washplus

Supportive Environments for Healthy Communities

WASHplus End of Project Report

WHAT WE DID AND WHY IT MATTERS

JULY 2016

USAID

FROM THE AMERICAN PEOPLE

ABOUT WASHPLUS

The WASHplus project supports healthy households and communities by creating and delivering interventions that lead to improvements in WASH and household air pollution (HAP). This multi-year project (2010-2016), funded through USAID's Bureau for Global Health and led by FHI 360 in partnership with CARE and Winrock International, uses at-scale programming approaches to reduce diarrheal diseases and acute respiratory infections, the two top killers of children under age 5 globally.

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ACRONYMS

CCEB	Catalyzing Clean Energy Bangladesh
FSM	Fecal Sludge Management
GACC	Global Alliance for Clean Cookstoves
ICDDR,B	International Center for the Control of Diarrheal Disease Research, Bangladesh
ICS	Improved Cookstoves
ISO	International Standards Organization
JMP	Joint Monitoring Programme
KM	Knowledge Management
M&E	Monitoring and Evaluation
MGE	Ministry of General Education
MHM	Menstrual Hygiene Management
NACS	Nutrition Assessment Counseling and Support
NTD	Neglected Tropical Diseases
ODF	Open Defecation Free
PPPHW	Global Public-Private Partnership for Handwashing
PSI	Population Services International
SDA	Small Doable Actions
SDG	Sustainable Development Goals
SO	Strategic Objective
USAID	United States Agency for International Development
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization

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INTRODUCTION

WASHplus, USAID's global field support water, sanitation, and hygiene (WASH) project (2010–2016), added six years of stories, results, and studies to the evidence base for WASH and clean cooking interventions. Zambian adolescent girls now have access to private menstrual hygiene facilities and supplies in schools; Malian households have built improved latrines on their flood-prone or rocky soils, mothers in Bangladesh help ensure a feces-free environment by depositing their babies' feces in the latrine, and Nepali families have access to more affordable and appropriate improved cookstoves tested in their communities. Underlying individual stories are results the project has recorded through endline data collection in Kenya and Mali, a post-intervention study in Benin, and an outcome study on school attendance in Zambia. Providing WASH to schools significantly reduced absenteeism for both girls and boys. Hard-to-reach areas of Mali once considered hopeless candidates for sanitation interventions have transformed into open defecation free communities. Improvements in quality and location of handwashing stations in Kenyan households have increased handwashing behaviors, i.e., near the kitchen and/or outside a latrine. Community-led total sanitation (CLTS) strengthens households and communities through deliberate inclusion of the elderly and weak who are typically left out of improvements.

WASHplus shared its analysis and reflection on accomplishments and disseminated lessons learned through peer-reviewed journal articles, key publications, including a publication on WASH and nutrition, *Improving Nutrition Outcomes through Better Water, Sanitation, and Hygiene*, major conferences, and webinars on topics ranging from consumer preferences and willingness to pay for improved cookstoves, habit formation, costing of handwashing, and integrating WASH with nutrition and neglected tropical diseases (NTDs).

WASHplus supported USAID's thought leadership in several key areas:

- Advocating to keep the H of hygiene as a Sustainable Development Goal (SDG) target
- Introducing habit theory to WASH, with specific applications to handwashing in Zambia and Bangladesh
- Applying a behavior-centered lens to clean cooking interventions
- Moving the WASH integration agenda forward through conceptual contributions to advocacy, policy and program guidance, and field activities in WASHplus countries
- Focusing on options to work more effectively within local systems and strengthen governance capacity of local government and other partners to enhance sustainability

Background

Over the past six years, WASHplus has sought to support healthy households and communities through actions from the local to the global level to improve access, practice, and health outcomes related to WASH and clean cooking. WASHplus responded to USAID priorities and needs both at the central and country levels in the context of the USAID Water and Development Strategy, which aligns all USAID water-related funding under two strategic objectives (SO): improving health outcomes through the provision of sustainable WASH and managing water to enhance food security. WASHplus also contributed to other USAID priorities, such as Feed the Future and the Multi-Sectoral Nutrition Strategy 2014-2025, through expertise and experience integrating WASH into other sector programs.

As USAID's central procurement mechanism for supporting global technical leadership and Mission-level environmental health programming, WASHplus was the latest iteration in a 30-plus year legacy of Global Health Bureau investments in environmental health:

- WASH: 1981–1994
- VBC (Vector Biology & Control): 1983–1993
- Environmental Health Project (EHP): 1994–2004
- Hygiene Improvement Project (HIP): 2004–2010

WASHplus was guided by the USAID-developed WASH Framework for Impact, which relies on three pillars to achieve sustainable improvements in WASH: access to hardware, hygiene promotion, and an enabling environment. Mindful of gender and equity concerns to reduce gaps among previously underserved populations, WASHplus tackled the needs of both households and schools—and focused on service sustainability to achieve water and sanitation for all.

While most WASHplus work was WASH-related, the project also responded to USAID priorities and needs globally and nationally in the context of USAID's commitments to the Global Alliance for Clean Cookstoves (GACC) and the cookstove sector as a whole. These commitments support the adoption of affordable stoves that require less fuel to meet household energy needs and release fewer pollutants as a means to improve health, reduce environmental degradation, mitigate climate change, foster economic growth, and empower women.

As designed by USAID, the goal of WASHplus was to "Promote healthy households and communities through improved Water, Sanitation, and Hygiene and Clean Cooking practices in order to reduce diarrheal diseases and pneumonia."

Four strategic SOs were identified to address this goal:

1. **Increase availability and use** of proven high-impact WASH and clean cooking interventions

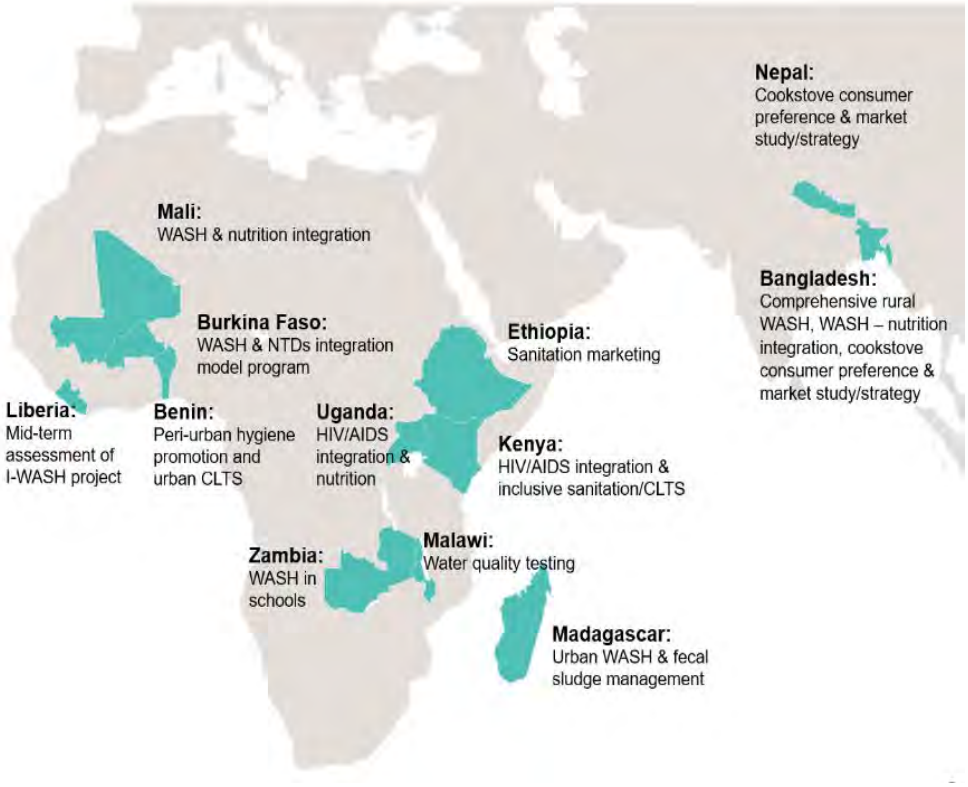
2. Develop and implement strategies for **integration** of WASH and clean cooking interventions into other health and non-health programs

3. Support USAID's participation in **strategic partnerships** with other donors and cooperating agencies

4. Develop and test new and **innovative approaches and tools** for implementation of high-impact WASH and clean cooking interventions

WASHplus, a multi-year Cooperative Agreement, was led by FHI 360 with core partners, Winrock International and CARE, and with access to a broad range of resource partners (pictured here).

The project was designed to be responsive to USAID global and country needs; support USAID's contributions to global guidance, policy, and best practice; ensure that these informed country programming; and synthesize lessons from field experience to inform the global agenda. The assistance WASHplus provided ranged from broad WASH support over multiple years to focused clean cooking activities and short-term support to Missions. WASHplus worked in 12 countries: Bangladesh, Benin, Burkina Faso, Ethiopia, Kenya, Liberia, Madagascar, Malawi, Mali, Nepal, Uganda, and Zambia.



How this Report is Organized

This introduction concludes with a graphic "WASHplus Accomplishments at a Glance."

The body of the report is comprised of two major sections. The first, Cross-Cutting WASHplus Themes, is organized around these themes that guided the project's action and learning from the outset (e.g., the project SOs) and/or emerged through reflections on principal lessons from the project's overall experience. WASHplus organized its global End of Project event according to the themes presented here, focusing on "What We Did" and "Why It Matters":

- A behavior-centered approach
- Integration
- Partnerships
- Innovation, including a special focus on sanitation
- Sustainable WASH systems
- Clean cooking

The key themes section concludes with a brief summary of WASHplus contributions in the important cross-cutting areas of Monitoring, Evaluation, and Learning and Knowledge Management.

The second section of the report is organized by country. There is an overview of activities from each country (both for WASH and Clean Cooking) organized into three sections: What We Did, Why It Matters, and Key Results. When available, as was the case for most countries, this last subsection includes quantitative information.

The report includes three annexes listing WASHplus publications, webinars, and conferences. Through the document as appropriate, hyperlinks to key documents offer readers the ability to access additional, more detailed information.

WASHPLUS ACCOMPLISHMENTS AT A GLANCE

ODF status: 146 villages in Mali and 685 villages in Bangladesh were certified open defecation free.

WASH in Schools: improving WASH in schools in the Eastern Province of Zambia reduced absenteeism by 36%.

Inclusive sanitation: households with seniors or with family members living with HIV/AIDS are more likely to have a latrine in Kenya.

Drinking water: 39,200 people gained access to an improved water source in Mali and 94,471 in Bangladesh.

Behaviors changed: measured less open defecation, more hygienic disposal of child feces, more functional handwashing stations and more chlorination for water treatment in Mali and Kenya

Innovation: applied innovation in 15 different ways through thought leadership, approaches, and products—menstrual hygiene, clean cooking, sanitation, integration, and more

Policy guidance: influenced WASH and clean cooking policy and strategies of host governments and USAID through national strategies, local monitoring tools, advocacy, and capacity building.

CROSS-CUTTING THEMES

The following sections describe how the project arrived at its results and the approaches it used to advance healthy households and communities. As the project matured, these elements emerged across countries and activity streams as important contributors to the overall goals of the project.

Behavior-Centered Approach

What We Did

WASHplus focused its technical assistance and global leadership on behavior-centered approaches that target improved WASH and clean cooking practices. The project focused on WASH behaviors because a strong evidence base supports that consistent, correct, and sustained practice of these behaviors (handwashing with soap, safe disposal of feces, safe handling and treatment of household drinking water) are associated with reduced diarrhea. See the learning brief, *Behavior-Centered Approaches to Improving Health Outcomes,* for a comprehensive look at WASHplus's behavior change methodology and practices.

The Small Doable Action (SDAs) approach was the hallmark of most WASHplus country-level activities and resonated with country counterparts and development partners. The SDA approach segments the path to the ideal into feasible steps and moves forward with an effective programming response that while not the ideal, progressed in a positive direction and achieved some of the desired impact. WASHplus emphasized negotiating improved practices rather than focusing on educating households to adopt ideal practices. Negotiation requires active engagement between outreach worker and audience, whether a mother, a household, or a group. It employs principles used in interpersonal counseling, while incorporating the SDA approach. Through negotiation, current practice is assessed, "good" WASH practices are reinforced, and one or two SDAs are negotiated, working with individuals to overcome barriers to change and reinforcing facilitators. This negotiation approach considers the cross-cutting behavioral determinants that influence many WASH behaviors—access to key products and services, perceived consequences, and social norms.

Specific SDAs ranged from safe water handling, safe disposal of feces, handwashing at critical times, water source protection and access, food hygiene, and menstrual hygiene management (MHM). In Bangladesh, vulnerable communities took part in iterative exercises to identify SDAs for safe disposal of infant and child feces by age cohort. WASHplus engaged households as consultants to try options such as potties and agricultural hoes (used as scoops) in their homes and/or develop feasible and effective strategies for disposing of feces from cloth, potties, and the courtyard. In Uganda, WASHplus developed a series of SDAs to promote improved food

hygiene. The learning brief, *Small Doable Actions: A Feasible Approach to Behavior Change,* details the WASHplus SDA approach and provides more country-specific examples.

WASHplus also encouraged local governments, communities, and households to undertake "small doable" improvements in water and sanitation infrastructure (hardware) that further improved WASH practice, such as patching leaky latrines or hanging tippy tap handwashing stations. Going beyond individual and household behavior change, WASHplus applied the SDA concept to the organizational context. While assisting national nutrition programs to integrate WASH into the national NACS or Nutrition Assessment Counseling and Support Policy and Training documents in Uganda (and other countries as well), the ideal would have been to add comprehensive policy language and hold a three-day WASH training. Instead, WASHplus improved WASH language (e.g., changing from "practice hygiene" to "wash hands before cooking and feeding and after defecation or baby changing"); added key reference sheets (e.g., how to clean drinking water through several effective water treatment methods); and conducted a two-hour training component and supplied links to more comprehensive training and references.

In 2012, WASHplus began exploring how the science of habit formation could be applied to consistent and sustained handwashing improvement. Working with habit specialist Dr. David Neal, WASHplus identified six principles for creating greater initiation and maintenance of handwashing and then further adapted the principles to other WASH behaviors. WASHplus applied the principles of habit formation to handwashing efforts in Zambia through its SPLASH (Schools Promoting Learning Achievement through Sanitation and Hygiene) project, where schoolchildren practiced daily group handwashing at newly installed multi-tap handwashing stations. While providing hardware alone (such as the handwashing stations) does not necessarily lead to improved or sustained practice, it addressed two of the six principles of habit formation, ensuring the needed supplies and providing a visual cue to the behavior. Effort was eliminated, another of the principles of habit formation, by installing the *enabling technology,* the handwashing station. The daily, mandatory handwashing leveraged context by *fashioning an event* of the behavior, another of the principles; *fostered procedural memory* through the daily repetition; and lastly songs and school club activities encouraged *meaning-making* about habit.

Across country-level activities, WASHplus invested in building the capacity of district governments, local NGOs, and USAID implementing partners to integrate WASH and nutrition, WASH and HIV, WASH in Schools, as well as strengthen their application of behavior-centered approaches to change WASH behaviors. Together with counterparts, WASHplus developed capacity-building materials and job aids, and trained trainers to cascade training sessions widely in Zambia, Uganda, Bangladesh, Mali, and Kenya.

Lastly, WASHplus introduced the classic marketing elements of product, price, place, and promotion to guide strategic marketing of improved cookstoves at the global and country level. In Bangladesh and Nepal, WASHplus incorporated an audience research method called Trials of Improved Practices, or TIPs, to understand household perspectives of different cookstoves. The project learned that existing cookstoves were not large enough to accommodate all kinds of

cooking, such as holiday cooking, animal feed, or liquor, so the traditional stove was still used alongside the new, improved stove. Because cooks associated leaping flames with efficient cooking, they unnecessarily overloaded the new improved cookstoves with extra wood. These findings gave insight into point-of-purchase consumer education so consumers would use stoves correctly, achieve greater satisfaction, and realize fuel and cost savings.

Why It Matters

Decades of interventions focusing on increasing access to WASH facilities without effectively attending to the related behaviors explain the failure to see desired health and social benefits. Likewise, promotion and social mobilization without increasing access to and use of enabling hardware leaves children singing the happy hygiene song yet running to the bush when it's time to take care of business.

Sustaining behavior change has continued to be a challenge and WASHplus's exploration and application of habit theory provides a promising avenue to improve sustainable change. The focus on comprehensive, behavior-centered programming contributes to best practice and leaves in place a cadre of committed and capable colleagues, as well as a legacy of tools to continue working toward sustained WASH improvement. The five principles of WASHplus's behavior-centered approach, detailed in the behavior change learning brief (referenced above), can help guide WASH practitioners in the future.

With renewed country commitments to achieve the SDGs, to open defecation free nations, and to the acknowledgment that improved WASH is essential to child nutrition and growth, the WASHplus strategic behavior-centered approach offers useful tools and methodologies to achieve success.

Integration

What We Did

Integration was a core strategic objective of the project, and almost all WASHplus implementation countries had an integration component. WASHplus integrated WASH into HIV in Kenya and Uganda. These were deliberate integrated programs implemented with HIV funding. In Kenya, WASHplus also integrated inclusive sanitation into the Kenya WASH-HIV program to bring WASH to all vulnerable populations.

In Mali, WASHplus designed an integrated program of WASH and nutrition, while in Uganda the project integrated nutrition where possible into the WASH-HIV program and developed a card to promote good food hygiene practices. In Bangladesh, WASHplus collaborated with Feed the Future programs to integrate WASH, especially handwashing before cooking and feeding, but also focused on safely disposing of infant poo.

USAID's NTD program provided WASHplus with funding to explore ways to integrate WASH and NTDs, and the project tested a WASH-NTD program model in Burkina Faso. Finally, WASHplus implemented a large WASH in Schools program in Eastern Province, Zambia, called SPLASH. This was funded with Water directive money channeled through the education sector and aimed for both WASH and education outcomes. The second half of this report goes into more detail about what we did, including key results, at the country level.

WASHplus embraced the concept of integration on a continuum—where possible developing deliberate integrated programs and where not, integrating WASH as opportunities unfolded. The continuum moves from: sectoral programs that deliberately "co-locate" in the same geographic area reaching the same target beneficiaries, to sectoral programs that "share tools and approaches," which heighten collaboration and communication between sectors, and finally to sectoral programs working deliberately together to plan and implement joint programming in two or more sectors. At this end of the continuum, the different sectors recognize the value to each sector of integrating and embracing the potential for an even higher level outcome than sectors could attain separately. Two project learning briefs detail WASHplus integration activities and approaches: The Power of Integration to Multiply Development Impact and Integrating WASH and Nutrition. WASHplus did not shy away from integration because it could not implement the ideal, rather the project applied the SDA approach and integrated activities where it was possible.

WASHplus also carried out integration across different levels of the system, such as at the national level with government officials, but also at the provincial and district level, i.e., training local staff in WASH-HIV integration in Kenya, and working through projects with a mandate to reach households and communities. So, while in Kenya WASHplus was considered a "national" program, it trained public health officials throughout the system to the subcounty level and engaged USAID, the Centers for Disease Control and Prevention, and other partners working at the local level.

WASHplus shared its experience in integrated programming with global actors and partnered with different efforts to advance integration in various ways. The project integrated WASH into NACS materials; updated the Country Operating Plan Toolkit on how to integrate WASH into PEPFAR care and support programs; played a key role in advancing the document, Improving Nutrition Outcomes with Better Water, Sanitation and Hygiene, jointly published by the World Health Organization (WHO), UNICEF, and USAID; and participated in a range of different working groups on WASH-NTDs and Clean, Fed & Nurtured, a community of practice that spans WASH, nutrition, and early childhood development.

The project leaves behind a legacy of tools and publications on integration; see Annex 1 for a list by category.

Why It Matters

WASH itself already models integration as it links water, sanitation, and hygiene. Adding in other elements and sectors enhances its holistic development potential. The actions of a single sector cannot bring the transformative, sustained changes required to improve the lives of people living in poverty. Horizontal rather than vertical programming provides an opportunity for a more integrated approach that mirrors people's lives. However, it is difficult to measure and demonstrate the added value of integrated programming so donors are often reluctant to support integration efforts without proof that they enhance results.

The varied integration experience base from numerous WASHplus countries—a program model in WASH-NTD integration in Burkina Faso, positive results on WASH and nutrition in Mali, inclusive sanitation in Kenya, and program models for infant feces disposal and food hygiene—contributed to the global evidence base, provided examples and lessons from on-the-ground implementation and highlighted some of the benefits of integration.

When discussing the WASHplus integrated NTD activity in Burkina Faso, the district agriculture, water, sanitation and food security advisor said, "We used to work together 30 years ago and then we stopped. This is important and I am happy that WASHplus is here" to move in that direction.

Partnerships

What We Did

Development practitioners today consider partnering a smart and efficient way to enhance synergies and impact in a world of limited resources. Embracing this principle and recognizing that the WASH sector rarely operates in isolation, WASHplus created and maintained strong partnerships that cut across sectoral platforms. WASHplus established partnerships that addressed specific technical components such as: applying learning from WASH to the clean cooking sector; advocating for increased attention to MHM; and contributing to global guidance in monitoring and evaluation and in elaborating the global SDGs. Effective partnering has been integral to achieving the project's results.

A key strategy for WASHplus was identifying diverse NGOs, universities, and private sector resource partners to call on when needed to provide short and long-term technical assistance. The range of expertise complemented or supplemented the core WASHplus partners: FHI 360, Winrock International, and CARE. SecondMuse supported WASHplus communication and knowledge management activities. WASHplus used partners for innovative research activities: funding iDE to apply its Cambodia approach to refine the design of latrine products and develop a business model for manufacturing, selling, and delivering these products to Ethiopian

households. The Berkeley Air Monitoring Group tested a locally produced advanced biomass cookstove among households in Kenya and a range of improved cookstoves in Bangladesh and Nepal to support the scale up of improved cookstove use.

One key partnership strategy was to work closely with government counterparts—whether it was at the central, regional, or district level. These partnerships ensured that WASHplus work was fundamental within the national strategy. Embedding WASH activities within the government strategy supported sustainability. In Kenya, WASHplus efforts helped to improve policy, and project materials endorsed by government stakeholders were used well beyond the project. In Burkina Faso, government counterparts are poised to incorporate a WASH component into a new grant for NTDs, understanding that drugs alone cannot eliminate these diseases.

Another effective way WASHplus found to engage at the country level was to work with locally established resource partners and apply their knowledge of local context and partners to enable swift program start-up. WaterAid, a well-established NGO in Bangladesh, used its extensive hardware and governance capacity in remote areas to lead the multi-year WASHplus efforts that increased access to WASH in hard-to-reach areas in southwestern Bangladesh. CLTS-like triggering mobilized communities to focus on *improving* substandard latrines since most Bangladeshi households already have some sort of latrine (though it likely kicks back fecal effluent into the environment). This required additional partnership and liaison with sanitation entrepreneurs to better link demand creation and locally available supply.

In Madagascar, WASHplus partners Practica Foundation and Water and Sanitation for the Urban Poor piloted the feasibility of a small scale public-private partnership for fecal sludge removal and provision of clean drinking water in peri-urban areas. WASHplus adapted the fecal sludge technology to fit the local context, initiated a market-based service, partnered with local government to get land concessions to place the fecal waste, identified entrepreneurs, and developed a viable business model. Practica built on this work to further refine the technology and approach and extend the experience into a new area at a much larger scale.

The WASHplus partnering strategy extended beyond consortium resource partners to embrace international organizations such as GACC, the Joint Monitoring Programme, the Global Public-Private Partnership for Handwashing (PPPHW), Rotary International, UNICEF, The World Bank, and WHO. In WASHplus country programs, national governments and USAID implementing partners served as critical partners as were organizations in other sectors with which WASH and clean cooking engaged.

WASHplus supported the launch of and strategic planning for the GACC by serving in chair, coordinator, and member roles for the M&E, Technology and Fuels, and Understanding Consumers working groups. WASHplus also collaborated with the alliance on the development of a Market Research guide for the clean cooking sector. And most importantly, WASHplus participated in the ISO (International Standards Organization) Technical Committee 285 on clean

cookstoves and clean cooking solutions, through the U.S. Technical Advisory Group, the Social Impacts Working Group, and the Communications Task Group.

Why It Matters

Through strategic partnerships with and/or on behalf of USAID, WASHplus amplified its investments, enriched its offerings, and ensured better reach and sustainability of WASH activities.

Partnering for Advocacy. UNICEF and the Joint Monitoring Programme convened a communication and advocacy technical working group to promote a dedicated WASH goal with corresponding targets and indicators in the SDGs. WASHplus and PPPHW specifically advocated to include hygiene. While the various constituency organizations tried to speak with one voice, they often had different priorities. As a result, the partners had to negotiate for the policy asks most likely to be adopted. Agreeing on a singular strategy amplified impact well beyond what WASHplus could have done alone, and hygiene was explicitly included as part of the sanitation target.

Engaging Global Partners. Developing voluntary international performance standards for cookstoves and cooking fuels is absolutely essential to ensure that stoves achieve energy and health impacts. Whether stoves are made through cottage industry or international companies, standards ensure uniformity of acceptable emissions and efficiencies. In Bangladesh, WASHplus partnered with GACC and USAID's Catalyzing Clean Energy in Bangladesh (CCEB) project to design and implement a consumer preference and willingness-to-pay research study. The trials introduced different stove models and found that no stove met consumer needs, nor were consumers willing to purchase the relatively expensive improved cookstove. This finding encouraged CCEB to support domestically produced stove alternatives. The partnership allowed WASHplus research to be applied practically, and helped CCEB make informed programming decisions.

Championing New Ideas. WASHplus and USAID engaged the WHO and UNICEF to develop a "how to" document on integrating WASH and nutrition. Actors from different sectors and organizations wrote the sections—and revisited the purpose, audience, and content repeatedly. The extensive, iterative process strengthened the output, helped to engage all stakeholders, and motivated them to own the joint document, which was launched with great fanfare by all three organizations on World Toilet Day 2015.

Energizing a Movement. Menstrual hygiene management is key to keeping girls in school, which has a lifelong impact. Better educated girls are more likely to delay marriage and pregnancy; raise healthier children; engage in more gainful employment; and each year a girl stays in school, HIV rates are reduced. The confluence of MHM–related events in recent years united a core group of champions committed to bringing menstrual hygiene to the forefront of the WASH in Schools/girls education agenda. From different organizations, these individuals have created an informal partnership that has strengthened the conversation, expanded MHM

advocacy and publications globally, and promoted Menstrual Hygiene Day. WASHplus has built on this platform of committed professionals to launch a DC Coalition for Menstrual Hygiene Day and foster activities throughout the year.

Innovation and Sanitation

What We Did

Having innovation as a strategic objective challenged WASHplus to focus on needs and opportunities for innovation and to foster innovative approaches to sanitation, hygiene, clean cooking, and integration. Considering what is meant by innovation, WASHplus recognized that innovations can be tangible or intangible. They can be brand-new or an application of something in a new way or new setting. The project considered innovations to be successful if they resulted in improvements in efficiency, effectiveness, quality, or social outcomes/impacts.

In the past, when toilets were full, people used to empty them without following any protocol and threw their sludge into the environment. That was unhealthy for the whole community.

—Claudine Ravaoniriana, General Secretary, Ambositra, Madagascar

WASHplus applied innovation to:

- Products—changes in products, for example, an improved cookstove
- Approaches or processes—changes in how we do something, such as how a product or service is created, delivered, or used, for example, a business model for sanitation marketing
- Thought leadership—changes in the underlying mental thinking and models that shape what we do, for example, applying habit theory to WASH behaviors as discussed in the section on behavior-centered approaches above

A brief review of ***What WASHplus Did*** to apply innovation to sanitation and other areas and ***Why It Matters*** appears below:

Sanitation

When WASHplus began in 2010, USAID was putting increasing focus on sanitation and designated a small amount of core funds. In terms of innovation, this mandate meant an opportunity to explore new and effective ways to get feces completely out of household and community environments. Innovative sanitation approaches within the project ranged from small innovation grants to address leaky latrines to sanitation marketing and fecal sludge management.

What to Do With Infant Poo. So much attention goes to getting feces out of the environment to prevent diarrhea and enteric dysfunction for children under 5—but not enough attention

goes to what happens to the poo of under-fives. In Bangladesh, WASHplus developed age-specific SDAs for getting infant poo out of the environment.

Sanitation Marketing in Ethiopia. With co-funding from Vitol foundation, WASHplus collaborated with iDE to use human-centered design to prototype improved slabs and pit linings that are aspirational and affordable and refined a business model to market these products in four regions of Ethiopia. This work supported government initiatives to set the stage for regional scale up of sanitation marketing in one of sub-Saharan Africa's most promising markets. A full report and learning brief provide a detailed look at this activity.

Inclusive Sanitation in Kenya. WASHplus developed options for latrines to meet needs of vulnerable and mobility challenged populations in Kenya. As a result, inclusive sanitation is now part of CLTS policy in Kenya. A number of stories from the field capture the personal impact of these innovations.

Latrine Designs in Mali, Kenya, and Uganda. In the past CLTS programs avoided working in some regions of Mali because digging a latrine could be extremely challenging in sandy, rocky, and flood prone areas. WASHplus designed and promoted different pit options for each of these challenging geographies that were durable and will not collapse. Mali included these latrine designs in its CLTS guidelines and created posters that have been distributed to the relevant regions.

Sand Envelopment to Filter Leaky Latrines. To prevent latrine pits from leaching fecal matter into the environment, WASHplus contracted with ICDDR,B (the International Center for the Control of Diarrheal Disease Research, Bangladesh) to conduct experimental research to test the impact of wrapping latrine pits with sand envelopes to filter fecal contamination. The analyses suggest a sand barrier significantly reduced pathogens from leaching into shallow aquifers from intervention latrines compared to control latrines. This result has important public health implications. The sand barrier was more effective during the early follow up but decreased during successive follow-up rounds. Long-term data are essential to understand the efficacy of sand barrier to prevent pathogen leaching, and WASHplus is working with ICDDR,B to find additional funding to continue the study.

Fecal Sludge Management (FSM) in Madagascar. In 2010, WASHplus launched an effort to address FSM in Antananarivo, Madagascar. In collaboration with the Practica Foundation, WASHplus worked with one municipality to design and pilot an environmentally safe FSM service using appropriate technologies. Local stakeholders have used learning from this pilot to design and operationalize much larger FSM operations in other parts of the country. WASHplus produced a video exploring how the project's fecal sludge management pilot in Ambositra has been scaled up elsewhere in Madagascar to address a lack of effective waste management options.

Peri-Urban CLTS in Benin. In an effort to test a viable approach for addressing challenging sanitation conditions in peri-urban settings, WASHplus adapted CLTS tools and processes to the

peri-urban setting and piloted institutional and community triggering. The activity has the potential to be included in the national urban WASH strategy and scaled up. Access more stories on Benin here.

Other Areas of Innovation

Innovation was not limited to sanitation work. WASHplus also focused research, advocacy, and exploration of consumer preference on hygiene (particularly handwashing) and clean cooking.

Hygiene

Keeping the H in WASH. WASHplus and PPPHW's multi-year advocacy effort to make the case for including hygiene in the SDGs led to inclusion of a Water Goal and the inclusion of hygiene in target 6.2 under that goal. This matters because we know that what gets measured gets done. A target in which hygiene is included means that the international community will be able to better hold countries accountable for delivery of hygiene services in the places where they matter most. This will have a significant and lasting impact at the global level. As part of this effort, WASHplus promoted the use of an indicator to track handwashing, which is currently being used in Demographic and Health Surveys and the Multiple Indicator Cluster Survey. WASHplus produced a peer reviewed journal article presenting idea associating this indicator with diarrheal disease in children under 5, adding empirical validity to the use of this indicator.

Economic Analysis Tool. WASHplus applied the Water and Sanitation Program's Economics of Sanitation Initiative Toolkit tool to understand the cost of *not* investing in handwashing using secondary data from four WASHplus countries: Bangladesh, Kenya, Mali, and Zambia. The costing analysis showed that governments that invest in handwashing programs save money in health care costs, reduce incidents of diarrhea and acute respiratory illness and premature mortality, and improve productivity. WASHplus submitted a manuscript to a peer reviewed journal and is awaiting confirmation of acceptance.

Better Handwashing Facilities. To test the commercial viability of the Happy Tap in Bangladesh, WASHplus partnered with Watershed, which developed the low-cost handwashing device for use in Cambodia and Vietnam. Introducing an aspirational handwashing station will contribute to increased and sustained handwashing practice.

Science of Habit

WASHplus authored a paper with Catalyst Behavioral Sciences, *The Science of Habit: Creating Disruptive and Sticky Behavior Change in Handwashing Behavior,* which applies cutting-edge research on the brain and habit formation to the practical matter of changing handwashing habits. WASHplus applied this research to its work in the

I was in grade 5 when I reached puberty. I faced a lot of difficulties especially when I needed space to clean up and change. I was absent from school for five days each month. Then in 2013 SPLASH installed 20 beautiful toilets. At last I can stay at school and not miss any classes throughout the whole term!

—Grace, 16 year old student, Lundazi District, Zambia

field, emphasizing the importance of making handwashing a sustainable practice over time. A manuscript has also been submitted to AIM Public Health and is awaiting review and confirmation of acceptance.

Small Doable Actions for Food Hygiene. In recognition that diarrhea prevention does not begin and end with improved sanitation and water, WASHplus applied its SDA approach in southwest Uganda to make WHO's five keys to safer food actionable and created a job aid in multiple languages that has become part of the health workers' community outreach in the region. The burden of contaminated food is drastically underestimated, and this allows programs to start to address the issue more strategically. Food hygiene job aids were developed, incorporated into a WASH SDA toolkit, translated into local languages, and distributed to village health teams in Uganda.

Consumer Preference Approach to Clean Cooking. Through field research and cooking tests WASHplus applied the consumer preference approach to clean cooking in Bangladesh and Nepal. (See clean cooking section below for details). This research is a vital component of increasing adoption of improved cookstoves that local communities are willing to buy and use and replacing higher polluting/traditional cooking methods.

WASHplus focused its innovation lens on ways to integrate WASH into other sectors that would produce improved health outcomes. A few examples of cutting-edge integration applications are listed below. For a detailed look at the project's integration focus, see p. 8 of this report.

Integrating WASH and Nutrition. WASHplus was active in making the case and contributing experience for WASH and nutrition integration. See the publication list in Annex 1 for a list of the numerous WASHplus publications and stories on this topic and read the learning brief here.

Integrating WASH and NTDS. Burkina Faso served as the testing ground for WASHplus's WASH-NTD integration program. Very few integrated WASH-NTD programs exist, and the program model/toolkit WASHplus developed will be adaptable to other countries. See Country Profile on Burkina Faso for more details of this activity on p. 28

Comprehensive MHM in Zambia Schools. With a focus on keeping girls in school and changing gender norms, WASHplus implemented an innovative, comprehensive MHM in schools program as part of SPLASH, using the WASH Framework for Impact as guidepost. WASHplus conducted qualitative research in Zambia on the topic; read the full report here. See the publication list in Annex 1 for a list of MHM tools, resources, and stories and read

Sustainable WASH Systems

What We Did

Achieving comprehensive, far-reaching, and long-lasting change in the WASH sector requires understanding, analyzing, and strengthening the various interconnected parts of a system that need to work well to contribute to success and sustainability. Sustainable WASH services depend on governments meeting their commitments and carrying out essential functions at national, regional, district, and community levels. WASHplus ensured sustainability of its program investments by applying commonly agreed elements of good governance and the WASH Framework for Impact that allows the interplay of hardware, software, and the enabling environment. This "systems approach" in WASHplus programs pulled in complementary ministries, NGOs, community leadership, research groups, civil society, the private sector, and other stakeholders to engage in common action planning and commitment to WASH program outcomes. Specifically, WASHplus's sustainable systems approach included:

As SPLASH comes to a close this year, projects won't be left without sustainability, they will keep on, and the D-WASHE will ensure they serve their intended purpose.

— Samson Tembo, Secretary of the local government D-WASHE

Addressing WASH Challenges through Multiple Channels. In WASHplus's peri-urban neighborhood pilot program in Benin, the focus was on improving hygiene practices in households. The project reached target mothers through a network of women's cooperatives, health centers, schools, local government, the municipality, and community and faith-based organizations with hygiene improvement activities.

Addressing Good Governance of Development Interventions that Use Technical Assistance. Analyzing the strengths or weaknesses of the system within and outside of government where interventions occur, rather than simply engaging and building capacity of the sector and its technicians, led to strong, capable, and sustainable systems. In Kenya, Benin, and Zambia, WASHplus trained outreach or frontline WASH workers to improve their skill set, and at the same time built the capacity of the districts to monitor, supervise, and strategically plan for more investment in local WASH improvements. In Burkina Faso, WASHplus implemented a short NTD pilot program closely with the local government and partners already on the ground, making it likely that efforts can be more readily sustained.

Facilitating Local Solutions to WASH Challenges. The base of the system is the community or the household where the sanitation and hygiene improvements are expected to occur. WASHplus built its programs by building the base, especially through community-led or school-led total sanitation, allowing community members to generate solutions to problems such as open defecation, lack of handwashing stations, or operations and maintenance of facilities in institutions or in homes. In Kenya, households came up with solutions for inclusive sanitation challenges such as guide ropes leading blind people from the house to the latrine, and building upraised commodes for elderly or infirm latrine users.

Why It Matters

WASHplus's experience demonstrated that improving competencies in governance can be a highly strategic project contribution, with or without field-level implementation, and provide a viable way to maximize impact with limited resources and contribute to a sustainable way to manage those resources long term. The sustainable systems approach can have an impact beyond good governance, influencing policies as was shown in Benin, Kenya, and Zambia. It can also shift community norms toward adoption of hygiene and valuing MHM. Applying a systems focus to all field programs enabled WASHplus to incorporate elements of good governance in various ways, which led to strengthened local government structures successfully advocating for and obtaining additional WASH funding, especially for underserved areas, management of WASH in more holistic ways, and improvement of local WASH operations and maintenance capacity and systems.

Read more about WASHplus's approach in the learning brief *Good Governance: A Core Component of WASH Implementation*.

Clean Cooking

What We Did

For almost six years, WASHplus has provided important support to the clean cooking sector, including in-country research in Kenya, Bangladesh, and Nepal, and through support to the GACC and other U.S. government agencies and programs.

WASHplus has made significant contributions to the sector:

- Strengthening the behavior-centered approach to clean cooking, through specific consumer and market research methods that facilitate integrating supply and demand into strategic marketing approaches
- Facilitating consumer choice in country-level cookstove markets
- Supporting the development of international voluntary performance standards for cookstoves

Consumer Preference Trials for Improved Cookstoves

WASHplus collaborated with resource partner Berkeley Air Monitoring Group in Kenya to field test the locally manufactured Jiko Poa fuel efficient cookstove and found it reduced air pollution and households liked it because it uses little fuel, cooks quickly, produces less smoke, and looks modern. Results from this study informed USAID activities as well as the stove selection process for the Centers for Disease Control/National Institutes of Health indoor air pollution study for Kenya.

In Bangladesh and Nepal, WASHplus conducted a comprehensive assessment to better understand consumer needs and preferences as they relate to increasing the uptake of improved cookstoves (ICS), including household trials of ICS, fuel and stove use monitoring, and

two different assessments of consumers' perceived value of and willingness to pay for ICS. In Bangladesh, only one consumer purchased its trial stove though 80 percent preferred to keep the stove rather than receive a cash buyout. In Nepal, consumers were more likely to buy the stove, and 88 percent of those remaining kept the stove rather than receive cash. Three of five stove manufacturers whose stoves were included in Bangladesh accepted a stipend to modify their stoves based on consumer feedback.

WASHplus collaborated with GACC and iDE to develop a marketing and behavior change strategy for the uptake of ICS in Bangladesh, which identifies early adopter consumer segments for ICS and develops a marketing strategy around a classical marketing "4Ps model" (product, price, place, and promotion) for each. Results of the Bangladesh study were published via a full report, four-page brief, and a peer-reviewed journal article in the *Journal of Health Communication*.

Based on the outcomes of these studies, WASHplus was able to recommend to the Government of Nepal that these or similar improved stove types be included in the Clean Cooking Solutions for All by 2017 initiative, in the interest of expanding consumer choice with stoves that have been found to save fuel, appeal to consumers, and are accessible with appropriate financing options. Results of the Nepal consumer preference and willingness-to-pay study and its recommendations are available here.

Based on these consumer research studies, WASHplus developed a Cookstove Consumer Research Toolkit that helps guide development partners, stove manufacturers, mature NGOs, and others to conduct this mixed-method research to assess consumer preference and willingness to pay. The toolkit provides guidance on study management and logistics, vendor selection, sampling, stove selection, Institutional Review Board and ethical review, interviewer training, qualitative analysis, and report writing. It also uses a free "shareware" software platform to facilitate data entry and analysis, for paper or tablet-based data collection. The CSPro-linked toolkit includes six questionnaires, data entry templates for both paper and mobile-based data collection, and video tutorials for using the tools and the CSPro software-based data entry and analysis platform.

Why It Matters

To see desired health and energy benefits of clean cooking, households must essentially stop using traditional stoves and replace them with new improved stoves. Therefore, stove programs must develop marketing strategies that reflect consumer needs and wants, including the design or adaptation of stoves with desired attributes, priced within reach of bottom of the pyramid consumers, promoted with convincing appeals through trustworthy channels. The Cookstove Consumer Preference Toolkit can help guide evidence-based strategies that support adoption of improved cookstoves.

As a specific example of how consumer research can inform stove design and improve sales and uptake of improved cookstoves, the consumer preference research in Bangladesh showed that

cooks preferred a more stable stove than those used in the Trials of Improved Practice, one that could handle heavy pots full of rice and other festival foods. Responding to the research, Greenway modified their stove to produce the JumboStove that is selling well in India.

Monitoring and Evaluation

What We Did

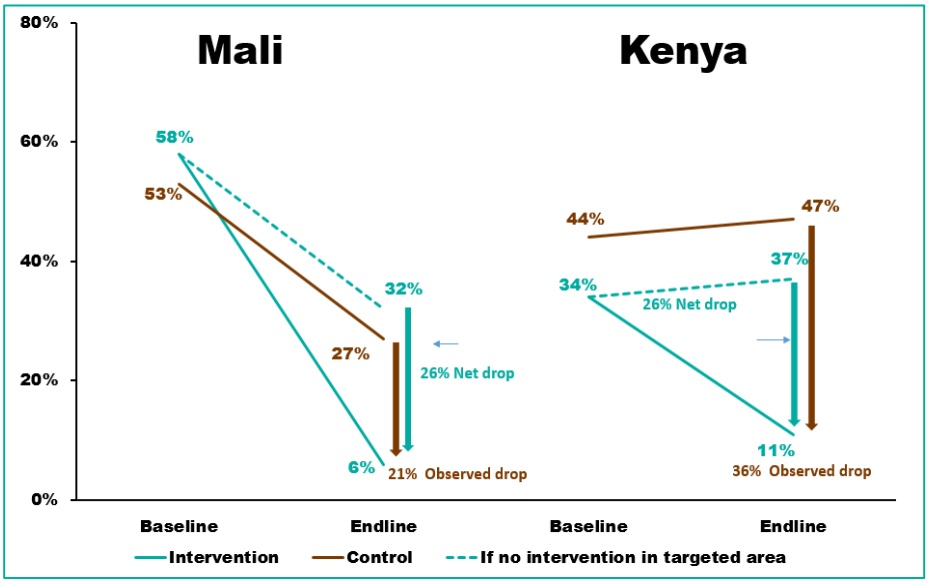
To determine project results at the country level and to conduct cross-country comparisons, WASHplus collected both monitoring and evaluation (M&E) data throughout the project, conducting baseline and endline, intervention vs. control group, or post-only designed surveys as well as formative research and specialized studies. Monitoring data were used to track output targets. Evaluation data were used to study outcomes and determine the effectiveness of the intervention through comparison of intervention and comparison groups, and when needed, studying whether intervention effects remained after the effect of confounders was controlled. WASHplus interventions targeted both households and schools. Evaluation data were collected at the household and school level. Household-level data were collected via household surveys generally using pre-post designs with a comparison group. The effect of WASH interventions at the school level was examined using a post-only design with an intervention and a comparison group, relying on repeated measures during three school quarters.

Common indicators across country programs targeting households included: communities obtaining open defecation free (ODF) status, household access to sanitation, disposal of child feces, access to improved water sources (if appropriate), presence of functional handwashing stations, and treatment of drinking water.

Why It Matters

In general, WASHplus achieved set targets, and in some instances exceeded them. For example, in Bangladesh, WASHplus set out to certify 512 ODF communities, and 685 achieved ODF status, surpassing targets by 34 percent. In Mali, WASHplus promised to certify 96 ODF villages out of a total of 180 targeted. By the end of the project, 146 had been certified, surpassing targets by 52 percent (see Figure 1).

Figure 1: Open Defecation Prevalence in Mali and Kenya



Evaluation data indicate that observed and net drops in open defecation, increases in the hygienic disposal of child feces, and increases in using chlorination for water treatment are higher in intervention areas than in control areas in both Mali and Kenya. The net increase in households having a functional handwashing station was 31 percent in Mali. In Kenya, however, the comparison group outperformed the intervention group by 12 percent (see Figure 2). Yet, in Kenya the net increase in handwashing stations at toilets was 11 percent. Inclusive sanitation efforts have generated the expected results; households with seniors or with proxies that measure the presence of family members living with HIV/AIDS are six to 21 times more likely to have a latrine following the WASHplus intervention (see Figure 3). The effectiveness of interventions carried out to reduce open defecation is demonstrated by the fact that CLTS–triggered villages and households visited by health workers to promote sanitation improvements are four to more than nine times more likely to have a latrine, in Mali and Kenya, respectively. In Bangladesh, on the other hand, where sanitation coverage was already high, WASHplus observed changes in the construction of latrines in areas prone to flooding and improvements in sanitation facility characteristics, aspects promoted by the intervention, which further demonstrate program effectiveness.

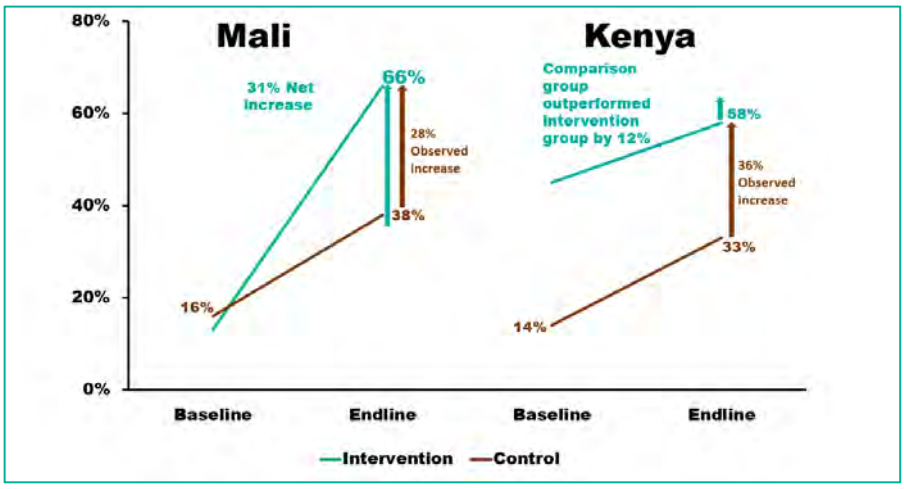
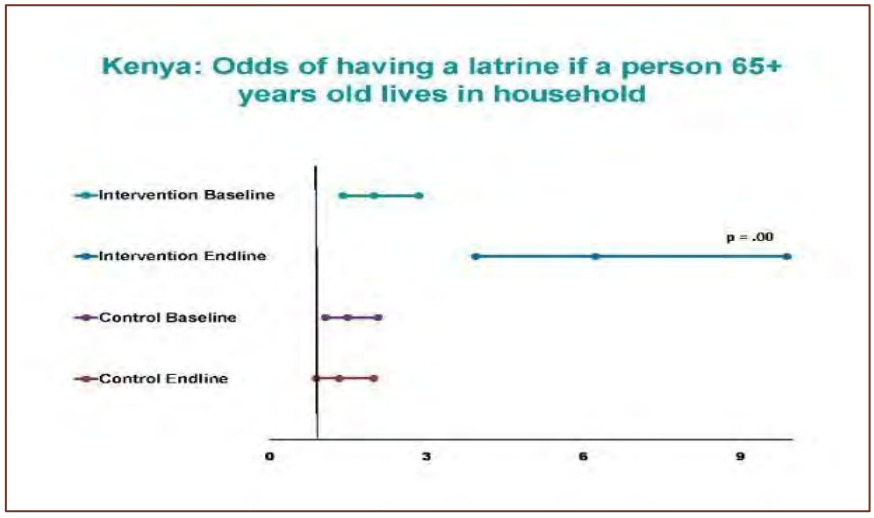


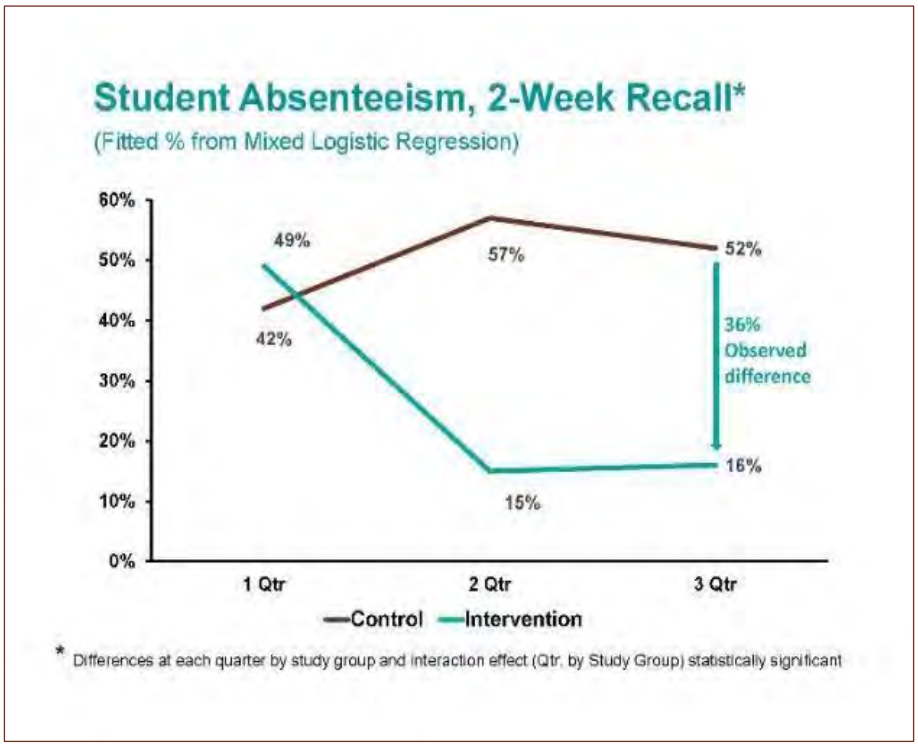
Figure 3: Latrine Ownership in Kenya Intervention Areas



Using a post-only design in Zambia, where WASHplus targeted schools, the project demonstrated a 36 percentage point difference in student absenteeism

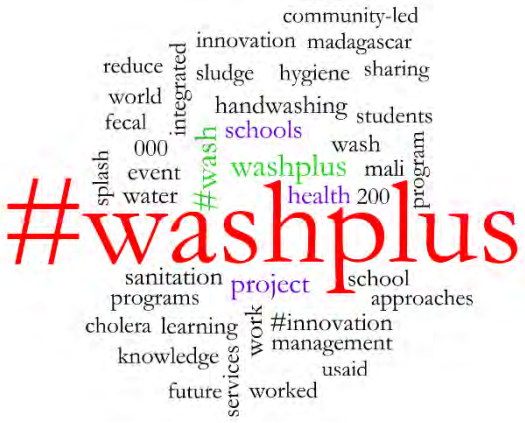
when comparing intervention schools with WASH and control schools without WASH at the end of the SPLASH project (see Figure 4). This large difference was present after controlling for confounding variables (presence of a school feeding program, presence of school improvement projects other than WASH, and school type). Read the full report here.

Figure 4: Student Absenteeism in Zambia's Eastern Province



Knowledge Management (KM)

Throughout its six years, WASHplus sought to share its program experience, products, and lessons learned with partners and other audiences in the countries where it works and globally.



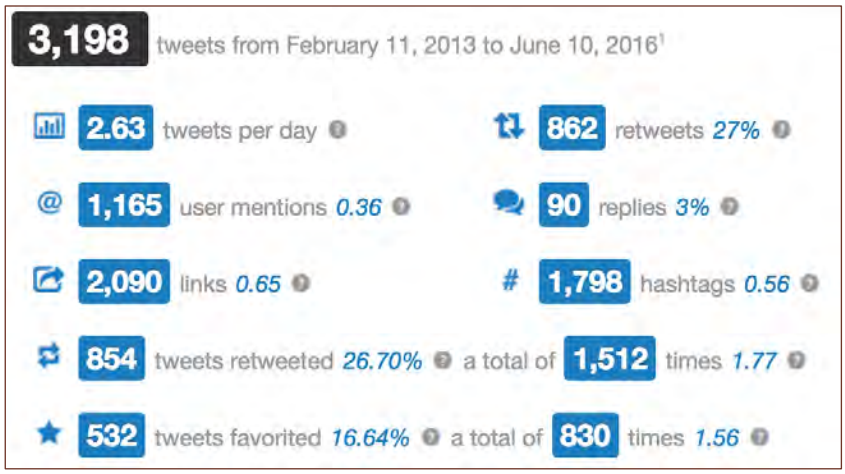
WASHplus Conversation Cloud
Words associated with WASHplus in web and social media.

The WASHplus KM portfolio continued the legacy of USAID's contribution to global learning and knowledge sharing in three ways. First, through the curation and dissemination of the most current environmental health research and technical resources via over **200** weeklies and **20** quarterly newsletters. These resources have been widely disseminated using a range of electronic and social media platforms that have informed the WASH and clean cooking sectors. Second, the robust mailing list and social media following has helped raise the visibility of USAID and its work in both sectors. These mailing lists have been transitioned to USAID and will not be lost. Third, working with technical experts, WASHplus produced a significant collection of resources, tools, guidelines, field stories, posters, visuals, job aids, learning briefs, and country profiles that tell the story of WASHplus implementation, expand the knowledge base beyond the WASH and clean cooking sectors, and capture lessons learned.

WASH-related global awareness days were not only celebrated but presented opportunities to publicize WASHplus country-level and global contributions and disseminate relevant studies, experiences, and learning. Blogs, stories from the field, posters, and visuals were tied into the awareness day themes and the WASHplus social media platforms ensured that audiences were reached. WASHplus also hosted and supported numerous webinars as well as Google hangouts, creating innovative ways for people to share information or learn about WASH issues.

Improvements in the WASHplus website were made based on experience and user feedback; for example, a language function was recently added that translates the website into more than 60 different languages from Afrikaans to Zulu. The home page was revamped, and a new search function on the resources page enhances users' ability to search and find WASHplus resources.

The project's LinkedIn Clean Cookstove Community provided a forum where more than 100 members could share information on cookstoves. The six technical blogs that WASHplus hosted (household air pollution, urban health, household drinking quality, WASH and nutrition, innovation, and sanitation) were regularly updated and served the WASH and clean cooking sectors by providing news, information, and resources in those technical areas. The WASHplus blog featured 140 posts over the six years, the website attracted _8,500 viewers, the project hosted 15 webinars (see Annex 2 for a full list), and more than 2,000 subscribers followed WASHplus through Twitter.



A snapshot of Twitter analytics over a three-year period.

In addition WASHplus supported the KM efforts of field staff—from preparing end-of-project materials, reports, and graphics; designing posters for conferences; disseminating stories originated in the field to a broader audience; featuring country project directors in blogs and outside publications (journals and websites); and providing hands-on assistance to strengthen KM efforts for Zambia's SPLASH project. WASHplus developed close working relationships with the field staff, anticipating their needs and sharing learning across country programs, identifying stories on subjects of global interest/significance to share and the best way to preserve and amplify the legacy of an activity, such as developing the video on FSM or infographics on Mali's Recipe for a Healthy Child, Making a SPLASH at Scale in Zambia, and WASHplus Innovations.

COUNTRY PROFILES

Bangladesh

What We Did

WASHplus's comprehensive four-year project in southwestern Bangladesh increased access to sustainable safe WASH solutions in marginal and geographically challenging districts; built community and local government capacity to operate and maintain water and sanitation facilities; and strengthened coordinated WASH-nutrition programming. The project applied the SDA approach to develop tools for integrating WASH into nutrition programs, specifically focusing on handwashing before cooking and feeding, and a set of Essential WASH Actions to integrate into the age-specific Essential Nutrition Actions.

WASHplus provided training to sanitation entrepreneurs in Bangladesh on financing and marketing to improve the market for sanitation products.

As part of WASHplus's integration efforts, more than 5,000 nutrition outreach workers were trained by USAID SHIKHA project program officers on behavior-centered approaches to integrate WASH improvement into nutrition outreach. WASHplus collaboratively developed three key job aids to support behavior-centered programming and integration activities, which were disseminated to SHIKHA outreach workers and other interested organizations/projects.

In addition WASHplus trained local sanitation entrepreneurs to offer products and financing for improving and replacing latrines, encouraging coordination with demand-creation activities for improvement or replacement of existing latrines. Working through WaterAid and local NGOs in five subdistricts, the challenging environment of the southwest required WASHplus to innovate and collaborate with partners from the private, government, and civil society sectors to work toward a feces-free environment.

Lastly, using Sanitation Innovation Funds, WASHplus identified age-specific actions for safe disposal of child feces, and also explored the effectiveness of sand envelopment around latrine pits as a mitigation measure for reducing groundwater contamination. WASHplus also funded ICDDR,B to explore the efficacy of a sand envelope around latrines to mitigate fecal contamination through leaching into the environment; addressing sanitation challenges in the tidal and flood-prone terrain of Southwest Bangladesh.

Why It Matters

- Water and sanitation access increased in hard-to reach areas of Bangladesh. New and best practice approaches facilitated these increases and contributed to sustaining WASH improvements: behavior-centered programming, adaptation of CLTS post-triggering action to focus on improving low quality, existing latrines, SDAs focusing on feasible rather than ideal improvements, community and local government accountability and engagement.

- The project featured one of the first-ever strategies for safe disposal of infant and child feces, applying the small doable action approach to specific age groups.

- WASH and nutrition activities were both co-located and integrated programmatically.

- Innovation occurred on many fronts: sanitation innovation (sand envelopment, infant poo, sanitation options for challenging terrains, modifying CLTS for high coverage settings), and water technology innovation (pond sand filtration and rainwater catchment systems).

Key Results

- Water point and latrine construction provided 157,838 individuals with access to sanitation (179 percent of target) and 94,471 individuals with improved access to drinking water (143 percent of target) in five *upazilas* (districts) in southwestern Bangladesh.

- A total of 710 new tubewells were installed, including 40 tubewells over target which were installed by local stakeholders as a result of project mobilization activities. WASHplus constructed an additional 17 pond sand filters and 19 rainwater harvesting systems at the request of USAID to include innovative water technologies. For each water point, a local WASH fund was established, using community-generated income, to ensure continued use and maintenance of the facilities.

- WASHplus certified 685 communities open defecation free, which is 134% of the target.

- Best practice approaches and job aids were disseminated and readily accessible for on-going WASH/nutrition integration work beyond the life of WASHplus.

- Sand barriers were found to be effective in reducing pathogen leaching and shallow aquifer contamination in short duration. However, researchers recommend further research to establish the long-term effectiveness of sand barrier prior scaling up.

Benin

What We Did

WASHplus implemented a pilot hygiene improvement program to reduce household vulnerability to diarrhea and cholera and support government agencies responsible for urban WASH to improve health and quality of life in two of Cotonou's most neglected peri-urban neighborhoods, Agbato and Enagnon. WASHplus carried out a comprehensive baseline of WASH conditions in the greater urban area of Cotonou, Abomey Calavi, and Porto Novo, which served as a model and working document for the Government of Benin. The pilot program emphasized handwashing with soap and safe household drinking water. Poor access to sanitation was addressed through an experimental CLTS effort adapted to peri-urban conditions. The activities were geared toward reducing diarrhea morbidity of children under 5 living in these peri-urban zones.

Community outreach workers (relais communautaires*) from implementing partner ABMS/PSI learn how to make a tippy tap for handwashing at a WASHplus training in Enagnon.*

Community outreach workers from implementing partner Populations Services International (PSI)/ABMS carried out over 7,600 home visits to the 1,700 target households, reaching nearly 10,000 mothers or caretakers of children under 5, to conduct face to-face communication and demonstrations on installing and using locally made handwashing devices, treating household drinking water, and using toilets. Hygiene sessions for women's groups and for mothers and caretakers at health center vaccination sessions, mobile video showings, and radio call-in shows complemented household visits and reinforced the messages. School-based activities included training teachers to make tippy taps and keep drinking water safe in school, and on creating WASH-Friendly schools. WASHplus also supported the rehabilitation of school latrines.

Why It Matters

- The activity shone a spotlight on WASH issues in neglected densely populated slum areas where no development program had previously intervened.
- The baseline of peri-urban WASH was a first ever, and was used by the Ministry of Health Hygiene and Sanitation Service to expand its data collection.
- WASHplus pilot experiences and lessons, including the experimental peri-urban CLTS, will be included in the development of a national Urban WASH Strategy.

- No cases of cholera were reported in the two intervention neighborhoods in 2014 and 2015.

Key Results

- Intervention households did better than comparable control households: setting up fixed handwashing stations and keeping them functional, treating drinking water almost exclusively via chlorination, and adhering more closely to WHOstandards for detected residual chlorine levels.

- 1,762 handwashing stations were installed in homes and institutions.

Burkina Faso

What We Did

In 2013, WASHplus began to explore the links between WASH and NTDs, focusing on trachoma, schistosomiasis, and soil-transmitted helminths. Following a literature review and country assessment, Burkina Faso was selected for a pilot integrated WASH-NTD program. WASHplus began working on its pilot in Gnagna Province in eastern Burkina Faso, a USAID focus area, in 2014, collaborating with the NTD unit at the Ministry of Health. WASHplus worked at the local district level with an integrated team that included the ministries of Health; Education; and Water, Agriculture and Food Security. WASHplus collected baseline data; developed hygiene behavior change counseling cards using existing materials where possible and adding new practices related to NTDs; and hired a local organization to implement the pilot intervention.

Although mass drug administration is key to reducing NTDs, reinfection will remain a problem if WASH behaviors are not addressed.

The intervention included a CLTS component as well as behavior change related to WASH and NTDs. As part of a larger radio campaign implemented in the region, WASHplus emphasized the following messages: always use a latrine for urination and defecation and wash hands before eating/touching food and after defecation. WASHplus developed a toolkit to guide other organizations/programs interested in integrating WASH into their eradication efforts. More information on how to integrate WASH and NTD programs is available in a slide deck companion piece to the integration learning brief.

Why It Matters

- This is one of very few integrated WASH-NTD programs globally. WASHplus documented its program model that can be shared within Burkina Faso and with other interested countries as well as stakeholders interested in WASH-NTD integration.

Key Results

- In each of the 12 target villages in Manni district, WASHplus trained nine community workers to assist in helping to improve WASH behaviors. Communities sensitized other members so a total of 1,643 members were trained in WASH-NTD integration. The political entities at the commune level were fully engaged.

- WASHplus collaboration with the range of partners working in WASH and NTDs in the target province inspired the government stakeholders to coordinate efforts at both the provincial and health district levels to reduce duplication of efforts and ensure coverage across the district.

- The Ministry of Health in Burkina Faso recognized that WASH is critical to reaching the elimination and eradication goals for many NTDs. In a new grant for NTDs, the ministry is planning to propose a WASH component to ensure that WASH activities are scaled up in the country.

Kenya

What We Did

Initially WASHplus worked with the Kenyan government to integrate improved WASH practices into HIV policies and programs. WASHplus developed a training toolkit for WASH-HIV integration endorsed by the Ministry of Health and trained government and implementing partners who then cascaded the training down to the community level across the country. The materials were adapted and integrated into Kenya's community health worker training curriculum. WASHplus also suggested ways to include WASH and inclusive sanitation into various policies. Later the project added a

A WASHplus-trained volunteer devised a system to guide Danson, a young blind man, from his house to his toilet using a nylon string. The WASHplus program in Kenya worked on expanding accessibility to sanitation using locally available materials.

component to help the government advance sanitation uptake by generating demand for sanitation; this included introducing simple supportive technologies to vulnerable households and focusing on equity and inclusion—actions that became incorporated into the government's CLTS strategy.

Working with the Ministry of Health and USAID-funded health projects, WASHplus's rural sanitation pilot program increased sanitation uptake through the government-led CLTS program. Triggering and increasing awareness of the need for sanitation facilities through WASHplus's CLTS+ approach spurred the uptake of improved sanitation at the outset. The project, with other partners, developed a booklet of latrine options, including latrine pits, slabs, and superstructures appropriate to local conditions. Vulnerable populations such as children, the elderly, weak, and mobility challenged gained life-changing supportive devices such as commodes, support bars, and guiding ropes—made of locally available materials—in their homes to enable independent latrine use. This end of project report provides more details on the project's efforts to improve sanitation uptake.

Why It Matters

- A review of communities in Rongo subcounty indicated some villages that had participated in WASHplus's programs experienced zero cases of cholera during the January 2015 outbreak. Read more about the story here.

- Government policy documents and guidelines now contain inclusive WASH strategies and many are based on activities that WASHplus introduced.

Key Results

- Open defecation declined significantly in intervention areas—from 34 percent to 11 percent between baseline and endline. The chance of having a latrine was 6.2 times higher in households with members 65 years or older when compared to households with no seniors. Intervention area households in CLTS-triggered villages were 4.3 times more likely to have a latrine, and households visited by a health educator who discussed sanitation were 9.5 times more likely to have a latrine. No such associations were found in control areas.

- Members of an HIV+ support group were significantly less likely to be open defecators in the intervention area (3 percent) vs. the control area (42 percent).

- An increase in functional handwashing devices was observed in both intervention and control areas. Fixed handwashing devices and observed handwashing near the toilet both increased from 6 percent to 20 percent in the intervention area. Handwashing seems to be moving from yards to toilets or kitchens, however, handwashing is a practice that still needs greater attention.

- Over 8,000 community health workers in charge of at least 400 community units were oriented on integration and inclusive sanitation, and more than 1.6 million Kenyans were reached with inclusive sanitation messages. Trained CLTS+ implementers reached approximately 100 villages in the three pilot sites.

Liberia

What We Did

In 2012, at the request of USAID/Liberia, WASHplus conducted a monthlong mid-term performance review of the I-WASH project, a five-year cooperative agreement (2010-2015) implemented by Cooperative Housing Foundation and subpartner PSI. The assessment identified factors enabling or impeding effective implementation of different project components and advised USAID/Liberia on any needed redirection of strategies or priorities. WASHplus submitted a final report with lessons learned and recommendations for future USAID/Liberia WASH programming.

Why It Matters

The I-WASH project used the feedback from the WASHplus performance review to adjust the program. This project was operational in 2014 when the Ebola epidemic broke out in Liberia. I-WASH observed that communities that were ODF, which could have been a result of the increased social cohesion noted in the evaluation.

Key Results

The review found that the I-WASH project demonstrated CLTS as a viable, strategic approach for achieving sanitation and hygiene impact in small rural villages that have strong social cohesion.

Madagascar

What We Did

Trained workers use the Gulper to extract sludge from a row of pit latrines at an office building in Ambositra as part of WASHplus's pilot project to test fecal sludge removal tools and business models.

To address the lack of sanitation options in densely populated areas of urban Madagascar, WASHplus explored public-private sanitation solutions in several communes. To address a gap in environmentally sound waste management practices, WASHplus engaged the NGO PRACTICA Foundation to design and pilot a private-sector service delivery model to manage fecal sludge generated in the city sustainably using low-cost decentralized technologies. Working closely with the commune authorities, the project selected and trained local entrepreneurs, developed a sludge disposal site, experimented with a range of manual extraction methods and tools, and engaged in a social marketing campaign to promote the service. WASHplus also provided assistance to construct or rehabilitate fee-for-use public sanitation WASH blocks and water kiosks with resource partner Water and Sanitation for the Urban Poor. The WASH blocks provide WASH services for pedestrians in high traffic areas such as bus stations and markets who previously had no hygienic options. Monthly users per facility average about 12,000, so over a year a WASH block will have more than 140,000 users, creating a critical need for fecal sludge management.

Why It Matters

- The pilot successfully demonstrated that demand for an environmentally safe sludge removal and treatment service exists in urban/peri-urban Madagascar.
- The activity introduced innovations in sludge removal tools, transport equipment, and disposal technologies new to Madagascar, thus contributing valuable learning to the emerging global fecal sludge management subsector.

Key Results

- Newly constructed water kiosks improved access to drinking water for 19,419 people. The sale of SanPlat slabs improved access to sanitation facilities for 1,500 people.
- Rehabilitation of two WASH blocks provided access to improved sanitation facilities for approximately 2,100 people living in nearby neighborhoods.
- New businesses have emerged that are engaged in fecal sludge removal in other cities in Madagascar.

Malawi

What We Did

In 2015–2016, at the request of USAID/Malawi, WASHplus initiated technical assistance to complete unfinished environmental compliance activities outstanding from a terminated grant of a local NGO. WASHplus worked with a local agency Water, Waste, Environment Consultants, which contracted with the Central Water Laboratory of the Ministry of Agriculture, Irrigation, and Water Development Water Quality Services Division to complete the activity. The activity included an asset inventory for 32 boreholes as well as latrine blocks in seven schools completed by the USAID grantee; water quality testing of the 31 functional boreholes; facilitation of remedial actions for boreholes with indication of fecal contamination; and report of the assessment findings to the district governments during the official handover of the water and sanitation facilities. These facilities are in the Central Region of Malawi, in Dowa, Kasungu, Lilongwe, Mchinji, Nkhotakota, and Ntchisi districts.

Why It Matters

It is important that project compliance issues are adequately addressed with all USAID projects, and that all facilities of a USAID project have adequate handover to the appropriate governing bodies. This WASHplus technical assistance allowed USAID/Malawi to address compliance issues and hand over the facilities completed in the terminated project to the districts governments.

Key Results

The activity helped USAID meet Environmental Mitigation and Monitoring Plan requirements for a terminated project and hand the terminated project over to district government authorities in an appropriate manner.

Mali

What We Did

WASHplus trained community health workers to screen at-risk children and refer them to commune or district-level rehabilitation centers for food supplements.

Focusing on poor, rural households in Mali's three northern districts (Mopti, Bandiagara, and Bankass), WASHplus worked to improve the nutritional status of children under 2 years old in 180 villages. The project emphasized improving nutrition and hygiene practices through a range of behavior change approaches, including CLTS, and identified and referred undernourished children to community health/nutrition centers for treatment. One hundred forty-six (81 percent of intervention) villages triggered by WASHplus were certified ODF. Within these communities, over 10,000 latrines were constructed, rehabilitated, or upgraded, and more than 15,000 new handwashing stations were added.

WASHplus trained 400 community volunteers and extension workers to negotiate SDAs to improve WASH and nutrition practices at the household level. As an incentive, communities reaching ODF status were eligible to receive a new water point or have an existing one rehabilitated. Villages competed to develop improved tippy tap designs, and many water user groups developed strategies to maintain and repair water points. Activities included CLTS triggering; cooking, breastfeeding, and water treatment demonstrations in the community and at health centers; and household visits promoting exclusive breastfeeding, handwashing with soap, and nutrition counseling and referrals.

Why It Matters

- This integrated activity demonstrated that a planned/implemented WASH and nutrition program can yield results in both sectors.

- Mali's national CLTS policy now incorporates the WASHplus-developed latrine options for different soil and hydrological conditions. The government has advocated the WASHplus practice of training masons prior to CLTS triggering to ensure that demand for latrine construction is met.

Key Results

- Larger gains were made in latrine uptake in intervention compared with control areas. Access to sanitation increased from 47 percent to 94 percent in intervention communities compared to an increase from 42 percent to 73 percent in comparison communities. The gain in access to improved sanitation was 39 points in intervention areas compared to only 15 points in control areas. Access to a latrine resulted in increased disposal of child feces in intervention areas compared with control areas. That is, there was a 61 point gain in hygienic disposal of child feces in intervention areas, compared to only a 25 point gain in control areas.
- In target areas, the number of children referred for moderate malnutrition decreased from 2,050 children over a three-month period in 2014 to 334 over the same period in 2015, and from 269 severely malnourished children with complications to 38.
- Over 40,000 people have improved access to water from newly constructed or rehabilitated water points. Households now understand that many water sources are not safe to drink and have purchased water treatment tablets (over 170,000 tablets during the project).
- The uptake of drinking water chlorination more than doubled in intervention areas, increasing from 19 percent to 44 percent in intervention areas, while it remained static in control areas, hovering around 17 percent both at the baseline and endline.
- Reported diarrhea among children under 2 years of age between baseline and endline in intervention households dropped 7.2 percent (statistically significant) while in control households the drop was 3.5 percent.
- Despite these differences, similar increases were observed in nutritional practices in intervention and control areas, with changes being statistically significant in both. This is true both for exclusive breastfeeding as well as for the adoption of a minimum acceptable diet for children 7–23 months of age.

Uganda

What We Did

WASHplus worked to reduce diarrhea and improve the health and resilience of key populations in three districts of Uganda—Kabale, Kanungu, and Kisoro. This multidisciplinary initiative focused on integrating WASH and food hygiene into nutrition and Feed the Future activities; incorporating WASH and food and menstrual hygiene into community and clinic-based HIV activities; and strengthening the capacity of local districts to plan, budget, implement, and monitor WASH-related activities. As a strategy for sustainability and scale, WASHplus bolstered district government and USAID implementing partner services and programs, rather than implementing its own activities.

Demonstration handwashing stations like this tippy tap at a health center were built to motivate householders to try small doable actions to improve WASH behaviors in Uganda.

The project's legacy includes a WASH budgeting tool for district government as well as a set of job aids (in three languages), among them the first-ever created with SDAs for food hygiene and for rain water catchment; and two capacity-building guides, one for integrating WASH into nutrition and the second for integrating WASH and HIV that were developed based on WASHplus's experience in training and building district and USAID implementing partner capacity.

Why It Matters

- Incorporating new and improved WASH practices makes a difference in the lives of young children, people living with HIV, and other vulnerable households.
- Small doable actions have become a familiar phrase and a new way to motivate behavior change.
- Demonstration latrines, tippy taps, potties for young children, and commodes for people with limited mobility in health centers motivated householders to try WASH improvements. Read the Uganda end of project report for more details.

- Showing girls and boys how to make reusable menstrual hygiene pads, or RUMPs, brought the discussion of menstrual hygiene out in the open, leading to reduced stigma and better menstrual hygiene. Read more about MHM in Uganda in this story.

- Upcoming evaluations of other implementing partner projects should show improved WASH practices (as measured in their surveys), such as increased handwashing with soap. The very nature of integrated programming makes it difficult to attribute outcomes to an individual project.

- Anecdotal evidence and testimony of implementing partners and district government indicate that incorporating new "best practices" into their project work and improved WASH practice is making a difference in the lives of young children, PLHIV, and other vulnerable households.

Zambia

What We Did

WASHplus implemented the SPLASH project, which reached nearly 500 schools in four districts of Zambia's Eastern Province: Chadiza, Chipata, Lundazi, and Mambwe with a comprehensive WASH facility improvement and hygiene education program. SPLASH installed and rehabilitated boreholes, built latrines for students and teachers, installed handwashing stations, and provided drinking water containers near classrooms. Seeking to improve learning outcomes among students, SPLASH's overarching strategy was to work within the Ministry of General Education (MGE) and strengthen the existing system at scale to increase reach and impact. The system included national, provincial, and district government structures; school/community–level systems, and local providers of WASH services and products.

The project trained provincial and district level MGE officials in project planning and budgeting, financial management, and WASH in Schools operations and maintenance of facilities for sustainability. Through the official in-service training system, SPLASH trained teachers in active learning hygiene education in and out of the classroom, focusing on handwashing with soap. Daily group handwashing using multiple tap facilities supported hygiene habit formation among

students, with older ones helping the younger grades. Mindful of the strong link between menstruation and girls school attendance, SPLASH developed a comprehensive MHM component that included building 386 washrooms for girls, promoting local production and stocking of pads at school, and training teachers in puberty education and MHM support, including male teachers, boys, and PTAs.

SPLASH successfully lobbied for WASH themes to be included in the national curriculum, and for WASH/MHM indicators to be added to the provincial school monitoring instrument. SPLASH staff embedded in the district MGE offices successfully advocated for inclusion of WASH activities in MGE strategic plans and budgets. SPLASH measured WASH output indicators throughout the program, but carried out a longitudinal study to measure the impact of WASH on educational performance indicators, particularly student absenteeism. The School Outcome Study compared 60 intervention schools with a full WASH program, including facilities and hygiene education, to 60 comparison schools without such a program, and measured actual and recalled two-week absenteeism over three terms. Other possible confounding factors such as presence of a school feeding program were controlled for in the analysis. The results show a dramatic difference in absenteeism between intervention and control schools: two-week recall absenteeism is about four times higher in schools without WASH than in schools with WASH in the second term and over three times higher in the third term. Notably, the data show no difference in absenteeism reduction among boys and girls. The WASH intervention benefitted all students, regardless of gender.

Why It Matters

- SPLASH demonstrated an at-scale WASH in schools program embedded in the MGE at district and provincial levels. The successful experience and lessons learned are serving as models for other provinces.

- Addressing a taboo such as menstruation in a comprehensive and sensitive way changed community gender norms and the topic became a common and openly discussed concern for schools and families, with lasting benefit for school-going girls. MHM is common now in Eastern Zambia and is a topic gaining national attention.

- Clean classroom drinking water means that students don't leave lessons to search for water and increases pupil-teacher contact time for learning. Students are better hydrated, which helps concentration. Teachers repeatedly appreciated improved attendance to lessons. Read the journal article here.

- Handwashing has become a normal daily activity. Handwashing stations managed by student WASH Clubs ensure water and soap are available on a regular basis.

Key Results

- Over 259,253 people in target areas gained access to improved water supply.

- SPLASH's longitudinal Outcome Study showed a threefold difference in absenteeism rates between intervention schools with and comparison schools without a WASH program, demonstrating that WASH is an undisputed key element of quality education.

- Providing attractive school sanitation facilities and access to water can have an uplifting effect on entire communities. WASHplus estimates that over 9,000 SPLASH-inspired household toilets were constructed in school catchment areas. PTAs made bricks with newly available water and built classrooms, teachers' houses, washrooms for girls, and more, without project funding. WASHplus commissioned this report on the spillover effect.

- Through SPLASH's advocacy, WASH themes are now included in the national curriculum, and the national School Health and Nutrition policy has been updated and submitted to UNESCO for inclusion in updated MGE policies.

- SPLASH provided technical assistance to the District Education Board teams and D-WASHE Committees on planning and budgeting for school WASH, resulting in inclusion of school WASH infrastructure improvement into district strategic plans and budgets.

Bangladesh Clean Cooking

What We Did

The clean cooking stage was at a unique phase when WASHplus entered the scene in 2012. After decades of dedication to one unexceptional locally produced improved mud cookstove, a unique convergence of government and development partners joined forces to work to establish a cookstove market, strengthen the government's ability to enforce standards and regulate, and develop finance options and incentives to build sustainable supply chains and generate demand. In this environment, WASHplus received field support from USAID/Bangladesh to work closely with the CCEB program and GACC to conduct a comprehensive assessment to better understand consumer needs and preferences as they relate to increasing the uptake of improved cookstoves in Bangladesh, including household trials of improved stoves, two different willingness to pay methods, stove use monitoring using temperature-sensing data loggers to track actual stove use, and kitchen performance testing to

Women at a market demonstration examine different styles of improved cookstoves as part of WASHplus's research on consumer preference.

assess resulting changes in household fuel use, as well as indoor air pollution in a subset of homes.

WASHplus shared consumer feedback with manufacturers of each of the study stoves, and gave them the opportunity to modify the stoves accordingly; most did so, and the revised versions were well-received. These revised versions were also tested for efficiency through controlled cooking tests conducted in-country. In addition, WASHplus supported GACC in developing a marketing and behavior change strategy for Bangladesh, including evidence-based approaches to increase the uptake of stoves. This drew on lessons learned in Bangladesh and other countries in the South Asia region in behavior change, demand creation, and marketing of WASH products and cookstoves.

Why It Matters

- Given lack-luster interest in the stoves, and very low willingness to pay for them, researchers recommended that stove promotion activities in-country not focus on the kinds of higher-end imported stoves included in the study; the USAID CCEB program was able to avoid wasted programming costs and instead focused on improving locally produced ICS.

- Greenway Appliances developed the JumboStove based on WASHplus consumer requests for a larger version of the SmartStove; the company hadn't previously considered developing a larger stove. Neha Juneja, CEO of Greenway, thanked WASHplus for the impetus to develop the JumboStove, which is selling very well in India and was well liked in a WASHplus Nepal study.

- As in Nepal, in-country and global stakeholders learned the strategic lessons that flow from accompanying the process of mixed-method market research, and its critical role in developing a marketing strategy organized around the "4Ps"—product, price, place, promotion. Key stakeholders learned the fundamentals of the marketing mix and human-centered design: Based on consumer input, the product might need to be changed to fit people's needs and wants instead of finding ways to promote the "perfectly engineered" product to target consumers.

Nepal Clean Cooking

What We Did

To help inform clean cookstove promotion in Nepal, where the government launched an ambitious Clean Cooking Solutions for All by 2017 initiative to combat high levels of household air pollution, WASHplus conducted a consumer research study, including household trials of improved stoves. Five different improved cookstove models were placed in 140 households for cooks to use and give feedback through semi-structured elicitation questions over the course of four months. The study also included market demonstrations, focus group discussions, and willingness-to-pay assessments. The study further included monitoring activities to evaluate stove performance and impact on the household: controlled cooking tests, kitchen performance tests, and stove usage monitoring.

The controlled cooking test results showed significant fuel savings over the traditional stove for all study stoves; the data were also submitted to GACC for use in its clean cooking catalog. Stove use monitoring and kitchen performance testing data demonstrated that households used the stoves consistently (but not exclusively) during the spring/summer months and accrued significant fuel savings; usage and corresponding benefits did not exist during the winter months. Willingness to pay results showed that households valued the stoves and were willing to pay for them; in Nawalparasi District participants had the option to purchase the stove at the end of the study and more than half did so. In Dang District participants were given the stove as a gift, then offered a cash buy-out; 58 out of 66 study households chose to keep the stove.

Why It Matters

- WASHplus developed a Cookstove Consumer Preference Toolkit based on the multi-methods research in Bangladesh and Nepal. The toolkit provides guidance on how to undertake consumer preference research on improved cooking technologies through Trials of Improved Practice to support better adoption and consistent use of improved cooking technologies. The toolkit includes methods, techniques and tools, and guidance on how to adapt and use them in a variety of settings.

As part of its cookstove study in Nepal, WASHplus conducted cooking demonstrations of local staples such as Daal and rice to gauge interest in stove models that were also being tested in homes.

- As in Bangladesh, in-country and global stakeholders learned the strategic lessons that flow from accompanying the process of mixed-method market research, and its critical role in developing a marketing strategy. Key stakeholders learned the fundamentals of the marketing mix and human-centered design.

ANNEXES

Publications

These documents can be downloaded at: www.washplus.org/resources

By Country

Bangladesh

Understanding Consumer Preference and Willingness to Pay for Improved Cookstoves in Bangladesh, 2013. This study uses qualitative and quantitative methods to explore consumer perceptions of five of the most promising improved cookstoves potentially available for distribution in Bangladesh.

A brief of the above study is also available: **What Do Cooks Want? What Will They Pay? A Study of Improved Cookstoves in Bangladesh,** 2014.

WASHplus Behavior Change Strategy: Hygiene Promotion Guidelines for Bangladesh, 2013. The WASHplus activity aims to increase the consistent and correct practice of a suite of water, sanitation, and hygiene (WASH) behaviors in order to see related improvements in child growth and overall household resiliency and health.

WASHplus Baseline Assessment of WASH Situation in Southwestern Bangladesh, 2013.

Bangladesh Controlled Cooking Tests (CCTs) of Seven Improved Cookstoves Plus Traditional Stove as Baseline, 2014.

Improving Water, Sanitation, and Hygiene in Southwest Bangladesh: An Overview, 2014. An overview of the three-year WASHplus program, implemented through WaterAid and local NGO partners, to improve WASH in southwestern Bangladesh.

Assessing Water, Sanitation, and Hygiene (WASH) in Southwestern Bangladesh: Project Completion Report April 2012–March 2016, 2016. This report takes a comprehensive look at the recently closed four-year project that aimed to address the underlying causes of inadequate WASH conditions in hard-to-reach areas of southwestern Bangladesh.

Benin

Peace Corps Benin WASH Tools and Training Resources, 2014. French language training materials on household water treatment, community-led total sanitation, and WASH in schools.

What is the USAID/WASHplus Benin Urban Hygiene Improvement Program? 2015. This brief provides an overview of the pilot hygiene improvement program in two of Cotonou's most neglected peri-urban neighborhoods, Agbato and Enagnon. The program focuses primarily on

handwashing with soap and safe household drinking water.

Baseline Survey of Peri-Urban Sanitation and Hygiene in Cotonou, Abomey-Calavi, and Porto-Novo, Benin, 2015. Survey of the WASHplus Basic Hygiene Peri Urban and Health Program In Benin, Cotonou, Abomey, and Porto-Novo. In English and French.

WASHplus Benin Peri-Urban Hygiene Improvement Program: Final Report, 2016. WASHplus focused on improving hygiene practices related to handwashing and treatment of household drinking water in households with children under 5, and derived lessons from the experience on how to include effective hygiene improvement in Maternal and Child Health programming.

Benin Peri-Urban Hygiene Improvement Program: Post-Intervention Study Report, 2016. To assess the performance of the pilot program, WASHplus carried out a post-only study in the pilot neighborhoods and a comparable neighborhood. The study measured handwashing and drinking water indicators.

Kenya

WASHplus Kenya Program: Project Brief, 2013. This brief describes the WASHplus project in Kenya and how it supports the Ministry of Health and its partners to integrate improved WASH practices into HIV policies and activities. The project works closely with communities, encouraging households to identify small doable actions they can take to improve health and prevent diarrhea.

Monitoring and Evaluation of the Jiko Poa Cookstove in Kenya, 2013. This study looked at performance assessment for the Jiko Poa in Kenyan homes by analyzing its effects on household air pollution and fuel use and collecting data on how the households valued and used it.

WASHplus in Kenya Baseline Findings, 2014. This report presents the findings of a baseline survey that WASHplus conducted in 2013 in households with targeted vulnerable populations in three strata: peri-urban, rural, and semi-nomadic. A total of 3,211 households meeting specific eligibility criteria were visited in Kenya.

Integrating WASH into HIV Interventions and Advancing Improved Sanitation Uptake: WASHplus Kenya End of Project Report, 2014. What started as an activity to integrate sanitation and hygiene practices into HIV/AIDS care and support programs has grown over the years into a holistic approach to prevent diarrhea among households at risk. WASHplus helped communities and households in Kenya make the connection between improved sanitation, healthy hygiene habits, and positive outcomes for people living with HIV and AIDS, their families, children, the elderly, and other vulnerable households.

Kenya Comparative Analysis, 2016. Intervention and comparison households in Kenya were surveyed to determine drinking water treatment and storage practices, handwashing, management of feces, sanitation facility condition and use, and menstrual hygiene management.

Madagascar

Expanding Coverage and Promoting Sustainability of WASH Infrastructure and Hygiene Investments in Madagascar: Program brief, 2013. Discusses how the WASHplus/WSUP partnership in Madagascar increased access to safe water and sanitation services in ways that promoted environmental awareness, generated employment and income for communities, changed behavior, and built local management capacity.

Manuel de Formation Technique: Vidange Hygienique a Faible Cout, 2013. Sludge Removal Training Guide developed by Practica for WASHplus-supported fecal-sludge management pilot activity in Madagascar. (*Only available in French.)*

Summary Report: Field Review of WASH Approaches, 2012. Success factors and lessons learned from USAID-supported WASH activities in Madagascar.

Review of WASH Approaches in Madagascar - Data Collection Tools, 2012.

Low Cost Systems for the Management of Sludge from Toilets and Shower Units: Current Techniques and Improved Options in Ambositra and Mahanoro. Practica/WASHplus, 2011. *Also available in French.*

Downstream of the Toilet: Transforming Poo into Profit: Briefing Note, 2013. WASHplus engaged the NGO Practica to design and pilot a private-sector service delivery model to sustainably manage fecal sludge generated in Madagascar using low-cost decentralized technologies.

Mali

Mali Baseline, 2015. In French and English

Innovative Strategies for WASH in Mali, 2016. In French. WASHplus developed several innovative strategies to improve sanitation in the Mopti region of Mali. This document details the project's contributions to latrine design, implementing CLTS, and improving sanitation uptake. It includes stories and lessons learned.

Innovative Strategies for Nutrition in Mali, 2016. In French. This document provides a detailed look at the WASHplus WASH and nutrition integration activity in Mali and provides results, lessons learned, challenges/perspectives, and next steps.

Mali End of Project Report, 2016. WASHplus's core activity in Mali revolved around CLTS. The promise of project support for digging or rehabilitating water points was designed as an incentive for communities to become open defecation free. WASHplus also emphasized improving nutrition and hygiene practices through a range of behavior change approaches and identified undernourished children and referred them to community health/nutrition centers for treatment.

What's the Recipe for a Healthy Child in Mali? 2016. Infographic.

Capitalizing on WASHplus Project Achievements: Innovative Sanitation Strategies Implemented by WASHplus in Mali, 2016. WASHplus developed an integrated WASH and nutrition program in the Mopti region to increase the supply of appropriate, affordable, and sustainable WASH solutions, increase demand for low cost sanitation, and improve sanitation and hygiene practices and nutrition. This document focuses on WASHplus's sanitation approach and is available in French and English.

Capitalizing on WASHplus Project Achievements: How WASHplus Effectively Integrated WASH and Nutrition in Mali, 2016. WASHplus worked to integrate WASH and nutrition in Mali because poor hygiene and nutrition behaviors were identified as factors causing malnutrition. Activities included nutrition screening and referral of children and preventing undernutrition through promoting exclusive breastfeeding until the age of 6 months and nutritional and dietary diversification. Available in French and English.

Mali Baseline-Endline Comparisons, 2016. This report presents the major baseline-endline comparisons for a study conducted by the WASHplus project in Mopti Province, Mali.

Uganda

Integrating Safe Water, Sanitation, and Hygiene into Infant and Child Nutrition Programmes: A Training and Resource Pack for Uganda, 2014. The back of this resource pack contains a copy of WASHplus's job aids that were developed to assist village health teams, peer educators, and their supervisors to integrate WASH into ongoing nutrition activities in Uganda. The resource pack is broken into three modules. Module I is designed for health workers. Module I combined with Module II is designed for community-level resources persons. Module III is designed for policy stakeholders and decision makers.

Integrating Safe Water, Sanitation, and Hygiene into HIV Programmes A Training and Resource Pack for Uganda, 2014. It is the intent that this training helps to strengthen key competencies of a range of stakeholders to support and carry out initiatives integrating WASH into HIV and HIV/ nutrition programs at home, community, and clinic levels, with the overall goal of improving the quality of life of people living with HIV and their families.

Small Doable Actions for Improving Household WASH Practices and Assessment Card, 2014. In English and two local languages.

Improving WASH Behaviors to Reduce Diarrhea and Improve the Health and Resilience of Children, Families Affected by HIV/AIDS, and Other Vulnerable Populations: WASHplus Uganda End of Project Review, 2014. With funding from USAID/Uganda WASHplus worked for almost two years (January 2013–November 2014) to reduce diarrhea and improve the health and resilience of key populations in three districts— Kabale, Kisoro, and Kanungu.

Zambia

Zambia Eastern Province WASH in Schools INDABA Whole System in the Room-Strategic Planning Workshop Report, 2012. This Indaba brought together key stakeholders from a range of sectors on board to work towards a common action plan in achieving WASH targets in schools and enhance cross-sector collaboration in Zambia.

Menstrual Hygiene Management in Schools Training Session for School Officials and Teachers. SPLASH, 2014.

Menstrual Hygiene Management Toolkit. SPLASH, 2015. This toolkit was designed to help classroom and guidance teachers, school health and nutrition coordinators, and other school personnel in Zambian primary schools who are carrying out menstrual hygiene management programs or activities in their school.

SPLASH Baseline Survey: School WASH Facility Assessment, 2014

WASH-Friendly Schools: A Training Resource for SPLASH Use, 2014. This guide is intended to be useful to those working for the benefit of children in resource-poor environments who, like children everywhere, have the right to a safe, clean, and welcoming school environment. It is envisioned that this guide will support the creation of an enabling environment to establish WASH-Friendly Schools.

WASH Knowledge, Attitudes, and Practices Survey: Chadiza, Chipata, Lundazi, and Mambwe Districts, Eastern Province. SPLASH, 2014. SPLASH conducted this formative research to determine current levels of hygiene and behavior change knowledge, attitudes, and practices among teachers, pupils, and their families in four districts in Eastern Province, Zambia, and inform the design of in and out-of-classroom hygiene education activities.

Exploring the Potential of Schoolchildren as Change Agents in the Context of School WASH in Rural Zambia, 2014. The findings show that there is strong evidence to support schoolchildren's ability to change their families' WASH knowledge and practice in the context of a school-based WASH intervention. The study showed that pupils utilize techniques like altering their environment, reminding their family regularly, and communicating using their homework to influence change at the home level.

School WASH Facilities Operation and Maintenance Guidelines, 2015. This manual addresses the key O&M tasks necessary to ensure the smooth functioning of school WASH education services and the longevity of related hardware.

A Teacher's Guide to Integrating WASH in School, 2015. This guide supports the teaching and learning about WASH in Zambian primary schools and provides technical content for the teacher to familiarize himself/herself with the subject of WASH, including suggestions on how WASH content can be integrated into the classroom.

SPLASH School Outcome Study: The Effect of WASH in Schools on Educational Outcomes: Absenteeism and Teacher-Pupil Contact Time, 2015. This study clearly establishes that improved WASH conditions and education in school had a positive effect on pupil and teacher absenteeism and teacher-pupil contact time.

Final Report of the SPLASH Project in Zambia, 2016. This final report presents the institutional and technical context within which SPLASH was conceived and executed, and reviews the implementation of each task area, including achievements, lessons learned, and assesses the cross-cutting areas that supported the main interventions.

SPLASH Spillover Effect: Unexpected Construction Resulting from SPLASH Project Interventions, 2016. This report shows how SPLASH's comprehensive approach to WASH in Schools can drive development in areas outside of school WASH.

Menstrual Hygiene Management among Schoolgirls in Eastern Province of Zambia Qualitative Research Final Report, 2016. This study identifies the experiences and challenges schoolgirls faced in hygienically managing menstruation during school hours and explores its effects on school attendance and learning in Zambia's Eastern Province.

Making a SPLASH at Scale in Zambia, 2016. Infographic.

By Topic

Household Air Pollution/Clean Cooking

Market Research in the Clean Cooking Sector: Tools and Tips, 2015. This guide introduces the basic concepts and tools of market research and provides readers with best practices and tips in the design and management of market research in the clean cooking sector. It was created by the Global Alliance for Clean Cookstoves in collaboration with WASHplus as a resource for cookstove and fuel manufacturers, distributors, entrepreneurs, donors, NGOs, and other organizations in the clean cooking sector.

WASHplus Consumer Research Toolkit, 2016. This toolkit provides guidance on how to undertake consumer preference research on improved cooking technologies through Trials of Improved Practices, including guidance in using associated data collection entry and analysis tools.

WASH & Neglected Tropical Diseases Integration

Integrating WASH into NTD Programs: A Desk Review, 2013. This desk review found that the international community recognizes that drug administration alone is insufficient to break the cycle of disease transmission. The current renewed interest in securing WASH to any global NTD control or elimination strategy and adding WASH interventions to NTD treatment programs is essential to achieving sustained control and elimination.

Integrating WASH into NTD Programs, Bangladesh Country Assessment, 2013. Examines existing WASH policy and program context in Bangladesh and identifies potential points of

intersection for WASH and soil-transmitted helminths, which, with investment, could improve the potential for reduced worm reinfection.

Integrating WASH into NTD Programs, Burkina Faso Country Assessment, 2014.

WASHing Away Worms and Other Neglected Tropical Diseases, 2015. Although mass drug administration is key to reducing NTDs, reinfection will remain a problem if WASH behaviors are not addressed. WASHplus is documenting the links between WASH and NTDs and exploring ways to integrate WASH into NTD programs.

Burkina Faso Baseline, 2016. In French and English.

WASH & Nutrition Integration

Improving Nutrition Outcomes with Better Water, Sanitation and Hygiene: Practical Solutions for Policy and Programmes, 2015. This document, jointly prepared by WHO, UNICEF, and USAID, summarizes the current evidence on the benefits of WASH for improving nutrition outcomes. It describes how WASH interventions can be integrated into national nutrition policies and programs to add value.

Integrating Water, Sanitation, and Hygiene into Nutrition Programming, 2013.
If mothers and other caregivers used basic hygiene practices and had better access to safe water and adequate sanitation this could greatly reduce under 5 deaths and improve child nutrition. *Also available in French.*

Water, Sanitation and Hygiene: Essential Components for Food Security. Technical Brief, 2013.

Essential WASH Actions: Draft, 2016. Essesntial WASH Actions are practices that contribute significantly to disease reduction and improved health outcomes. This proposed draft covers safe feces handling and disposal, optimal handwashing, and treatment and safe storage of drinking water.

WASH & HIV/AIDS

Water, Sanitation and Hygiene (WASH) Considerations for Accelerated PMTCT Programming, 2012.
Simple WASH recommendations to incorporate into Prevention of Maternal to Child Transmission programs to improve the quality and effectiveness of these interventions by reducing diarrheal diseases.

Integrating Sanitation into Services for People Living with HIV/AIDS, 2012. C-Change/WASHplus. WASH activities can be integrated into PEPFAR integration frameworks and other activities for PLHIV. This document provides tools and guidelines as well examples of successful country program integration.

Behavior Change

The Science of Habit: Creating Disruptive and Sticky Behavior Change in Handwashing Behavior, 2015. Handwashing with soap is a highly effective method for reducing the risk of diarrheal disease, yet interventions to alter this behavior often fail or achieve only short-term success. This paper proposes that the science of habit can partly explain the challenge of handwashing behavior change.

Sanitation and Innovation

Developing and Testing Innovative WASH Approaches in Ethiopia: Final Report, 2016. With support from WASHplus and the Vitol Foundation, iDE implemented a project to scale-up rural sanitation marketing in rural areas of four regions of Ethiopia to build on the success of its UNICEF-funded pilot.

Laying the Groundwork to Scale Up Sanitation Marketing in Ethiopia: A Learning Brief, 2016. Summarizes the results and findings from the more detailed report above.

Learning Briefs

CLTS-Plus: Value-Added Sanitation Programming, 2015. This Learning Brief describes the different components WASHplus uses when implementing CLTS activities and illustrates how and why they have been applied to CLTS in various country programs.

Small Doable Actions: A Feasible Approach to Behavior Change, 2015. Small doable actions are behaviors that are deemed feasible to perform in resource-constrained settings, from the householder point of view, and effective at personal and public health levels. This brief describes how WASHplus incorporates a small doable action approach to change WASH and household air pollution practices in its global- and country-level activities.

Integrating WASH and Nutrition Learning Brief, 2015. Since 2010, the WASHplus project has been engaged both at the global and country levels in stimulating the discussion and improving the evidence base around integrating WASH into nutrition programming, sharing experiences and approaches to integrating the two sectors. This Learning Brief describes WASHplus country activities in Bangladesh, Mali, and Uganda; global knowledge sharing efforts; and other WASHplus activities.

Good Governance: A Core Component of WASH Project Implementation, 2016. This brief describes how WASHplus supported district governments to improve basic service delivery, strengthen community-level institutions, advocate for pro-poor policy reforms, and enhance collaborations in its country programs.

Behavior-Centered Approaches to Improve Health Outcomes, 2016. This technical brief presents the WASHplus approach to behavior change applied in various country settings to improve WASH practices and serve as the foundation of the project's global guidance.

The Power of Integration to Multiply Development Impact, 2016. Under the WASHplus project integration was a strategic approach to attain desired health and development outcomes and combined WASH with nutrition, education, HIV, and neglected tropical diseases programs. The brief features accompanying slide decks focusing on sector-specific integration programming.

Partnerships: A Key Strategy to Increase Impact and Results, 2016. WASHplus supports USAID's commitment to strategic and creative partnering in WASH and clean cooking to improve sector cooperation, harmonization, collaboration, and effectiveness. This brief reflects on WASHplus's varied experiences creating and maintaining partnerships and consolidates our lessons learned.

WASHplus Country Snapshots and Results, 2016. This document provides a summary of country interventions and a snapshot of results as of 2015. Each WASHplus intervention is tailored to address the unique needs of a given country—whether it be improving school WASH, enhancing household sanitation options, or marketing improved cookstoves.

Journal Articles

The Usefulness of a Handwashing Proxy in Large Household Surveys, 2015. *Journal of Water Sanitation and Hygiene for Development.* Handwashing with soap is a cost-effective way of reducing diarrheal disease mortality in children under 5. Using data from the Multiple Indicators Cluster Survey and the Demographic Health Survey from five countries, WASHplus conducted multivariate analyses to explore an association between the presence of functional handwashing stations (together with needed supplies) and the likelihood of lower reports of child diarrheal disease.

Understanding Consumer Preference and Willingness to Pay for Improved Cookstoves in Bangladesh, 2015. *Journal of Health Communication*. The WASHplus project conducted a comprehensive assessment to understand consumer needs and preferences as they relate to increasing the uptake and consistent, exclusive, and correct use of improved cookstoves in Bangladesh.

Effects of Water Provision and Hydration on Cognitive Function among Primary-School Pupils in Zambia: A Randomized Trial, 2016**.** *PLOS One***.** This study investigated the impact of water provision on cognitive performance among schoolchildren in the hot and arid low-resource schools in Zambia's Eastern Province.

Webinars

WASHplus Clean Cooking: What We Did, Why It Matters, 2016

WASH in Schools Webinar, 2016

Washing Away Diseases Two Hands at a Time, 2016

Hygiene Habit Formation through WASH in Schools in Zambia, 2015 (Rotary WASH e-Summit)

Multisectoral Approaches to Improve Child Growth through WASH, Nutrition and Early Childhood Development, 2015

Handwashing and Global Food Hygiene: A World Health Day Webinar, 2015 (PPPHW)

Integrated Cooking Methods, 2015

David Neal: Handwashing and the Science of Habit, 2014

WASHplus and WSUP: The Power of Creative Thinking: Working Within and Around Challenging Institutional Frameworks, 2014

WASH, Nutrition and Early Childhood Development: New Evidence in ECD and Findings from the Field, 2014

TRAction/WASHplus Webinar: Behavior Change Approaches on the Use of Clean Stoves and Fuels, 2014

USAID-Rotary International H20 Alliance Webinar on the WASH Sustainability Index Tool, 2013

USAID Webinar on Environmental Enteropathy (EE) and WASH, 2013

Behavior Change in WASH Programs, 2013

Inclusive WASH: HIV and AIDS, 2012

Lessons Learned on Working at Scale in Ethiopia and Madagascar, 2011

Household Water Treatment and Safe Storage Indicators, 2011 (International Network to Promote Household Water Treatment and Safe Storage

Conferences

American Society of Tropical Medicine and Health conference
Colorado State University Cookstove Summit
Colorado WASH Symposium 2013
Engineers in Technical and Humanitarian Opportunities of Service (ETHOS) 2011-2016
European Roundtable on WASH and NTDs
Future of Global Health
GACC's Measuring Social Impacts meeting
Global Alliance for Clean Cookstoves Partners' Meeting
Global Health Council Young Professionals Forum
Inaugural meeting of ISO Technical Committee 285 on Clean Cookstoves and Clean Cooking Solutions
Integrating WASH and Freshwater Conservation
Interaction Annual Forum
International Coalition on Trachoma Control meeting
IRC Symposium on Monitoring Sustainability of WASH Services
JMP Post-2105 Global Monitoring Hygiene Working Group at the Singapore International Week
Latinosan 2013
M&E Symposium in West Africa
Menstrual Hygiene Day events 2014-2015
National Institutes of Health Indoor Air Pollution Conference
NTD-NGDO Network annual meeting
Project WET Sustaining the Blue Planet
2nd, 3rd and 4th Annual Virtual MHM Conference
MHM in Ten Global Strategy Meeting 2014-2015
STH-SCHISTO meeting
Stockholm World Water Week
UNC Water and Health 2014-2015
UNC Water Conference
USAID Mini-University 2015
WASH in Schools Global Partnership Meeting
WASH Sustainability Forum
WASH Sustainability Forum
Water and Sanitation Rotarian Action Group World Water Summit 2015
WEDC International conferences 2013-2015
World Water Day DC Coalition
Yale University-sponsored Workshop on the Adoption Gap CORE Group's Global Health Practitioner Conference