. In consultation with the TOCOR, WASHPaLS identified strategic opportunities to utilize remaining funds by expanding ongoing activities and directing additional funds to the COVID-19 Longitudinal Data Collection and MHM buy-in activities.

Figure 6 illustrates core and Component 1 spending over the life of project, showing how, while core spending remained relatively stable over the life of project, Component 1 spending began accelerating in Q7 as the number of buy-ins increased (Figure 6 also overlays the number of active buy-ins against project expenditures over the life of project). This accelerated activity and spending on Component 1 buy-ins in the second half of the project required a shift in resource utilization from support to core-funded activities to Component 1. The sharp drop in the final quarters of the project reflect the fact that implementation was ongoing until the final quarter, not an ideal situation for ensuring smooth close-out, but was necessitated by the pandemic-induced delays and the desire to complete rather than cancel tasks.

The impact of the COVID-19 pandemic on the project's financial management was felt across all components and line items, with the net effect being a decrease in overall project spending. Examples of reduced spending can be found in lower than anticipated travel costs, both international and domestic, as in-person meetings and events were shifted online. Two performance evaluations—those for Kenya RAPID and Madagascar RANO WASH—were conducted without the benefit of Team Leader travel, for example. Multiple gatherings and events were also shifted to be online, including the global dissemination event for the MHM in the Workplace Action Research activity and the Senegal Sanitation Market and Sagal Brand Assessment workshop. Maintaining accurate financial projections in the midst of uncertainty created by the pandemic was a challenge for the project through the final two years of implementation, but despite this challenge, the WASHPaLS Year 6 Contractor Performance Assessment Report noted,"[The project] has demonstrated conscientious attention to cost throughout the project, with all project expenses being necessary and well-justified."

Figure 6. Comparison of Project Expenditures between Core and Buy-Ins, by Quarter



APPENDIX 1: SUMMARY OF PROJECT DELIVERABLES AND REPORTS

DELIVERABLE	DATE APPROVED	NOTE/DEC LINK/GLOBALWATERS LINK
Contractual Deliverables		
Community-Led Total Sanitation (CLTS)		
Establishment of the advisory board (memorandum of understanding or other documentation)	1/19/2017	Satisfied by Terms of Reference.
Report on analysis of national level CLTS implementation	4/13/2018	https://www.globalwaters.org/resources/assets/washpals/examination-cltss-contributions-toward-universal-sanitation
Plan for field-based research on CLTS - Performance Envelope Inception Report	7/31/2018	Inception report not published, but key details included in Study Report
Plan for field-based research on CLTS - Subsidy Study Inception Report	1/18/2019	Inception report not published, but key details included in Study Report
Synthesis Report on Performance Envelope (PE) Study	1/26/2022	https://dec.usaid.gov/dec/content/Detail.aspx?vID=47&ctID=ODVhZjk4NWQtM2YyMi00YjRmLTkxNjktZTcxMjM2NDBmY2Uy&rID=NTk3NDc1
Final Subsidy Study Report	1/26/2022	https://dec.usaid.gov/dec/content/Detail.aspx?vID=47&ctID=ODVhZjk4NWQtM2YyMi00YjRmLTkxNjktZTcxMjM2NDBmY2Uy&rID=NTk3ODM4
National workshops and/or events presenting findings in three focus countries		Fulfilled by: (1) PE Quant results: Kenya Sanitation Conference, 10/30/2019 (2) PE Quant results: Africa Water Association in Uganda, 2/5/2020 (3) PE results presentation to partners in Cambodia (7/11/19), Zambia (8/30/19) and Ghana (1/19/20) (4) Subsidy Study: Mole XXXI Conference, 11/5/2020 (5) United Nations Children's Fund (UNICEF) Ghana Rural Sanitation Model and Strategy Review Workshop, 6/11/21
One paper submitted to peer-reviewed journal	11/27/2018	"Policy Diffusion in the Rural Sanitation Sector: Lessons from Community-Led Total Sanitation (CLTS)" Published in World Development Journal 8/5/19
Presentation of CLTS research results from desk-based and field-based research at one global forum		University of North Carolina (UNC) Water and Health Conference 2019
Market Based Sanitation (MBS)		
Presentation of findings to one key global forum		UNC Water and Health Conference 2020
Report on desk-based analysis of sanitation marketing	5/14/2018	https://www.globalwaters.org/resources/assets/washpals/rural-mbs-desk-review
Plan for field-based research on sanitation marketing	3/27/2018	Inception report not published, but key details included in Study Report
Report synthesizing findings of implementation research on sanitation marketing	1/27/2021	Enterprise Viability and Sustainability Guidance Report & Case Studies

DELIVERABLE	DATE APPROVED	NOTE/DEC LINK/GLOBALWATERS LINK
		https://www.globalwaters.org/resources/assets/washpals/creating-viable-and-sustainable-sanitation-enterprises-guidance-practitioners
Report synthesizing findings of implementation research on sanitation marketing	7/14/2021	Decision Support Tool (DST) Technical Paper – also called "DST WHITE PAPER" https://www.globalwaters.org/sites/default/files/washpals_mbs_dst_technical_paper_revised.pdf
National workshops/events presenting findings from sanitation marketing implementation research in three focus countries		Fulfilled by: (1) Global webinars, (2) MBS trainings, and (3) Outbriefs with implementation partners for three study countries.
Submission of one paper to a peer-reviewed journal describing results of Task 2.2.1 and Task 2.2.2	3/11/2019	"Global Assessment of Grant-Funded, Market-based Sanitation Development Projects" Published in Waterlines 9/15/20
Hygienic Environments		
Report detailing design of the implementation research study methodology	9/14/2018	Inception report not published, but key details included in Study Report
Study report and slide presentation summarizing research findings of the clean play spaces for young children study	11/24/2020	https://www.globalwaters.org/resources/assets/washpals/exploring-use-playpens-feasible-option-protecting-infants-exposure-animals-feces
Event sharing knowledge on the outcomes of the clean play spaces for young children study		https://www.fsnnetwork.org/event/wash-nutrition-and-child-growth-webinar-series-implementing-partners
Technical brief giving practical advice on how to incorporate knowledge of clean play space interventions in United States Agency for International Development (USAID) programming	2/18/2022	https://dec.usaid.gov/dec/content/Detail.aspx?vID=47&ctID=ODVhZjk4NWQtM2YyMi00YjRmLTkxNjktZTcxMjM2NDBmY2Uy&rID=NTk3NDg0
One paper on clean play space study submitted to peer-reviewed journal	5/4/2020	"Exploring the Use and Appeal of Playpens to Protect Infants from Exposure to Animals, Animal Feces, and Dirt in Rural Ethiopia" Published in American Journal of Tropical Medicine and Hygiene 11/2/20
Grants		
Final grantee reports with findings on behavior change innovations synthesized into a single report with introduction		Fulfilled by the Grants section in this Final Report and Final Hygienic Environments: https://www.globalwaters.org/resources/assets/toward-hygienic-environment-infants-and-young-children-limiting-early-exposures
Slide presentation summarizing behavior change innovation results and peer review		Following UNC Presentation meets this deliverable: "Improving Hygienic Environments for Infants and Young Children (Revisiting one year later)" 10/7/2021.
Presentation of behavior change innovation results at an international water, sanitation, and hygiene		UNC presentations fulfill deliverable: (1) "What the Cluck!? Improving Hygienic Environments for Infants and Young Children" 10/29/2017;

DELIVERABLE	DATE APPROVED	NOTE/DEC LINK/GLOBALWATERS LINK
(WASH) or health technical conference		(2) "Exploring the Determinants and Indicators of Poultry Feces Management Behaviors in Rural Western Uganda" 10/27/2020;
Annual standalone report summarizing partnership activities, results, and achievements (Year [Y]1)	11/22/2017	Confirmed with Task Order Contracting Officer's Representative on 9/6/17 that the Annual Report fulfills this requirement
Consultative meetings convened between USAID and strategic partnership organization staff, for each partnership twice during the life of the project to discuss progress and plan future collaboration	9/30/2021	Confirmed in Year 6 work plan that this is fulfilled by Partnership activities captured under indicator 4.1: (1) Global Handwashing Partnerships; (2) Clean Fed and Nurtured Coalition; (3) BabyWASH Coalition; (4) UNICEF, (5) Sanitation and Water for All; (6) CLTS Knowledge Hub; (7) World Bank; (8) Practices, Research, and Operations (PRO)-WASH; and (9) WaterAid.
General Management		
Annual Work Plans (Y1-Y6)	2/6/2017 11/3/2017 10/3/2018 11/4/2019 9/22/2020 9/30/2021	Draft submitted by September 1; final approved following resubmittal incorporating USAID feedback
Quarterly Reports (Including Financial Reports) (Quarter [Q]1–3, for Y1–5; Q1 for Y6)		Submitted within 10 days of end of reporting Quarter; final approved following resubmittal incorporating USAID feedback; as per Task Order, Q4 report was incorporated into the FY Annual Report
Annual Report (Y1) (including Foreign Assistance Reporting)	11/22/2017	https://dec.usaid.gov/dec/content/Detail.aspx?vID=47&ctID=ODVhZjk4NWQtM2YyMi00YjRmLTkxNjktZTcxMjM2NDBmY2Uy&rID=NjA0NTAw
Annual Report (Y2) (including Foreign Assistance Reporting)	12/6/2018	https://dec.usaid.gov/dec/content/Detail.aspx?vID=47&ctID=ODVhZjk4NWQtM2YyMi00YjRmLTkxNjktZTcxMjM2NDBmY2Uy&rID=NTE0OTUw
Annual Report (Y3) (including Foreign Assistance Reporting)	1/10/2020	https://dec.usaid.gov/dec/content/Detail.aspx?vID=47&ctID=ODVhZjk4NWQtM2YyMi00YjRmLTkxNjktZTcxMjM2NDBmY2Uy&rID=NTU2ODI5
Annual Report (Y4) (including Foreign Assistance Reporting)	12/2/2020	https://dec.usaid.gov/dec/content/Detail.aspx?vID=47&ctID=ODVhZjk4NWQtM2YyMi00YjRmLTkxNjktZTcxMjM2NDBmY2Uy&rID=NTU2ODI5
Annual Report (Y5) (including Foreign Assistance Reporting)	2/15/2022	https://dec.usaid.gov/dec/content/Detail.aspx?vID=47&ctID=ODVhZjk4NWQtM2YyMi00YjRmLTkxNjktZTcxMjM2NDBmY2Uy&rID=NjAzNDQ5
Final Report		This report
Foreign Assistance Reporting (Gender- disaggregated data will be gathered and reported on the desired outcomes of the activity where applicable)		On a semi-annual basis as part of the mid-year quarterly and annual report - see separate entries for relevant quarterly and annual reports
Monitoring and Evaluation Plan	2/14/2017	Contractual deliverable; approved by USAID.
Quality Assurance/Quality Control Plan	3/1/2017	Contractual deliverable; approved by USAID.
Component 1 Deliverables		
Cambodia Integrated Nutrition, Hygiene, and Sanitation Activity (NOURISH) Impact Evaluation		

DELIVERABLE	DATE APPROVED	NOTE/DEC LINK/GLOBALWATERS LINK
Final Evaluation Report	6/3/2020	https://www.globalwaters.org/resources/assets/impact-evaluation-cambodia-integrated-nutrition-hygiene-and-sanitation-project
Kenya Resilient Arid Lands Partnership for Integrated Development (RAPID) Impact Evaluation		
Baseline Report	3/25/2019	https://pdf.usaid.gov/pdf_docs/PA00TM7M.pdf
Midline Report	5/11/2020	https://pdf.usaid.gov/pdf_docs/PA00WM44.pdf
Final Evaluation Report	7/27/2021	https://dec.usaid.gov/dec/content/Detail_Presto.aspx?vID=47&ctID=ODVhZjk4NWQtM2YyMi00YjRmLTkxNjktZTcxMjM2NDBmY2Uy&rID=NTg5ODQ3
Overview and Key Findings	9/21/2021	https://www.globalwaters.org/sites/default/files/kenya_rapid_ie_brief_08252021.pdf
Summary of Findings and Recommendations	9/22/2021	https://www.globalwaters.org/sites/default/files/kenya_rapid_ie_summary_08262021.pdf
Kenya Integrated Water Sanitation and Hygiene Activity (KIWASH) Mid-Term Evaluation		
Final Evaluation Report	3/25/2020	https://www.globalwaters.org/resources/assets/mid-term-evaluation-kenya-integrated-water-sanitation-and-hygiene-kiwash-project
Summary Brief	3/25/2020	https://www.globalwaters.org/resources/assets/washpals/kenya-integrated-water-sanitation-and-hygiene-kiwash-project-mid-term-evaluation
Summary Report	3/25/2020	https://www.globalwaters.org/resources/assets/mid-term-evaluation-kenya-integrated-water-sanitation-and-hygiene-kiwash-project-0
Menstrual Health Management (MHM)		
Desk Review and Economic Impact Report	2/18/2020	https://www.globalwaters.org/resources/assets/washpals/menstrual-hygiene-management-and-womens-economic-empowerment-review-existing
Final Activity Report Out and Slide Deck	2/1/2022	https://www.globalwaters.org/sites/default/files/global_eop_webinar_complete_slide_deck_1-18-2022.pdf
Workplace Intervention Materials	1/28/2022	https://www.globalwaters.org/resources/assets/menstruation-workplace-edutainment-videos
Final report of the metrics research	1/6/2022	https://www.globalwaters.org/resources/assets/advancement-metrics-menstrual-hygiene-management-workplace-final-report
Guide to workplace MHM indicators	1/27/2022	https://www.globalwaters.org/sites/default/files/indicator_guide_2-18-2022.pdf
Dissemination event – Global	1/19/2022	https://www.globalwaters.org/events/washpals-menstrual-hygiene-workplace-global-results-dissemination-webinar
Learning Brief – Overall	1/12/2022	https://www.globalwaters.org/resources/assets/menstrual-hygiene-management-workplace-learning-brief
Learning Brief – Kenya	1/12/2022	https://www.globalwaters.org/resources/assets/menstrual-hygiene-management-workplace-learnings-kenya
Learning Brief – Nepal	1/14/2022	https://www.globalwaters.org/resources/assets/menstrual-hygiene-management-workplace-learnings-nepal
Learning Brief – Cost Benefit Analysis	1/31/2022	https://www.globalwaters.org/resources/assets/cost-benefit-analysis-menstrual-hygiene-management-workplace
Learning Brief – Male Engagement	1/27/2022	https://www.globalwaters.org/resources/assets/engaging-men-improve-menstrual-hygiene-management-workplace
Final Report	2/1/2022	Advancement Of Metrics For Menstrual Hygiene Management In The Workplace Final Report | Globalwaters.org
Ghana Water for Health Performance Evaluation		
Final Evaluation Report	2/23/2020	https://www.globalwaters.org/resources/assets/washpals/performance-evaluation-ghana-wash-health-activity
15-page Report Summary	2/23/2020	https://www.globalwaters.org/resources/assets/washpals/performance-evaluation-ghana-wash-health-w4h-activity-summary-findings-and

DELIVERABLE	DATE APPROVED	NOTE/DEC LINK/GLOBALWATERS LINK
2-page Report Summary	2/23/2020	https://www.globalwaters.org/resources/assets/washpals/water-sanitation-and-hygiene-health-w4h-activity-performance-evaluation-overview
Mozambique Formative Research		
Activity Report – English	9/28/2021	https://www.globalwaters.org/resources/assets/formative-research-gender-and-hygiene-mozambique-final-report
Activity Report – Portuguese	9/28/2021	https://www.globalwaters.org/sites/default/files/washpals_moz_gender_hygiene_final_report_-_port_092021_508.pdf
Ethiopia Decision Support Tool		Deliverables from this buy-in were not posted publicly.
Kenya RAPID Performance Evaluation		
Final Evaluation Report	11/17/2020	https://www.globalwaters.org/sites/default/files/rapid_pe_-_summary_-_final_1.pdf
Summary Brief	11/17/2020	https://www.globalwaters.org/resources/assets/washpals/brief-end-term-performance-evaluation-kenya-resilient-arid-lands-partnership
Summary Report	11/17/2020	https://www.globalwaters.org/resources/assets/washpals/summary-end-term-performance-evaluation-kenya-resilient-arid-lands-partnership
COVID Trends and Futures Analysis		
Deep Dive – Democratic Republic of the Congo (DRC)	3/17/2021	https://www.globalwaters.org/resources/assets/washpals/assessing-effects-covid-19-access-water-sanitation-and-hygiene-usaid-high-priority-drc
Deep Dive – Mozambique	2/23/2021	https://www.globalwaters.org/resources/assets/washpals/assessing-effects-covid-19-access-water-sanitation-and-hygiene-usaid-high-priority-moz
Deep Dive – Nepal	2/3/2021	https://www.globalwaters.org/resources/assets/washpals/assessing-effects-covid-19-access-water-sanitation-and-hygiene-usaid-high-priority-nepal
Deep Dive – Rwanda	2/3/2021	https://www.globalwaters.org/resources/assets/washpals/assessing-effects-covid-19-access-water-sanitation-and-hygiene-usaid-high-priority-rwanda
Deep Dive – Senegal	2/3/2021	https://www.globalwaters.org/resources/assets/washpals/assessing-effects-covid-19-access-water-sanitation-and-hygiene-usaid-high-priority-senegal
Deep Dive – Ghana	2/3/2021	https://www.globalwaters.org/resources/assets/washpals/assessing-effects-covid-19-access-water-sanitation-and-hygiene-usaid-high-priority-ghana
Deep Dive – Kenya	2/3/2021	https://www.globalwaters.org/resources/assets/washpals/assessing-effects-covid-19-access-water-sanitation-and-hygiene-usaid-high-priority-kenya
Synthesis Report	1/11/2021	https://www.globalwaters.org/resources/assets/washpals/assessing-effects-covid-19-access-water-sanitation-and-hygiene-usaid-high-priority
Focus on Small Piped Providers in Ghana	3/10/2021	https://www.globalwaters.org/resources/assets/washpals/assessing-effects-covid-19-access-water-sanitation-and-hygiene-usaid-high-priority-ghaNA-followon
Rural Sanitation in Kenya - Pastoralist		
Final Research Report	10/28/2021	https://www.globalwaters.org/resources/assets/approaches-sanitation-access-pastoralist-areas-within-arid-and-semi-arid-lands
Research Brief	10/26/2021	https://www.globalwaters.org/sites/default/files/kenya_asal_research_brief_nov2021_final.pdf
Rural Sanitation in Kenya – Market Based Sanitation		

DELIVERABLE	DATE APPROVED	NOTE/DEC LINK/GLOBALWATERS LINK
Market Assessment Report, including executive summary and 2-page summary	1/18/2022	https://www.globalwaters.org/sites/default/files/kenya_sma_report.pdf
Ethiopia Growth through Nutrition Assessment		Deliverables from this buy-in were not posted publicly.
Liberia MBS		
Presentation following Data Analysis	2/3/2021	https://www.globalwaters.org/sites/default/files/usaid_liberia_sma_research_compendium.pdf
Market Assessment Report	11/26/2021	https://www.globalwaters.org/sites/default/files/usaid_liberia_sanitation_market_assessment_findings_final_report_december_2021_accessibility.pdf
COVID-19 Longitudinal		
Final Findings Note	1/14/2022	WASH and COVID-19 Longitudinal Data Collection Final Findings | Globalwaters.org
Madagascar Rural Access to New Opportunities (RANO) WASH Performance Evaluation		
Final Evaluation Report – English	11/16/2021	rano_wash_evaluation_final_report_w_annexes_oct2021_accessibility_adobe.pdf (globalwaters.org)
Final Evaluation Report – French	11/16/2021	Evaluation a mi-parcours de la performance de l'activite de "Rural Access to New Opportunities in Water, Sanitation, and Hygiene" (RANO WASH) Madagascar (globalwaters.org)
4-page Summary – English	12/6/2021	rano_wash_evaluation_report_summary_final.pdf (globalwaters.org)
4-page Summary – French	12/6/2021	rano_wash_evaluation_resume_finale.pdf (globalwaters.org)
1-page Abstract – English	12/6/2021	summary_one-pager_final.pdf (globalwaters.org)
1-page Abstract – French	12/6/2021	air_summary_one-pager_final_fr_proofed.pdf (globalwaters.org)
Senegal MBS		
Final Landscape and Market Assessment Report - English	2/2/2022	Research and Learning for Sanitation in Senegal - Final Report EN (globalwaters.org)
Final Landscape and Market Assessment Report - French	2/2/2022	Research and Learning for Sanitation in Senegal - Final Report FR (globalwaters.org)
2-page Summary – English	2/2/2022	PowerPoint Presentation (globalwaters.org)
2-page Summary – French	2/2/2022	Recherche et apprentissage pour l'assainissement au Sénégal - Résumé (globalwaters.org)

APPENDIX 2: SUBMITTALS TO THE DEVELOPMENT DATA LIBRARY

ACTIVITY	DATA ASSET	DATASETS	ACCESS LEVEL
Lao Subsidy Study	Impact Assessment of WASH output-based aid program in Southern Laos, 2018-19	Endline Household Survey	Restricted Public
Community-led total sanitation (CLTS) Subsidy Study	Subsidy study in Northern Ghana, 2019-Baseline household survey	(1) Baseline household survey (2) Endline household survey	Restricted Public
SPS	Ethiopia Safe Play Spaces Research, 2019	(1) Ethiopia Safe Play Spaces Research, 2019 Dataset	Restricted Public
Market-based sanitation (MBS)	Enterprise Viability and Sustainability Research, 2018-2020	(1) India (2) Nigeria (3) Cambodia	Restricted Public
CLTS Performance Envelope	CLTS monitoring and evaluation (M&E) and associated data for rural programs in Cambodia, Ghana, Liberia, and Zambia	(1) CLTS M&E and associated data for Zambia, 2013-2018 (2) CLTS M&E and associated data for Cambodia, 2012-2018 (3) CLTS M&E and associated data for Liberia, 2015-2018 (4) CLTS M&E and associated data for Ghana, 2014-2019	Public
CLTS Performance Envelope	CLTS qualitative data for rural programs in Cambodia and Ghana	(1) CLTS qualitative data for Cambodia, 2018-2019 (2) CLTS qualitative data for Ghana, 2018-2019	Public
International Development Enterprises (iDE) Grant	WASH Sanitation Marketing Survey Exploring Impacts of Sales Agent Gender in Nepal, 2019	(1) Household survey	Restricted Public
Splash Grant	WASH-in Schools Hygiene Nudges in Ethiopia 2018	(1) Household observations dataset (2) Student observations dataset	Restricted Public
IDinsight Grant	Testing Nudges to Increase Handwashing in Schools Among Pupils in the Philippines, 2019	(1) Randomized controlled trial (RCT) student observational data (2) RCT facility observational data	Restricted Public
International Center for Diarrhoeal Disease Research (icddr,b) Grant (2)	Household Problem-Solving to Reduce Children's Exposure to Chicken Feces, 2019-2020	(1) Trials of Improved Practices household dataset	Public
icddr,b Grant (1)	mHealth Messaging: an Innovative Approach to Promote Improved Caregiver and Child Hygiene Practices in Bangladesh, 2018-2019	(1) Interviews and focus group discussion (FGD) quantitative data; (2) RCT data from pilot study (3) Key performance indicators (used for statistical analysis)	Public

ACTIVITY	DATA ASSET	DATASETS	ACCESS LEVEL
Water Trust Grant	Improving Hygienic Management of Poultry in rural Uganda, 2019-2020	(1) Baseline household survey (2) Endline household survey (3) Environmental samples	Public
Gram Vikas Grant	Developing and Testing an Innovative BC program for safe child feces management in India, 2019-2020	(1) Formative research interviews and FGD quantitative data (2) Child feces management hardware survey (3) Baseline survey (4) Endline survey (5) Quantitative surveys measuring intervention fidelity (by other Gram Vikas team than implementation team) (6) Endline Data	Public
EarthEnable Grant	Behavioral and Biological Plausibility of Protective Effects of Improved Flooring, 2020-2021	(1) Observations of children under 5 (2) Observations of pregnant women (3) E. coli floor samples	Public
Cambodia Integrated Nutrition, Hygiene, and Sanitation Activity (NOURISH)	NOURISH Impact Evaluation (IE), 2018-2020	(1) Household survey (2) Anthropometry survey (3) Stool sample analysis	Restricted Public
Resilient Arid Lands Partnership for Integrated Development (RAPID) IE	RAPID IE, 2018-2021	(1) Round I Dataset asset survey, key informant interviews (KIIs) & FGDs (2) Round II sensor downloads and limited asset survey (3) Round III sensor downloads, limited asset survey, KIIs & FGDs	Public
Kenya Integrated Water Sanitation and Hygiene Activity (KIWASH)	KIWASH Performance Evaluation 2018	(1) Interview and FGD quantitative data	Restricted Public
Menstrual Health Management (MHM)	WASHPaLS MHM Workplace Action Research in Kenya, Shona EPZ 2021	(1) Women's Baseline (2) Women's Endline (3) Men's Baseline (4) Men's Endline	Restricted Public
MHM	WASHPaLS MHM Workplace Action Research in Kenya, Thika Cloth Mills 2021	(1) Women's Baseline (2) Women's Endline (3) Men's Baseline (4) Men's Endline	Restricted Public
MHM	WASHPaLS MHM Workplace Action Research in Nepal, Shangrila Carpets 2021	(1) Women's Baseline (2) Women's Endline	Restricted Public
MHM	WASHPaLS MHM Workplace Action Research Metrics Analysis, 2021	(1) Metrics survey data	Public
MHM	WASHPaLS MHM Workplace Action Research In Nepal, Milha Custom Rugs 2021	(1) Women's Baseline (2) Women's Endline	Restricted Public

ACTIVITY	DATA ASSET	DATASETS	ACCESS LEVEL
Water, Sanitation, and Hygiene for Health Activity (W4H)	Ghana W4H Performance Evaluation, 2019	(1) Interview and FGD quantitative data	Restricted Public
RAPID Performance Evaluation	RAPID Performance Evaluation, 2020	(1) Interview quantitative data	Restricted Public
COVID	WASH and COVID Trends and Futures Analysis, 2020	WASH and COVID Trends and Futures Analysis, 2020 (5) GeoPoll Datasets – Democratic Republic of the Congo (DRC), Mozambique, Ghana, Senegal, and Kenya	Restricted Public
COVID	WASH and COVID Trends and Futures Analysis Ghana Follow-on, 2020	Ghana follow-on GeoPoll survey	Restricted Public
Kenya Rural Sanitation	Deep Dive Market Assessments at a County Level in Kenya, 2021	(1) GeoPoll survey (2) Interview quantitative data	Public
Kenya Rural Sanitation	Approaches for Sanitation Access in Pastoralist Areas within the Arid and Semi-arid Lands of Kenya, 2020-2021	(1) Interview quantitative data (2) Observation data	Public
Liberia MBS	Research and Learning for Rural Sanitation in Liberia, 2021	(1) Customer survey (quantitative) (2) Value chain survey data (quantitative)	Public
COVID-19 Longitudinal Data Collection	WASH and COVID-19 Longitudinal Data Collection, 2021 - COVID-19 Impacts on WASH Access	(1) Afghanistan July survey (2) Afghanistan November survey (3) Ethiopia July survey (4) Ethiopia November survey (5) Liberia July survey (6) Liberia November survey (7) Madagascar July survey (8) Madagascar November survey (9) Tanzania November survey (10) DRC November survey (11) Ghana November survey (12) Mozambique November survey (13) Kenya November survey	Public
Rural Access to New Opportunities (RANO) WASH Performance Evaluation	RANO WASH Performance Evaluation, 2021	(1) Interview quantitative data	Public
Senegal MBS	Research and Learning for Rural Sanitation in Senegal, 2021	(1) Entrepreneur interview quantitative data (2) Rural sanitation enterprise data (3) Segal brand survey data	Public

APPENDIX 3: WASHPaLS ACTIVITIES BY COUNTRY AND COMPONENT

Country	WASHPaLS Activities	C1 Buy-In	CLTS	C2 MBS	HE	C3 Grants
Afghanistan	COVID Longitudinal Data Collection	■				
Bangladesh	icddr,b Poultry Cooping Grant					■
	icddr,b mHealth Grant					■
Cambodia	Cambodia Integrated Nutrition, Hygiene, and Sanitation Activity (NOURISH) Impact Evaluation	■				
	Community-led total sanitation (CLTS) Qualitative and Quantitative Research		■			
	Market-based Sanitation (MBS) Enterprise Viability Research			■		
Democratic Republic of the Congo (DRC)	COVID Trends and Futures Analysis	■				
	COVID Longitudinal Data Collection	■				
Ethiopia	MBS Decision Support Tool	■				
	Safe Play Spaces Research				■	
	Growth through Nutrition Assessment	■				
	MBS Support to TRANSFORM Water, Sanitation, and Hygiene (WASH)			■		
	COVID Longitudinal Data Collection	■				
	Splash Hygiene Nudges in Schools Grant					■
Ghana	Water for Health Performance Evaluation	■				
	CLTS Subsidy Study		■			
	CLTS Qualitative and Quantitative Research		■			
	COVID Trends and Futures Analysis	■				
	COVID Longitudinal Data Collection	■				
India	MBS Enterprise Viability Research			■		
	Gram Vikas Behavior Change/Child Feces Management Grant					■
Kenya	Kenya Integrated Water Sanitation and Hygiene Activity (KIWASH) Performance Evaluation	■				

Country	WASHPaLS Activities	C1 Buy-In	CLTS	C2 MBS	HE	C3 Grants
	Review of Sanitation Access in Pastoralist areas within the arid and semi-arid lands	■				
	Resilient Arid Lands Partnership for Integrated Development (RAPID) Performance Evaluation	■				
	RAPID Impact Evaluation	■				
	COVID Longitudinal Data Collection	■				
	Menstrual Health Management (MHM) in the Workplace Activity	■				
	MBS Deep Dive Market Assessment	■				
	COVID Trends and Futures Analysis	■				
Laos	Subsidy Study		■			
Liberia	Sanitation Market Assessment	■				
	COVID Longitudinal Data Collection	■				
	CLTS Quantitative Research		■			
Madagascar	Rural Access to New Opportunities (RANO) WASH Performance Evaluation	■				
	COVID Longitudinal Data Collection	■				
Mozambique	Gender and Hygiene Formative Research	■				
	COVID Trends and Futures Analysis	■				
	COVID Longitudinal Data Collection	■				
Nepal	MHM in the Workplace Activity	■				
	International Development Enterprises (iDE) Sanitation Sales Agent Gender Grant					■
Nigeria	MBS Enterprise Viability Research			■		
Philippines	IDinsight Handwashing Nudges Grant					■
Rwanda	COVID Trends and Futures Analysis	■				■
Senegal	Sanitation Market Assessment	■				
	COVID Trends and Futures Analysis	■				
Tanzania	COVID Longitudinal Data Collection	■				
Uganda	Water Trust Poultry Management Grant					■
	EarthEnable Improved Flooring Grant					■
Zambia	CLTS Quantitative Research		■			

APPENDIX 4: PUBLISHED MANUSCRIPTS

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