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Name of Regional Director: Dr. Lakhdar Boukerrou
Address: 01 BP 1241, Ouagadougou 01, Burkina Faso
Tel: +226-25-37-52-08/+226-25-37-53-08
Tel: +33-17-49-20-328/+33-17-49-20-329
Fax: +226-25-37-52-09
Email: lboukerr@fiu.edu
Website: <http://wawash.fiu.edu>

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Acronyms and Abbreviation

3R	Retention, Recharge, Reuse
ALP	Adaptation Learning Program
BDS	Business Development Services
CBA	Community Based Adaptation
CLTS	Community Led Total Sanitation
CNSS	Caisse Nationale de Sécurité Sociale
CVCA	Climate Vulnerability and Capacity Analysis
DGM	Direction Générale de la Météo
DGRE	Direction Générale des Ressources en Eau
DREAHA	Direction Régionale de l'Eau, des Aménagements Hydrauliques et de l'Assainissement
EMMP	Environmental Monitoring and Mitigation Plan
FIU	Florida International University
FY	Fiscal Year
GDA	Global Development Alliance
GIS	Geographical Information Systems
GLOWS	Global Water for Sustainability
GPS	Global Positioning System
IR	Intermediate Result
IRC	International Water and Sanitation Center
KM	Knowledge Management
LONAB	Loterie Nationale Burkinabé
MDG	Millennium Development Goals
MUS	Multiple Use Services
NGO	Non-Governmental Organization
ODF	Open Defecation Free
PoU	Point-of-Use Water Treatment
PROMACO	Programme de Marketing Social et Communication pour la Santé
RAIN	Rainwater Harvesting Implementation Network
RHCC	Rain water Harvesting Capacity Center
ROECCR	USAID Regional Office Environmental and Climate Change Response
TORs	Terms of Reference
UNESCO-IHE	United Nation Educational Scientific and Cultural Organization - Institute for Water Education
USAID	United State Agency for International Development
USAID /W-AFR	United State Agency for International Development / West Africa
VDS	Association Des Volontaires Développement du Sahel
VSLA	Village Savings and Loans Associations
WA WASH	West Africa Water Supply, Sanitation and Hygiene Program
WSA	Water and Sanitation for Africa
Y3	Year 3
Y4	Year 4

Executive summary

The primary goal of the USAID West Africa Water Supply, Sanitation, and Hygiene Program (USAID WA-WASH) is to increase sustainable access to safe water and sanitation and improve hygiene in West Africa. This report summarizes program results from August 2011 to December 2015.

USAID WA-WASH met or exceeded most of its life-of-project targets in water supply. The Program promoted promising water solutions (low cost boreholes, well-boreholes, hand dug wells with concrete rings, rope pumps, treadle pumps, pole pumps, rain water harvesting, sand dams, small scale piped distribution systems, point of use treatment) to provide reliable access to water for drinking and livelihoods. As a result, 376 drinking water points and 127 productive water points were installed or rehabilitated within the three countries to provide access to improved drinking water sources for 65,691 people.

Sanitation activities took place in all three countries with 318 communities triggered for community-led total sanitation (CLTS). Accordingly, 8,192 household latrines constructed within the three countries. Within the three countries, 521 sanitation stakeholders were trained including masons, facilitators, natural leaders, teachers, government officials, and technical services. As a result of these activities, 21 communities were certified open defecation free (ODF) in Niger and 23 communities were certified-ODF in Ghana. Finally, hygiene promotion activities resulted in an increase of the total number of hand washing stations with soap to 5,863 within the three countries.

USAID WA-WASH food security activities concentrated on conservation farming, climate smart agriculture, gardening, moringa production, cassava production, and poultry production. In support of these activities, 5,855 agricultural producers received short-term agricultural sector productivity or food security training in Burkina Faso, Ghana, and Niger. In all three countries, the program promoted adapted production approaches to increase agricultural production, resulting in 2,549 farmers applying best agronomic practices. Furthermore, the Program evaluated various food security activities to gauge their impacts on the target communities. These activities include conservation farming, climate smart agriculture, moringa production; and rainy season onion.

Trainings on climate vulnerability and capacity analysis and community based adaptation tools and frameworks were held by USAID WA-WASH. Climate vulnerability assessments were carried out in 26 communities within the three countries. Accordingly, 26 community based adaptation plans were developed and validated at the community level. This exercise helped participants and community members to design and develop micro-projects on climate change. The program also trained 246 decision-makers within the three countries on the importance to integrate climate risks and adaptation into development strategies. As a result of the climate change related trainings, 5,657 stakeholders have increased capacity to adapt to the impacts of climate variability and change in the target countries.

Major accomplishments were also recorded for capacity building, an important component of the Program's sustainability strategy. Since 2012, over 21,318 stakeholders including masons, hygienists, drillers, pump manufacturers, local NGOs, local authorities, decision-makers, farmers, women's groups, students, faculty members, etc., benefited from capacity building interventions provided by USAID WA-WASH within the three target countries. In addition, a total of 149 students and young professionals from 15 countries and 38 academic institutions interned with the program. These students and young professionals have been able to find employment or a continuing their education after their internship ended. In addition, the program offered

72 one-year scholarships to 60 students in Burkina Faso, Ghana and Niger enrolled in Master's programs related to USAID WA-WASH's thematic areas. Further, USAID WA-WASH trained 22 staff members from Burkina Faso and Ghana water management agencies in Florida on water resources management. Thirty-nine instructors teaching WASH related subject matters at vocational schools in Burkina Faso and Ghana were trained on pedagogy and adult teaching and 11 faculty members from West African universities were trained on the development of WASH modules and curriculum enhancement. USAID WA-WASH also organized a WASH professional development forum for the benefit of 291 students in Burkina Faso and Ghana. Finally, 247 WASH practitioners received training on WASH governance in Burkina Faso and Ghana and 4,354 people, including water related enterprises, masons, hygienists, CLTS facilitators, water management committee members, water and sanitation committee members, local authorities, local NGOs, etc., benefited from trainings in WASH conducted by the Program.

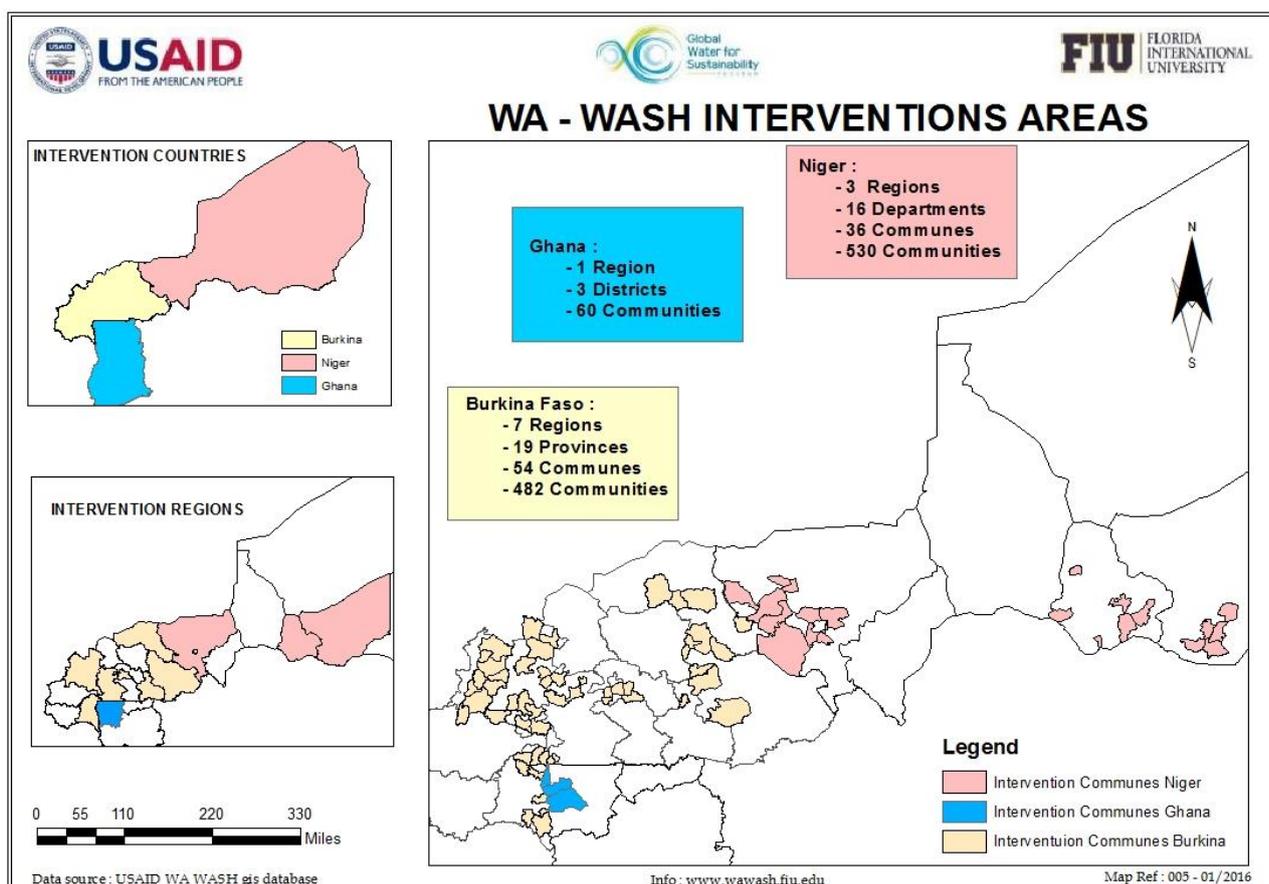
USAID WA-WASH gender mainstreaming and promotion activities resulted in the review of countries' national policies and strategies on gender and WASH policies within West African context and the involvement of women in water point management committees. Further, 492 female leaders from MUS committees, VSLA groups and WATSAN committees, received training on leadership and 80 male gender champions were trained on local gender advocacy in Burkina Faso and Ghana. . The Program's gender advocacy strategy resulted in 569 women gaining access to plots for gardening and most water point management committees having at least 40% of women membership within the three countries. The program also identified 40 male gender champions and established 10 drama groups to support gender related activities in Ghana. USAID WA-WASH supported the establishment of 203 village savings and loan associations and 7,198 people were trained on mainstreaming gender into WASH within the three countries.

Since its inception in 2011, USAID WA-WASH partners have designed and implemented their activities with sustainability in mind. The following approaches have been employed since the beginning of the USAID WA-WASH Program to ensure the sustainability of its activities: access to water and sanitation using low-cost technologies; capacity building across the WASH sector; community ownership; promotion of the private sector; partnership with local NGOs; and buy-in from government. The success of this approach resulted in 50 rope-pumps installed by the trained drilling teams outside the Program's intervention areas in Burkina Faso and 13 in Niger. Notably, the Program has worked with more than 13 local NGOs since its inception, including PROMACO, ANIMAS-SUTURA, NODEF, APDO, DEMI-E, SOS Sahel, AMB Koudougou, OCADES Dedougou, Barka Foundation, Association des Volontaires pour le Développement au Sahel, PRUDA, Water and Sanitation for Africa and ASUDEC. An additional sustainability strategy is to leverage funds from non-US government donors. In total, USAID WA-WASH has received \$5,927,493 in matching or leveraged funds against a USG investment of \$1,621,452.

1. Introduction

This report covers the first Phase of the USAID West Africa Water Supply, Sanitation and Hygiene (USAID WA-WASH) Program's activities implemented in Burkina Faso, Ghana, and Niger (see Map 1) from fiscal year (FY) 2011 to fiscal year 2015, that is, from August 2011 to December 2015. During this period, USAID WA-WASH was implemented by a consortium of 11 primary international and local partners (BPD, CARE, FIU, IRC, IWA, PROMACO, RAIN, UNESCO-IHE, WaterAid, WSA and Winrock) as well as other local partners under the primary implementing partners (APDO, Demi-E, Barka Foundation, AMB, and OCADES.).

All USAID WA-WASH Program activities were implemented under the leadership of Florida International University (FIU) within the context of the Program Result Framework. The present report is divided into ten sections. In the first section, we discuss the administrative and management aspects of the Program. Program activities are presented in the next eight sections, where indicators corresponding to each thematic area are discussed for each of the three countries targeted by the Program. A conclusion is presented in the tenth section.



Map 1: USAID WA-WASH intervention areas in the three target countries (FIU, Burkina Faso 2015)

2. Administration and management

2.1. Regional Program management

The FIU Regional Office administered, coordinated and monitored the USAID WA-WASH Program. With the presence of the US Ambassador to Burkina Faso and representatives from the Government of Burkina Faso, diplomatic missions, local and international NGOs as well as international organizations, the official Program launch ceremony was held on July 16, 2012 at the Regional Office. It marked the official kick-off of USAID WA-WASH activities in West Africa.

On January 29, 2014, the USAID WA-WASH Program budget was reduced from \$28 million to \$20 million. During the following semester, the primary focus of the Regional Office was to adapt the Program to the realigned \$20 million budget. This realignment required modifications to the Program's objectives, activities, partners and staff. The Regional Office revised the Program budget, revised the performance monitoring plan (PMP), reduced the number of partners and Regional Office staff, developed a coordinated sanitation strategy, revised the administrative and technical management plan (ATMP), revised the environmental mitigation and management plan (EMMP) and renegotiated or substantially modified the sub-agreements of six implementing partner organizations. These changes, though difficult, have repositioned the Program to achieve or surpass its objectives within the prescribed performance period.

In addition to Program realignment, a key emphasis of the Regional Office was monitoring of partners' activities. The Regional Office developed a monitoring visit schedule and undertook 28 visits to monitor or participate in partners' activities. Every year, Regional Office staff visited at least three times every partner in each of the three USAID WA-WASH target countries. In addition, the Regional Office held trainings on environmental regulations and monitoring and evaluation (M&E) for all USAID WA-WASH partners. A new online information management system was developed to allow partners to access and share data more easily.

To facilitate collaboration between the diverse implementing partners, the Regional Office hosted semi-annual USAID WA-WASH partners' meetings. The major themes of the meetings were scale-up and sustainability; the group discussed challenges, shared their lessons learned, and examined the role of local organizations.

In Y3, two evaluations of USAID WA-WASH were carried out—an internal sustainability check completed by the French firm HYDROCONSEIL and an external program evaluation commissioned by USAID West Africa and completed by the Ghana Institute of Public Administration (GIMPA). Based on the recommendations of the sustainability check report, the USAID WA-WASH partners developed an action plan to improve the Program's sustainability. The final results of the mid-term evaluation were shared with USAID WA-WASH and an action plan was prepared to address the recommendations but lacked sufficient time to be implemented.

2.2. Public relations and communication

The main objective of USAID WA-WASH Public Relations/Communication Department is to give the visibility to the Program, assure that progress and accomplishments are regularly and effectively communicated and that USAID is given proper credit and recognition.

Throughout the life of the project, the USAID WA-WASH Program produced and/or revised a range of outreach materials for different stakeholders, including press releases, newsletters, and success stories. All USAID WA-

WASH communication materials complied with the approved branding and marking plan. The Program's Public relations products which are available on the website (<http://wawash.fiu.edu>) include:

- **Brochure:** The brochure (in English and French) covers background information, Program objectives and the results and impacts of the USAID WA-WASH Program to date. Over 1,300 physical copies were printed and distributed during the Program's activities (workshops, meetings, official ceremonies, etc.), national and international events.
- **Newsletters:** The quarterly electronic bulletin is published on the website and sent through a distribution list to more than 1,100 stakeholders. Throughout the Phase I performance period, we produced 11 newsletters.
- **Fact Sheets:** The fact sheets provide a technical overview of the thematic areas covered by the Program. They are designed for an informed audience. Throughout the life of the project, nine fact sheets were developed, updated, and 16,400 copies were printed and were distributed during various Program activities. In addition, the fact sheets are also posted on the website.
- **WA-WASH News Flash:** This one-page electronic bulletin highlights events occurring during Program implementation. Throughout Phase 1, we produced and distributed 58 volumes of the USAID WA-WASH News Flash to more than 1,121 people each time. Further, the New Flash is also published on the website.

Finally, the Program continuously updated the different sections of its public website (news and events, publications, photo/video galleries, etc.) to inform visitors about USAID WA-WASH activities and share accomplishments and knowledge with WASH stakeholders. Throughout the life of the project, we recorded an average of 575 visits per month by 1,617 unique visitors from 108 countries, primarily the United States, Burkina Faso, Ghana, France, and Russia.

As a result of the PR efforts, the Program was featured on televisions and received coverage from various news outlets in Burkina Faso, Ghana, Niger, Senegal, Cote d'Ivoire, etc. For example, in two occasions (Senegal and Cote d'Ivoire) the Program was represented in a televised debate on WASH issue with water ministers from West Africa. An updated version of the document summarizing all the published articles and media mentions (from print, TV and Internet) dealing with USAID WA-WASH Program activities ("WA-WASH in the news") is also available on the website with the links to the various articles...

2.3. Environmental Mitigation Measures

Since its inception, USAID WA-WASH implemented environmentally sensitive activities in accordance with the approved environmental mitigation and monitoring plan (EMMP). In order to facilitate the implementation of the EMMP, 13 staff members from USAID WA-WASH implementing partners (FIU, Winrock, WSA, VDS, CARE, ANIMAS SUTURA, PROMACO, and APDO) participated in a workshop on environmental compliance and environmentally sound design and management in Program implementation from February 24 to 25, 2014 in Ouagadougou, Burkina Faso. The training was delivered by representatives from USAID West Africa. The participants gained knowledge and skills to ensure environmentally sound implementation and management of the Program's activities. The main mitigation measures put in place are summarized below.

2.3.1. Direct provision of small-scale water supply

Prior to siting each water point, the Program conducted an assessment of potential pollution sources in the surrounding area and ensured that all water points were installed away from protected areas. The assessments engaged community members to delineate "taboo" areas, areas of open defecation and locations of existing water points. This information was used to site water points in appropriate locations, at least 15 meters from potential pollutant sources (waste dumps, latrines, animal pens, etc.) and not within wetlands or protected areas. Driller teams and other involved stakeholders were then trained on proper construction of the infrastructure and good quality standards as well as safety precautions.

USAID WA-WASH also conducted training for community members on the maintenance of water points within the two countries and formal agreements were made with landlords and traditional authorities in Burkina Faso and Ghana to prevent dispute over the land and the infrastructures installed by the Program. To maintain proper hygiene around water points, USAID WA-WASH constructed platforms to drain excess water into soak away pits. The Program also conducted trainings for community members on this topic. Further, the Program collaborated with the Water Research Institute (WRI) in Accra to perform water quality monitoring on the conventional boreholes installed in Ghana and other laboratories to conduct water analysis for every water point installed by the Program in all three countries.

Per the sustainability check recommendations and water quality assurance plan, USAID WA-WASH also protected (installation of a fence or a small wall) the water points installed in Burkina Faso and Ghana. As of December 31, 2015, 214 water points were protected within the three countries including 134 in Burkina Faso, 60 in Niger, and 20 in Ghana.

2.3.2. Direct Provision of Small-Scale Sanitation Infrastructure in schools and households

As part of USAID WA-WASH's campaign to increase access to improved sanitation, households are advised to site latrines at a distance greater than 15m away from and downstream of existing water points. Households are encouraged to choose toilet locations taking into account the predominant wind direction so that odors from latrines do not pose a public nuisance. Regular monitoring visits were conducted by USAID WA-WASH staff to ensure to implementation of these measures.

With regards to sanitation facilities at schools in Ghana, the siting was done in consultation with the head teachers of the respective schools, community leaders, USAID WA-WASH representatives and the Environmental Health and Sanitation Unit of the District Assemblies. As in the case of siting household latrines,

reasonable distance from water sources and the prevalent wind direction were taken into account in determining the latrine locations. There are no protected lands or forests close to the school compounds.

Within the three countries, 549 trained latrine artisans supported the construction of improved latrines in communities, an approach that has minimized the indiscriminate siting of latrines and increased construction quality in the target communities. The Program continued public education campaigns including radio announcement to promote proper use and maintenance of sanitation facilities. In addition, sensitization on hand-washing continued with the installation of hand-washing stations using “tippy-taps” to encourage hand-washing with soap at critical times.

USAID WA-WASH also trained focal points for WASH in schools and head teachers of beneficiary schools in Ghana on the proper usage, operation, and maintenance requirements of the facilities. They are expected to develop facility maintenance plans (FMPs) for submission to the district office of the Ghana Education Service (GES) and the District Works Department to guide follow-up actions.

2.3.3. Promotion/education of point-of-use water treatment and safe storage

USAID WA-WASH organized community wide and household level demonstrations on the handling and usage of Aquatabs and Crystal Pur filter products in 644 communities in Burkina Faso, Niger, and Ghana. Community sales agents were promoting the products in their respective localities including user education as part of the promotion. Users were taught to read expiry dates of the products and how to safely dispose of expired tablets.

Over eight local wholesale distributors in Burkina Faso, 58 wholesale distributors in Niger, and four local wholesale distributors in Ghana are currently involved in marketing the products within the three countries. Community level vendors and private shops were linked to these distributors to ensure the continuous supply of these products through local markets beyond the life of the project.

2.3.4. Small-scale agriculture and small-scale animal husbandry

With regard to food security activities, USAID WA-WASH promoted soil fertility management through the use of organic fertilizers including compost and natural tree-based fertilizers. Farmers within the three countries were sensitized on the risks of using chemical fertilizers and pesticides. Alternative low cost solutions (plastic mulch, improved seeds, water technologies for irrigation, etc.) were introduced to promote sustainable agricultural practices. For instance, in collaboration with the Ministry of Food and Agriculture (MoFA) in Ghana, 193 vegetable farmers were trained on the operation and maintenance of pumps, water use efficiency, canal irrigation, and agricultural practices. Further, the Program conducted refresher training on animal husbandry for community livestock workers for future replication to the target communities in Ghana. When possible, the Program encouraged communities to separate water points for livestock from water points intended for domestic use. For instance, households were initiated to the “bac” gardening technique which consists of growing vegetable in a plastic container (a bac), with an underlying perforated polythene sheet that minimizes water losses and reduce the competition for water between domestic uses and gardening. Throughout the life-of-the project, care was taken to avoid the conversion of sensitive areas into agricultural land, and all irrigation schemes, other than small systems for small-scale garden plots, were avoided.

3. Water related activities

The Program's achievements related to safe drinking water provision are summarized in Table 1.

Table 1: Water related indicators status as of December 31, 2015

Indicator Number	Indicators	LoP target	Results as of December 31, 2015
IN.02	Number of people gaining access to an improved drinking water source	59,700	65,691
IN.12	Percent of women who correctly use the household water treatment product in the targeted areas of the Program	54%	62%
IN.19	Percent of community level Water Users Associations (WUA) with at least 40% female membership	82%	91%
IN.32	Number of water related enterprises receiving technical training or business development service training	28	29
IN.46	Percent of households using an improved drinking water source	87%	87%
IN.48	Number of households (in target areas) with increased availability of water for multiple uses	5,326	7,621

The following activities were implemented in order to reach the targets stated above.

3.1. Multiple Use Services (MUS) Provision; low cost boreholes; and alternative water supply source development

3.1.1. Burkina Faso

In Burkina Faso, USAID WA-WASH implemented the multiple use of water services (MUS) approach in a total of 28 villages spread across three regions (Centre, Centre-Ouest and Boucle du Mouhoun), including direct implementation in 21 villages and in 7 additional villages through a partnership with two local NGOs AMB and OCADES. The selection process of all these communities was done in collaboration with the regional technical services and local authorities. This process comprises the identification of potential villages for MUS, the shortlisting of the villages identified in collaboration with the local authorities and technical services during a MUS workshop, and the final selection of the MUS intervention villages. As a result, nine initial villages were selected in Y1 for MUS implementation and 12 additional villages were selected in Y3 to extend MUS activities in Burkina Faso.

Prior to MUS implementation in the selected communities, a baseline survey was conducted in the nine initial villages in September 2012 and a second study was conducted in the 12 additional villages in November 2014. Both baselines showed that households rely on different water sources for their domestic needs depending on the seasons (dry versus rainy season). Despite the existence of some improved water points, most households prefer to use the hand-dug wells within their compounds when possible (see Photo 1). Consequently, the main water sources used during the rainy season are unprotected traditional wells (54.5% of the surveyed households), boreholes with hand pumps (37.1%) and unprotected large-diameter wells (11.6%). When most of unimproved water points dry-up during the dry season, the main water sources used are boreholes with hand pumps (57.4%), followed by unprotected traditional wells (39.2%), and unprotected large-diameter wells (11.6%). Within the nine villages, the community water points include 63 traditional wells (51 functional and 12 non-functional), two protected large-diameter wells, and 42 unprotected large-diameter wells.



Photo 1: Traditional wells used for domestic needs in the village of Vipalogo (Winrock, 2012, Burkina Faso)

Based on the baseline survey findings detailing how people were actually using water, USAID WA-WASH decided on a household/self-supply approach rather than a community approach to providing water. The solution adopted include the upgrading of existing private hand-dug wells to well-boreholes and the construction of low-cost boreholes cost-shared with beneficiary households and/or neighboring households. Through this approach, the target communities gained access to improve drinking water sources for their domestic and productive needs and the capacity of local enterprises was built to ensure the sustainability of the water technologies promoted beyond USAID WA-WASH. A low-cost borehole or an upgraded traditional well with a rope pump can serve up to 75 people. These facilities are primarily designed for domestic water needs but they can also be used for small scale productive activities such as small livestock rearing and the production of “dolo” (a local beer). The water, fetched through the low cost water technologies, complies with Burkina Faso’s water quality regulations. Furthermore, USAID WA-WASH rehabilitated non-functional

conventional boreholes to complement the water provision approach within the MUS communities. The rehabilitation of these boreholes also implies a cost-shared with target communities and this process is facilitated by local authorities and water user associations (WUAs).

The domestic water points have an average depth of 20m, obtained by deepening existing wells by 7 to 8m. After drilling, the wells were disinfected (with chlorine), capped, and equipped with a rope pump (see Photo 2). As part of the business development support provided by USAID WA-WASH to ensure the sustainability of the low cost water technologies, the rope pumps were labelled “FASeau pump”. For productive water points, the Program improved existing gardening wells with concrete rings in order to prevent the frequent collapses faced by local producers. Innovative technologies such as hand pumps, bicycle pumps and pole pumps were introduced to facilitate water collection from these wells with an average depth of 25-30m after USAID WA-WASH intervention.



Photo 2: Before and after - the upgraded dug-well in Oueglega (Winrock, Oct. and Dec. 2012, Burkina Faso). Right photo -- Dr. Lakhdar Boukerrou (left), Chief of Party USAID WA-WASH with Robert Buzzard from USAID West Africa. Left photo –The first improved water point installed by USAID WA-WASH.

With water technologies identified for both domestic and productive water uses, USAID WA-WASH worked to establish and strengthen a private sector supply chain, including drillers, pump manufacturers, and local pump installer/repairers, for the construction and promotion of these technologies within the MUS communities. Accordingly, the Program identified and trained eight local drilling enterprises on the construction of low-cost water points, business management, and marketing. Covering the three target regions, the drilling teams were selected based on their previous experience in the construction of traditional wells and their location (ability to reach the target communities). The Program equipped each drilling team with manual digging tools and supported five of these local enterprises toward their formal registration with the tax services in order to get a tax identification number. The drilling teams received a total of four trainings on technologies for developing low-cost boreholes (threshing, simple augers, and manual drilling for clay and laterite). As a result, they operate as regular/formal businesses and they participate in national calls for tender. Furthermore, four pump manufacturers were identified and trained to construct and install rope pump, pole pump and bicycle pump across the target regions. They were trained on business development services and equipped with pump manufacturing tools. In support to this activity, 13 local rope-pump repairers/installers were trained and equipped to facilitate repairs in case of breakdowns.

Private hand-du wells remain the first choice of the target communities despite the risks encountered (contamination due to poor sanitation, frequent collapses during the raining season, and children falling into the wells). In order to address these challenges, USAID WA-WASH introduced water technologies adapted to the local context and all water points were treated and analyzed in accordance with national standards. Water quality analyses revealed a problem of turbidity for some of the low-cost water points, but this issue is generally resolved over time with pumping. When persisting, the Program introduced water filters to overcome the problem of turbidity.

The major constraint encountered when promoting the low-cost water points was the reluctance of the target communities. They raised some concerns regarding the reliability and sustainability of the proposed technologies. In order to address this challenge, the mobilizers conducted sensitization campaigns as a follow-up to the demonstrations done in each community with the trained drillers and pump manufacturers. The sensitization campaigns were supported by community leaders, local authorities, driller teams, and pump manufacturers. In accordance with the Program's water quality assurance plan (WQAP), water quality testing (physico-chemical and microbiological) were done to reassure the beneficiaries about the quality of the water fetched from the low cost water points.

Since its inception, USAID WA-WASH installed 176 low-cost water points and rehabilitated 12 conventional boreholes within the MUS communities, including 20 water points installed by local NGOs partners AMB and OCADES. As a result, 16,589 people gained access to an improved drinking water source.

Success Story: Communities access to potable water through low cost technologies

Goudin Yameogo, a 65-year old man is one of the manual boreholes beneficiaries. He heads his household in Tiogo Mossi, a village on the outskirts of Koudougou, in the Center-West region of Burkina Faso. With his three wives and 32 children, Goudin has experienced what he calls "true fetching of water". The difficult task of fetching water consist of traveling kilometers in search of that precious commodity. This has been part of his daily life since 1960. "The problem of water was the principal challenge that we encountered in the village and that preoccupies me the most as a head of household" said Yameogo when asked about his major concerns during his life in the village.



Yameogo's children, now have access to potable water right in front of their home

Hence the USAID WA-WASH Program was positively welcomed by the rural populations as it addressed important issues facing rural communities such as water scarcity (especially during the dry season), high prevalence of water-borne diseases, conflicts over access to the few functional water points in the village, and the impossibility to practice any livelihood activity requiring significant amounts of water. Since 2014 when USAID WA-WASH helped him with a well-borehole equipped with a rope-pump, he no longer speak about the challenges of fetching water. "This pump is a true relief for my family in general and me in particular," explains Yameogo. Now, he makes use of a well-borehole which provides him with water for domestic use. He also notices that this infrastructure is having an impact on his family members health. "Since I took advantage of this improved water point, no member of my family has suffered from dysentery. The Program brought us health," he said. Six of his children are still attending school. They now have more time to dedicate to their studies since they are no longer spending time fetching water. This has situation ultimately improved their school performance. Yameogo, is also proud to see his three wives and his daughters-in-law relieved from the distance walked to fetch water. "My wives are also relieved because they no longer have to walk long distances to draw water. Now, they only need to take a few steps to have water on hand before starting their chores. They are no longer subject to fetching water," he says enthusiastically. As part of its empowerment strategy, USAID WA-WASH supported Yameogo in setting up a simple and reliable management system to ensure the

Per USAID WA-WASH' sustainability strategy, 134 water points were fenced and water point management committees were established for all water points to ensure proper management and maintenance of the water facilities. Through this activity, the Program increased the percentage of households using an improved drinking water source in the target area by 26 percentage points (see boxed text for a success story). as compared to the baseline (37%).

As part of a partnership with Rotary International to extend MUS activities, USAID WA-WASH strengthened the capacity of three local NGOs (OCADES, AMB, and BARKA Foundation). The Program worked with OCADES and AMB to install low-cost boreholes in their intervention area and a technical assistance was provided to BARKA Foundation to install four conventional boreholes in the Eastern region of Burkina Faso. This capacity building was done through a MUS training and regular onsite support. Furthermore, the Program trained one metal workshop identified by BARKA to manufacture school hand-washing stations as part of hygiene promotion activities. As a result of the support provided to the three local NGOs partners, 21 additional low-cost water points were installed across six communities. This brings to 197 the total number of low-cost drinking water points installed under the MUS activity in Burkina Faso.

Regarding productive water use, 80 low cost water technologies were sold and installed within the MUS communities. These water points included 32 installed by local NGOs partners AMB and OCADES. Since 2012, the implementation of the MUS activity helped 2,673 households to gain access to water for multiple uses in Burkina Faso.

Since its inception, USAID WA-WASH focused on the sustainability of its actions and activities. Per this strategy, the Program strengthened the supply chain for water related products and services in order to foster the involvement of the private sector in providing water services to communities. For this, the Program identified and trained 25 private sector water service providers who make-up the supply chain of low-cost water points while making a profit. These water service suppliers include eight drilling teams, four rope-pump manufacturers, and 13 local pump installers/repairers. The success of this approach resulted in 50 rope-pumps installed by the trained drilling teams outside the Program's intervention areas.

Furthermore, the Program organized a workshop in June 2015 to strengthen and sharpen the capacity of the water related enterprises trained throughout the life of the project. As a result, the drillers and rope-pump manufacturers created an association entitled "association of manual drillers and rope pump manufacturers" ("Association des Foreurs Manuels et Artisans de Pompe à Corde – AFMAPAC"). The association established plans to continue their activities beyond USAID WA-WASH including continuous monitoring of the fabrication and technology installation processes in order to maintain the confidence of existing clients and attract new clients, joint efforts in promoting the low cost water technologies and services in their regions using local radios and exhibit fairs, organizing regular meetings, exchanges visits, and establish a network of low-cost technologies suppliers in Burkina Faso to better monitor and share the market demand in their respective regions.

Before the end of the MUS activity in Burkina Faso, USAID WA-WASH conducted awareness campaigns and focus groups discussions in July 2015 to reflect on the sustainability of the investments made by the Program. In collaboration with water users associations, water point management committees, water users, village development committees, drilling teams, rope pump manufacturers and repairers/installers, the Program supported community members to develop strategies focused on water point protection/fencing, repair existing water points in case of breakdown, and install new water points beyond the Program.

3.1.2. Ghana

USAID WA-WASH launched multiple water services (MUS) activities in Ghana in April 2014. Over the life of the project, the Program conducted two separate baseline studies covering 30 communities in Lawra and Nandom Districts in the Upper West region of Ghana. As part of these studies, the Program explored existing technologies that could be used to increase community access to potable water and to improved hygiene, and sanitation. Based on a set of criteria (hydro-geological conditions for low-cost technologies, community water needs for domestic and productive uses, other USAID WA-WASH partners intervention areas for activity integration, and community willingness to contribute to the activities), 21 communities were selected to implement MUS activities. The baseline study revealed the need and the possibility to install low-cost boreholes in the selected communities. This approach was complemented by the rehabilitation of existing water points. For this, the existing water technologies in the 21 communities were identified and assessed for adoption and/or modification when appropriate.

The community entry process was done by holding meetings with officials of the various District Assemblies, WASH organizations, opinion leaders and community members to discuss the approach and proposed technologies options (i.e. creation or rehabilitation of conventional boreholes, drilling of new low cost boreholes and upgrading of existing traditional wells). Water accounting was carried out in all target communities to evaluate the sources of water against the needs of the people. The Program trained 75 water user association leaders to support the implementation of MUS activities and oversee the management of all installed

Success Story: The success a mother in the Koh Guori is a rural community in the Upper West region of Ghana

Like in other rural communities in this region, women considered gardening as a burden, because they had to go long distance to fetch water for domestic and productive needs. This situation limits considerably the possibility to undertake productive activities, such as gardening, especially for women. To reduce the burden of women in the target communities, USAID WA-WASH through Winrock introduced the BAC gardening technique in two intervention villages of Tantuo and Koh-Gouri in Nandom and Lawra districts respectively. Two women groups from the two villages applied the technique. The BAC gardening technique conserves moisture in the soil and improves soil fertility therefore increasing the yields. Wooden boards are used to create a bed filled with mixture of soil and manure on a perforated black polythene sheet. To better conserve moisture, the farmers are trained on mulching.



Nathasia Boro in her garden in the Koh-Gouri community

Nathasia Boro, a mother of two, is member of the Koh-Gouri women producer group and secretary of the group. She explained that with all the improved gardening techniques they have learned through the USAID WA-WASH Program, the Koh-Gouri group is proud of 325 square meters of garden planted with both local and exotic vegetables, thereby improving households' nutrition and providing additional revenues to the group members. The Koh-Gouri women express their happiness about the good results of the gardening activities. Women are now prepared to expand the gardens as they have money from the sale of the produce. Nathasia Boro said "We thought gardening was a burden because we needed to fetch water for domestic purposes and water plants as well. With the BAC gardening technique training given us, we do not need to water plants more frequently. With this type of gardens, I believe we can easily make them in our houses since we do not need too much land and water". Applying this technique in the group gardening and at the household level enhanced food security and improved the socio-economic status of women in the communities.

water facilities. Furthermore, USAID WA-WASH identified and trained two drilling teams (one from Lawra and one from Nandom) on the low cost drilling, well upgrade techniques and repair to strengthen the local supply chain and provide post-construction support after the Program.

The geology of the intervention area limited options to applying low-cost technologies in the Upper West region of Ghana. In most communities, the hard bedrock also limited manual drilling. This situation created difficulties during community selection and choice of appropriate technology. Furthermore, the target communities were mostly interested in water for domestic uses in a context of acute water shortages while MUS proposes an integrated approach of water for domestic and productive uses. This challenge was overcome by sensitization campaigns conducted to explain the MUS concept.

Despite these constraints, 8,516 people (4,297 men and 4,219 women) gained access to water for domestic and productive uses in the Nandom and Lawra Districts. This was achieved through 21 water points installed/rehabilitated by the Program (see Photo 3 and Photo 4) including six rehabilitated conventional boreholes fitted with hand pumps, five new conventional boreholes equipped with hand pumps, six new low-cost boreholes equipped with rope pumps and four hand-dug wells upgraded, covered and fitted with rope-pumps.



Photo 3: Upgraded hand dug well in Zambo Zopaal (Winrock, Burkina Faso, 2015)



Photo 4: Rehabilitated conventional borehole in Dowine (Winrock, Burkina Faso, 2015)

To prevent future disputes following the end of the USAID WA-WASH Program, the water users association, the village chiefs and landowners in 21 communities reached agreements to guarantee that the water facilities belonged to the community and not to the landowner. Another stipulation of the agreement was that all water points should be fenced to encourage good hygiene, prevent access to livestock, and limit any other potential contamination around the water points.

Furthermore, a relationship has been created between the community, drilling teams and pump manufacturers to ensure that water points are repaired or other services provided as the need arises. Local drillers and pump manufactures have also received reinforcement training in the management of small and medium size businesses so that they can sustain their activity and provide services to the communities beyond USAID WA-WASH.

Sub-Activity: Provision of potable drinking water to communities

USAID WA-WASH directly intervened in four communities in the Lawra district and two communities in the Nandom district of Ghana's Upper West region to increase community members' access to potable water. While four of these communities previously had no safe drinking water sources, the other two had existing facilities that did not adequately address the needs of the entire population as per national guidelines. All six communities benefitted from boreholes fitted with Afridev hand pumps. The communities without access to clean water lacked any sort of water or sanitation committees and those that did have potable water sources had weak management structures whose members were inactive and have received little or no training.

All community members faced challenges. Women were observed to travel long distances even to access unimproved water sources and most communities were dependent on rivers, streams, and dugouts for their water supply. The consequences of the lack of safe water included a high prevalence of water-related diseases, women having insufficient time for productive activities due to the burden of water-fetching, children turning up late for school, and livestock theft due to the long distances animals had to travel in search of water, especially during the dry season.

In line with the National Community Water and Sanitation Program (NCWSP) in Ghana, the Program placed communities in the center of the project cycle: community mobilization, establishment of Water and Sanitation Management Teams (WSMTs), and capacity building. The construction activities included geophysical site selection, borehole drilling, pumping tests, water quality analysis, well pad construction, and hand-pump installation. The Afridev hand-pump installed by the Program is nationally approved with existing supply chains for spare parts and a successful track record of maintenance at the community level.

USAID WA-WASH established six (6) new gender-balanced WSMTs and reorganized 22 existing ones in the beneficiary communities. The total membership was 211 members (118 men and 93 women). All 28 teams received a comprehensive training on the operation and maintenance of water points, group dynamics, hygiene and sanitation promotion, roles and responsibilities of WSMTs, community mobilization, meeting procedures, record keeping, tariff setting, fundraising, and gender issues. The WSMTs are responsible for the management, operation, and maintenance of water facilities on behalf of their communities. Forty-two community members (21 men and 21 women) were also selected as pump caretakers and trained to provide minor maintenance work. The pump caretakers were equipped with basic repair tools. All WSMTs were linked to area mechanics, District Water and Sanitation Teams (DWSTs), and spare part dealers for post-construction operation and maintenance support. A follow-up with the training participants revealed that the communities are making conscious efforts to keep their water systems running. Communities began stockpiling spares of fast wearing parts, keeping borehole surroundings clean and hygienic and increasing the committees' efforts to raise more funds for operation and maintenance of the facilities.

The water from all six newly constructed boreholes were tested for bacteriological and chemical contamination, including arsenic, according to USAID regulations (Reg. 216) before the water points were handed over to communities. Each beneficiary community instituted a payment system allowing water users and households to pay fees to the WSMTs on a regular basis and every WSMT has a 'water account' in local financial institutions. The water fees are used to pay service providers when necessary.

Despite the initial excitement in the six (6) communities, a key challenge that emerged during the implementation of this activity was the raising of funds to support the operation and maintenance of water points due to the users' reluctance to pay. A "water user payment education" activity coupled with the introduction of the village savings and loans associations (VSLAs) helped to boost the efforts of revenue generation by the WSMTs.

Another challenge was the men domination in water management, which limited women involvement in taking key decisions around water use, payment for water, operation, and maintenance of water points. In order to overcome this challenge, USAID WA-WASH's gender mainstreaming and empowerment activities ensured that all WSMTs have at least 40% women representation while also building the leadership capacities of women to effectively participate in team activities.

A total of 1,851 individuals (838 men and 1,013 women) from six (6) communities gained access to potable water as a result of the USAID WA-WASH intervention. All households (167) from the six (6) target communities now access potable drinking water compared to only 48 households at the Program inception. As a result, community members have expressed great delight in the changes at the household and community levels. They mention benefits relating to health, the environment, women's empowerment, livelihoods, and finances.

The Program facilitated the establishment and capacity building of local management structures such as the Water and Sanitation Management Teams (WSMTs) and the pump caretakers to oversee the successful running of the water points. The WSMTs have subsequently instituted tariff regimes to

Success story: USAID WA-WASH strengthens the link between water provision, income generation, and women empowerment

Before the USAID WA-WASH intervention in Ghana, access to potable water in the village of Ketuo-Beyoglu was very poor. The community members relied on an unprotected hand-dug well for their water needs. Even in the rainy season, there was insufficient water in this well for everyone, a situation which led to quarrels and long queues. In the dry season, the well yielded nothing at all. The lack of water was hardest for the women, who during those months were forced to walk long distances to draw from a river. Besides the physical burden of transporting vessels, this situation also put tremendous time pressure on the women to keep up with farm work and household duties. The installation of a borehole by USAID WA-WASH came as an enormous relief for the residents of Ketuo-Beyoglu and other target communities of the Program that likewise received boreholes.



Madam Grace drawing water from the new water point

Grace Gboro is a resident in the community of Ketuo-Beyoglu. Like most women in this area, she manages the water needs of her household, which includes her husband, three children, and a father-in-law. Grace was delighted when the borehole was constructed. She explains, "In March and February, we could not access water from the well, only the dirty water from the Black Volta River. But even during the other months, people were so desperate for water that there was a lot of fighting and unfriendliness. We had to wake up very early to try to beat the queue. I'm sorry to say that I fought with one of my sisters at the borehole and ended up breaking her pot." Grace continues, "Women who were interested in brewing pito used to have to wait seven days or more to collect enough clean water to start brewing. However, there were those who were strong enough and could push the weaker ones down to get enough water. We shared no love for one another and we did a lot of naughty things to one another."

Now, Grace says, women are brewing pito and using water for other purposes with ease. "Today we neither fight over water nor encounter long queues. We can cook food for our husbands in the fields and we have time to complete all our other work. All this has changed because of our new community borehole. We are thankful that we do not need to struggle now for water."

support revenue generation for operation and maintenance of water points.

3.1.3. Niger

From September 2012 to July 2014, USAID WA-WASH implemented the multiple water services (MUS) activities in 68 rural communities of the communes of Gouna, Wacha, Bandé, Guidimouni and Doungass in the Zinder region of Niger. In this arid country, water-related challenges exacerbate poverty in addition to the lack of water infrastructures to face the adverse impacts of climate change. The situation is worst in small communities not representing a priority for the government given their size. In the Zinder region, communities primarily rely on seasonal pond and unimproved hand-dug wells (see Photo 5) and water



Photo 5: Children collecting drinking water from a dirty pond in the village of Bitoa (Winrock, 2012, Niger)

quality represents a major concern due to poor sanitation, high cattle density, and shallow water table. When available, improved water points are frequently abandoned due the lack of a local supply chain for spare parts in case of a breakdown and the non-performance of water point management committees.

The baseline study (water accounting survey) conducted in September 2012 revealed that 59 of the 68 selected communities did not have access to an improved water source and/or water for productive uses. Only nine communities had sufficient drinking water but did not have sufficient water for small scale productive uses, such as gardening and small livestock. During the water accounting survey, households in selected communities were asked about their sources of water for both domestic and productive use. From the study findings, 60% of households surveyed rely on traditional hand dug wells, 37% use cement-lined wells, 30% use boreholes equipped with manual pumps and 6% use ponds. These numbers underline the fact that most of the households use different water sources depending on the season.

USAID WA-WASH's approach focused on community participation in the identification of problems and solutions, and joint decision making about how to fulfill domestic and productive water needs. Accordingly, a water accounting was conducted in the selected MUS villages with the communities' participation to identify existing water uses, water users, water sources, and potential water supply options for meeting needs. Through this approach, communities gained a good understanding of their water needs for both domestic and productive uses and they were more predisposed to adopt the low-cost water technologies proposed by the Program.

Furthermore, USAID WA-WASH through Winrock worked with communities to design locally appropriate solutions for MUS in the target villages in order to facilitate access to water for domestic and productive activities, building on lessons learned from a previous MUS project implemented in the Zinder region of Niger. As a result, the water technologies selected by the Program included manually drilled boreholes equipped with rope pumps, manually drilled gardening wells equipped with treadle pumps, and upgraded traditional wells.

With water technologies identified for both domestic and productive water uses, USAID WA-WASH worked to establish and strengthen a private sector supply chain, including drillers, pump manufacturers, and local pump installer/repairers, for the construction and promotion of these technologies within the MUS communities. In total, 12 local enterprises were trained on technical and business development services including four manual drilling teams, four rope and treadle pump manufacturers, and four masons. In addition, 43 people were trained to install pumps, perform basic repairs, and conduct preventive maintenance.

In support of the local supply chain for low-cost water technologies, USAID WA-WASH equipped the drilling teams and the pump manufacturers to ensure their effectiveness in providing sustainable water services to the target communities and beyond. With these equipment, the trained drilling teams and pump manufacturers conducted cascade trainings, leading to the creation of new water related enterprises in the Zinder region. These enterprises now form a network for the sale, maintenance, and repairs of the low-cost water technologies.

Throughout the life of the project in Niger, USAID WA-WASH established and trained 41 local water point management committees in each community to manage the newly constructed or rehabilitated water points. Over 325 people (200 men and 125 women) were trained on topics including: water points' management and maintenance, hygiene promotion, MUS, and gender mainstreaming. Gender discussions focused on the roles and position of women in the management and maintenance of public assets including water infrastructures and village savings and loans associations (VSLA).

In the domain of water provision, USAID WA-WASH focused on the development of water technologies affordable for the target communities and adapted to the local context. The low cost of the water technologies sometime represent a challenge because they are perceived to have poor quality. Furthermore, the low-cost water points are not taken into account in the national statistics survey about access to water while open cemented-wells are included. In order to overcome these challenges, local authorities, community members, private businesses, local NGOs, and government technical services (water, health and agriculture) were involved in key activities from the Program inception. This participatory approach also intends to increase the awareness of the proposed water solutions benefits and ensure their sustainability beyond USAID WA-WASH.

The promotion of low-cost water technologies resulted in the construction/rehabilitation of 120 water points across 41 communities, including 73 domestic water points (see Photo 6) and 47 productive water points. The domestic water points separated from water points for large livestock or other important productive activities. The domestic water points include 59 community water points equipped with a community rope pump and 14 household water points equipped with a family rope pump or an EMAS pump. The community water points were cost-shared with an 18% contribution by the beneficiaries (around \$180 per water point) while the household water points were moderately subsidized by the program. Three out of the 14 household water points were entirely funded by the beneficiaries. The success of the supply chain developed by the Program resulted in 13 rope pumps installed outside the Program's intervention area in Niger.



Photo 6: A low-cost borehole equipped with a rope pump in the village of Bitoa (Winrock, 2013, Niger)

The productive water points include 32 private water points equipped with a treadle pump or a motorized pump for irrigation fully paid by the beneficiaries, seven (7) subsidized water points equipped with treadle pumps for women's groups practicing gardening, five (5) subsidized water points equipped with treadle pumps for schools gardens, two (2) wells rehabilitated for productive uses, and one (1) subsidized water point equipped with a treadle pump for demonstration in the commune of Wacha.

Based on a survey conducted by the Program in July 2014, approximately 3,135 households have increased availability of water for multiple uses (domestic and productive) and 90.8% of the households in the target communities are using improved drinking water sources. The average distance between households and the water points was estimated at 184m as compared to 334m before USAID WA-WASH interventions. The same survey revealed that the percentage of households whose domestic water needs are fully covered increased from 15.2% before the Program to 86.4% after the Program interventions.

The MUS activities in Niger had direct impacts in term of improved access to clean water and improved health. They also led to other outcomes including an improved community water governance. For instance, the chief of one of the target communities (Barkonogie) noted a "positive community spirit" created by the new water points which led to the creation of weekly cleaning days and an increased willingness to pay for maintenance fees of the water point.

There is tremendous scope for extending MUS in Niger through the development of the private sector network and the transfer

Success Story: Multiple-Use Water Services provides water and spur community-led health improvements

Prior to USAID WA-WASH, the village of Barkonogie's main drinking water source was a contaminated hand-dug shallow well. Residents of this small remote Nigerien village, located 80 km from the regional capital of Zinder, struggled to dig more than 5 meters in sandy soil to reach water without the appropriate equipment or proper training. Despite the general perception that the dugout's water was unclean, the community had no choice but to drink it. The hand-dug well was installed on the lower part of the village and exposed to all kinds of dirt and debris carried by the wind and rainwater runoff. In Barkonogie, water services were improved through the installation of two boreholes equipped with rope pumps coupled with support for water users associations and hygiene training. While the boreholes are used primarily for domestic water, the excess water is used to provide for livestock around the homestead that are watered by women. With just over 300 people (52 households), the village of Barkonogie would have not benefited from government programs, which target densely populated villages.



Haouaou fetching water from one of the newly installed boreholes in Barkonogie, Niger

Haouaou Laouali is a 30-year-old woman, mother of seven and a resident of the village of Barkonogie. She purchased a brand new plastic container immediately after the community had been granted access to the new boreholes. She felt the old container was no longer clean enough for the quality of the water she and her family of 12 were now drinking. Among other benefits, Haouaou likes that the rope pump is easy for her to operate and is just 40 meters from her house. This makes a big difference because she fetches water for her family approximately four to five times a day, mostly early in the morning for bathing, washing, cleaning, cooking and watering their small livestock at homestead. Haouaou's household contributed 1,350 FCFA, or around \$2.7 US dollars, to the initial investment for the boreholes construction. The community as a whole contributed 180,000 FCFA or around \$360 US dollars toward the cost of the construction of two boreholes fitted with rope pumps. The project covered the drilling cost and aprons construction cost, or approximately 350,000 CFA (\$700) per borehole. USAID WA-WASH anticipates that in the future, communities like Barkonogie will invest in rope pumps and boreholes without project assistance.

of knowledge and expertise to local NGOs partners. This can be done by training additional water related enterprises and helping them reach market outside the current MUS intervention area. The Program was approached on several occasions by various stakeholders interested in MUS including local NGOs, neighboring communities, and local authorities of the municipalities of Magaria, Guidiguir, and Dogo Dogo and has in all occasions shared information with these stakeholders to promote access to safe drinking water.

3.2. Provide water supply through household water self-supply

To assess the possibility of providing water through household water self-supply, the Program through SKAT conducted a feasibility study in the regions of the Sud-Ouest and the Boucle de Mouhoun in Burkina Faso. The study assessed 552 water points in 14 villages in the two regions. The water points included traditional wells, protected wells and boreholes. The findings of the feasibility study showed that the traditional wells were the major source of potable water in the two target regions. In the region of Boucle de Mouhoun, 80% (259 wells) of the potable water sources were traditional wells, 15% (47) of the water sources were boreholes and 5% (17) were protected wells. In the Sud-Ouest region, 65% (148 wells) of potable sources were traditional wells, 21% (48) and 14% (33) were protected wells. In the two regions, the communities were motivated to improve the potable water supply as indicated by the high demand from households to improve their traditional wells. The findings of the study also showed that there were trained artisans in the intervention region for the construction of wells.

Based on the study findings, recommendations were made to; (1) organize comprehensive public information and awareness campaigns on the household self-supply approach; (2) demonstrate upgrading of existing traditional wells to promote their adoption in the intervention communities; and (3) to develop low cost technologies and facilitate household access to finance to meet the cost of investments for improving the wells.

From the results of the feasibility study, there were promising developments in Burkina Faso to pilot the household water self-supply approach in a few villages. To effectively implement the approach, four supporting pillars are required: (1) technology and technical advice for consumers; (2) a developed private sector; (3) access to micro-credit or savings mechanisms (using or aligned with the approaches developed by elsewhere in the program); and (4) policies and enabling environment which encourages individual initiatives. However, this activity was cancelled as a result of the September 2013 budget realignment.

3.3. Collaboration with commune of Dori

In Burkina Faso, the issue of safe drinking water is a big concern for the national government as well as the municipalities. According to Decree No. 2009 107/PRES/PM/MATD/MAHRH/MEF/MFPRE on the transfer of skills and resources of the state to the municipalities in the area of drinking water supply and sanitation in Burkina Faso, all the municipalities is responsible for supplying drinking water to the people of within their jurisdiction. The Commune of Dori is located in the Sahel Region of Burkina Faso. This region has high livestock production potential but the annual average rainfall is less than 500 mm.

The urban agglomeration of Dori is covered by a drinking water supply (DWS) network set up and managed by the National Office for Water and Sanitation (ONEA, in French). However, in the peripheral villages and camps, access to safe drinking water and sanitation is very low. The main conclusions of an analysis conducted by the municipality on water and sanitation level in the peripheral villages and camps include a deficiency of

improved water points, a low access rate to water (about 36%), a high failure rate (43%) of hand pumps, and the prevalence of waterborne diseases (malaria , diarrhea, Guinea worm).

The municipality of Dori asked for the technical support of ONEA to solve the problem of drinking water shortage faced by the inhabitants of the peripheral villages and camps. To address the issue of access to safe drinking water, a project was designed and co-funded by a number of partners including USAID WA-WASH. The overall objective of this project was to sustainably improve livelihoods in the peripheral villages and camps around the urban community of Dori. The total cost of the project is around 550 949 772 CFA (about 1 million USD). Working with the Mayor of the municipality, a number of partners including USAID WA-WASH contributed to the funding of this project. The 100,000 USD contribution of support of USAID WASH (10% of the total cost) was used to pay for the installation of the main distribution pipeline (64.5 km) and the water tower.

USAID WA-WASH conducted monitoring visits to assess the construction quality of the extension of the commune of Dori's piped water network and to better estimate the number of beneficiaries. The Program found that the network was extended to the selected villages according to standard quality requirements. USAID WA-WASH's contribution equipped also three boreholes located downstream from the dam of Yacouta. These boreholes with submersibles pumps deliver a debit of 9m³ per hour each. In accordance with the plans, a water tower of 150m³ (see Photo 7) was constructed in the village of Wendou, halfway between Yacouta and Dori. A total of 6.5km of pipes were used

Success story: USAID WA-WASH supports the municipality of Dori to meet the challenge of access to potable water.

Living in the village of Hugo-Samboel, Ramata Diallo recalled the ordeal she and other women have endured in the search of drinking water. "Before installing the public tap in our village, we were fetching water from ponds and boreholes equipped with hand pumps. Most of the time, we were obliged to spend a long time at the boreholes equipped with hand pumps, just to have a 20-liter water container. We suffered a lot in order to meet the water needs of our families." According to Mr. Amédé Sinini (Water and Sanitation Coordinator at the municipality of Dori), this situation was due to weak drinking water network of the National Office for Water and Sanitation (ONEA, in french). The network covered only 30% of the population, principally in the urban part of the municipality. With the support of technical and financial partners such as USAID WA-WASH, the municipality of Dori today made a qualitative leap in terms of people's access to adequate drinking water services.



Like Mrs. Mariama Hama (left) from the village of Selbo, the populations of Dori welcome the support of USAID WA-WASH

The use of water from the public taps has various advantages for beneficiary populations. "Since we have consumed water from the public tap, we no more suffer from diseases like stomach ache or diarrhea because the water is potable," says Mariama Hama from the village of Selbo. As for Binta Kéita from the village of N'Djomga, she lists another advantage that promotes financial independence of women: "In the past, we wasted enough time to fetch water. Currently, most of the women use the same time to carry out activities such as livestock or to practice trade that enable them to generate income." During a field visit of His Excellency Dr. Tulinabo Mushingi, US Ambassador to Burkina Faso (in December 2014), Moussa Dicko, president of one of the water users associations of the municipality of Dori said: "Because water chores are mostly reserved for women, some girls have refused to marry into villages where there was no drinking water supply. Nowadays, thanks to the support of USAID WA-WASH, this selection criterion for husbands is no longer an issue for our girls."

to connect the water tower to the boreholes and 58 km of pipes were used to connect the water tower to the public taps in 16 villages.

As part of the MoU signed with the municipality of Dori, the Burkina Faso National Water and Sanitation Office (ONEA) is responsible for ensuring the maintenance of the infrastructure and the quality of water for the whole Dori water system including rural and urban areas. Accordingly, water quality analyses were conducted by ONEA after the installation of the three boreholes that pump water to the water tower. These analyses revealed that the water is safe for the entire system, including the 16 villages benefiting from the project. Furthermore, ONEA's regional Dori lab randomly collects water samples from three water points on a daily basis in order to perform turbidity, bacteriological and physico-chemical analysis. This activity could include any water point throughout the piped system provided by ONEA as well as the dam of Yacouta. The water from the public taps installed by this project is therefore analyzed on a regular basis.

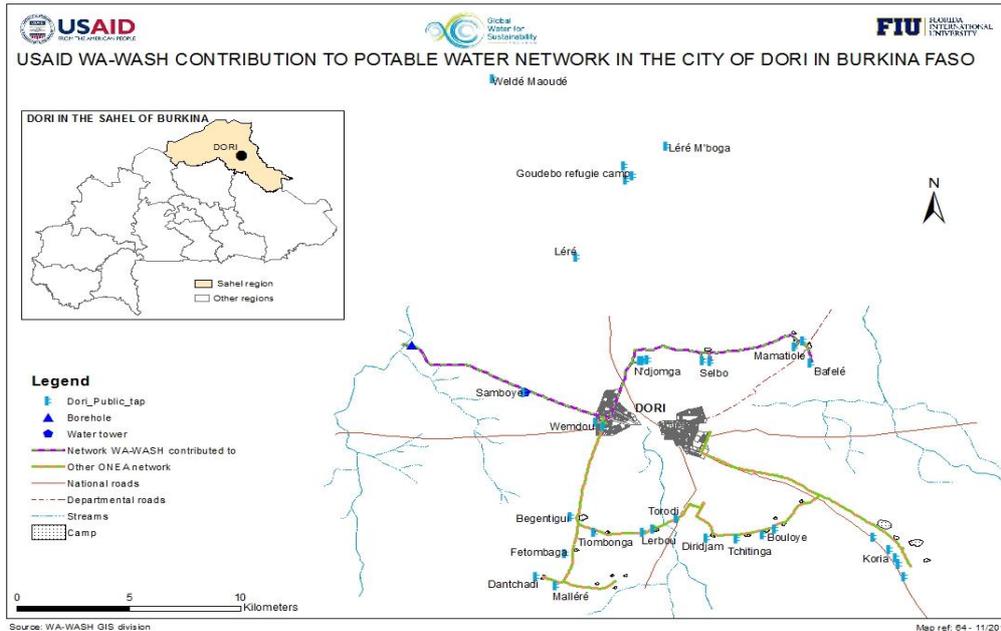
A total of 40 public taps were constructed (see Photo 8) within the target villages as shown on Map 2. Through these water points, 22,745 individuals gained access to an improved drinking water source. The water point managers buy the water from ONEA and charge the local beneficiaries. The water is sold at 5 FCFA for a 10 liter bucket, 10 FCFA for 20 liter container and 15 FCFA for a 30 liter container. These prices, regulated by ONEA, are affordable for the beneficiaries. However, USAID WA-WASH found that in some cases socio-cultural issues and traditional beliefs impede the effective usage of the new water points by the beneficiaries.



Photo 7: The water tower in the village of Wendou (FIU, Burkina Faso, 2014)



Photo 8: A public tap in the village of Wendou (FIU, Burkina Faso, 2014)



Map 2: Dori water system network, Sahel region (FIU, Burkina Faso 2014)

The extension of Dori’s water system to surrounding villages is a good example of collaboration between municipalities, donors and government’s agencies in providing safe drinking water to populations. Scaling up this approach in other municipalities will be a safeguard and an alternative for collapsing wells and the lack to water during the dry season.

3.4. Alternative water supply source development

Access to water is a major problem for the rural populations in the Sahel region. The USAID WA-WASH Program in the municipality of Tankougounadjé performed an Environmental Impact Assessment in the target villages which showed a lack of access to water, especially during the hot season. This was illustrated by the time taken by women in fetching water (up to 8 hours of per day). Deep and shallow wells as well as boreholes are the sources of water used by the population in the municipality. From the perspective of food security, the assessment showed that 80 % of households surveyed only manage to cover their food needs through their production for, at most, seven months of the year. A situation exacerbated by harmful effects of climate change, among other things.



Photo 9: A sand dam in the village of Moussoua (RAIN, Burkina Faso, 2014)

The activities implemented as part of the 3R approach to support improved water resources management” were aimed at improving access to drinking water by the construction of rainwater collection infrastructure, and improving agricultural production. USAID WA-WASH introduced the retention, recharge and reuse approach (3R) in the municipality of Tankougounadjé. RAIN Foundation and its local partner, Association des Volontaires pour le Développement au Sahel (VDS), together with the Provincial Director for Agriculture and Food Security (DPASA) of Yagha, the Chief of Tankougounadjé and stakeholders in the beneficiary villages, selected the most suitable sites based on the catchment and 3R measures identified by BERA and Acacia Water, two consulting firms.

A total of four sand dam were constructed in the target villages including one in Moussoua (see Photo 9), two in Tiena, and one in Keri. The VDS team coordinated the construction and the community collected stones and helped excavate. The sand dams started filling with water and sand during the 2014 rainy season. It will take several years until they achieve full maturity. The construction of sand dams and filtering dikes has helped to raise the water table and large diameter wells were constructed for domestic and productive uses. Two large-diameter wells, for potable water, were constructed within the influence zone of the sand-dams in Keri and one pastoral well was constructed for livestock watering in Tiena. Around the two wells in the village of Keri, two garden sites of 2,500m² each were established for the benefit of women who are a vulnerable segment of society (see Photo 10). The first site, operated by 18 women, was a success: vegetable production has improved the incomes of women with some of them earning more than 100,000 FCFA (\$200) for the sale of their products. It has also improved the quality of the community’s diet through the production of fresh vegetables (onions, tomatoes, cabbage, squash, lettuce, okra etc.).



Photo 10: A cross section of the garden in Keri (RAIN, Burkina Faso, 2015)

Access to water is even more difficult for vulnerable people, whether for drinking or for production, especially during the dry season. Consequently, the Program constructed water harvesting tanks for 18 vulnerable

households comprised of 149 people (see Photo 11). The beneficiaries mobilized local aggregates and water while the non-local materials were provided by the Program. USAID WA-WASH mobilized a team of masons trained on the construction of rainwater harvesting tanks. As of the end of the 2014 rainy season, the tanks were filled to a satisfactory level, in accordance with the recorded rainfall during this rainy season. Two beneficiaries per household were trained on proper management of the tanks before the start of the rainy season. Beneficiaries of rainwater harvesting tanks, users of water points and community leaders including members of the water users associations were sensitized and trained on sanitation and hygiene around water points. As a result, a radius of 10m has been defined around each water point where sanitation and hygiene infrastructure is prohibited. Furthermore, three boreholes were rehabilitated in Moussoua and Tiéna following an official request from the Mayor of Tankougounadjé to help reduce the shortage of water in these villages. As a result 900 additional people gained access to an improved drinking water source.

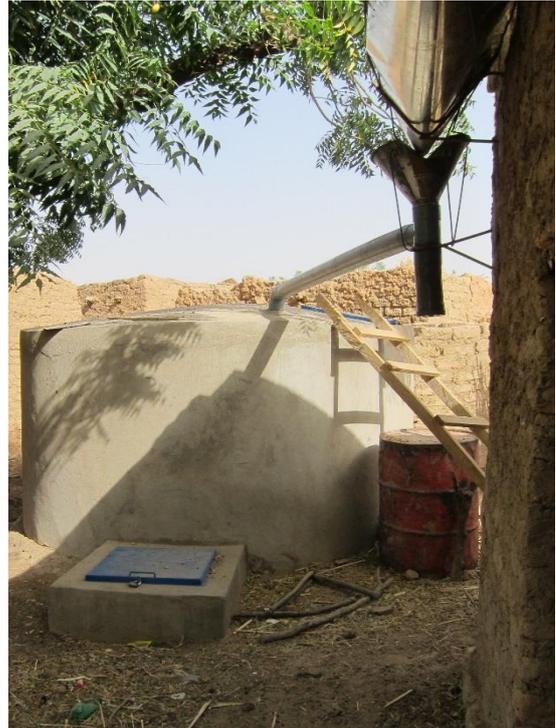


Photo 11: A rainwater harvesting tank in the village of Moussoua (RAIN, Burkina Faso, 2014)

USAID WA-WASH also assisted households who agreed to contribute their labor to build contour bands and manure pits (12m³) to improve agricultural yields (see Photo 12). Thirty manure pits were dug and will be supported with walls of locally collected stones and cement (see Photo 13). All beneficiaries were trained on composting techniques with the support of the Provincial Directorate of Agriculture and Food Security.



Photo 12: A contour band in the village of Moussoua (RAIN, Burkina Faso, 2014)



Photo 13: A manure pit in the village of Moussoua (RAIN, Burkina Faso, 2014)

In order to strengthen local knowledge on implementing the 3R approach, one staff member from VDS participated in an exchange visit on the 3R approach in Ethiopia June 8-11, 2015. This visit provided the opportunity to learn about various approaches and achievements in the area of rainwater harvesting and groundwater recharge. Different data collection tools and experiences were shared by participants and field visits were conducted to showcase 3R projects implemented in arid areas of Ethiopia with similar characteristics as the Sahel region of Burkina Faso.

Finally, two exchange visits were organized to other USAID WA-WASH partner's intervention areas (IRC and Winrock) in order to scale-up their activities and foster more integration of USAID WA-WASH's activities. Consequently, 22 members from the water user associations of Keri, Tiena, and Moussoua were taken to the municipality of Gorgadji where IRC implemented the sustainable service at scale (Triple-S) approach for better water services delivery. The participants received advice and guidance from their counterparts on how to manage hand pumps and ensure a sustainable service to the users.

The second exchange visit brought 17 producers (13 men and 4 women) from the commune of Tankougounadjé to the commune of Tanghin Dassouri where USAID WA-WASH implemented conservation farming. This visit was an opportunity for visitors to witness the results achieved by their counterparts receiving technical assistance from the Program in the domains of conservation agriculture, access to water and adaptation to climate change. As a result, the participants committed to replicate the conservation farming techniques learned in their respective communities.

Based on the achievements, an action plan was developed to scale up the activities implemented in the three villages. This plan provides support in negotiating additional funding. Fundraising activities are being conducted by VDS to raise the interest of relevant technical and financial partners involved in funding adaption

Success story: the village of Keri, an emerging oasis in the Sahel region of Burkina Faso

With support from USAID WA-WASH through its partner RAIN, the people of Kéri built filtrating walls to mitigate erosion, which was threatening farmland designated for the production of sorghum. Further, they constructed a sand dam that contributes to prevent soil erosion and replenish the water table, in addition to a well, which provides water for women to grow vegetables. The results of the commitment of the population of Keri are visible today. The hard work of the beneficiaries, from the first pickaxe in the dirt to prepare the ground, gave way to smiles of satisfaction. The results of this infrastructure include new income generating activities (such as gardening) that have positively impacted the lives of the beneficiaries. Mrs. Aïssatou Bocal is among the leaders of the 18 women who use the vegetable garden made possible by USAID WA-WASH. "We are really happy to receive the support of USAID WA-WASH. The greenness of our vegetable garden seems to defy the nearby desert. This proves that if we receive good coaching, we can tame the adversity of nature and get something out of it," she says.



The women of Kéri prepare their plots despite the winds of the dry season

Fellow gardener Mrs. Maimouna Hama also anticipates benefitting from this vegetable garden. "Through vegetable production, I hope to make an income of 130,000 FCFA (approximately \$210). With this money, I will buy sheep that I will raise. For the well-being of my family, I also use a portion of vegetables for our own consumption," she says. Given the availability of 3R infrastructure in the village of Keri, including a sand dam and filtrating walls in addition to high number of motivated women, USAID WA-WASH will construct one additional well for a second gardening site of 2,500 square meters in the village.

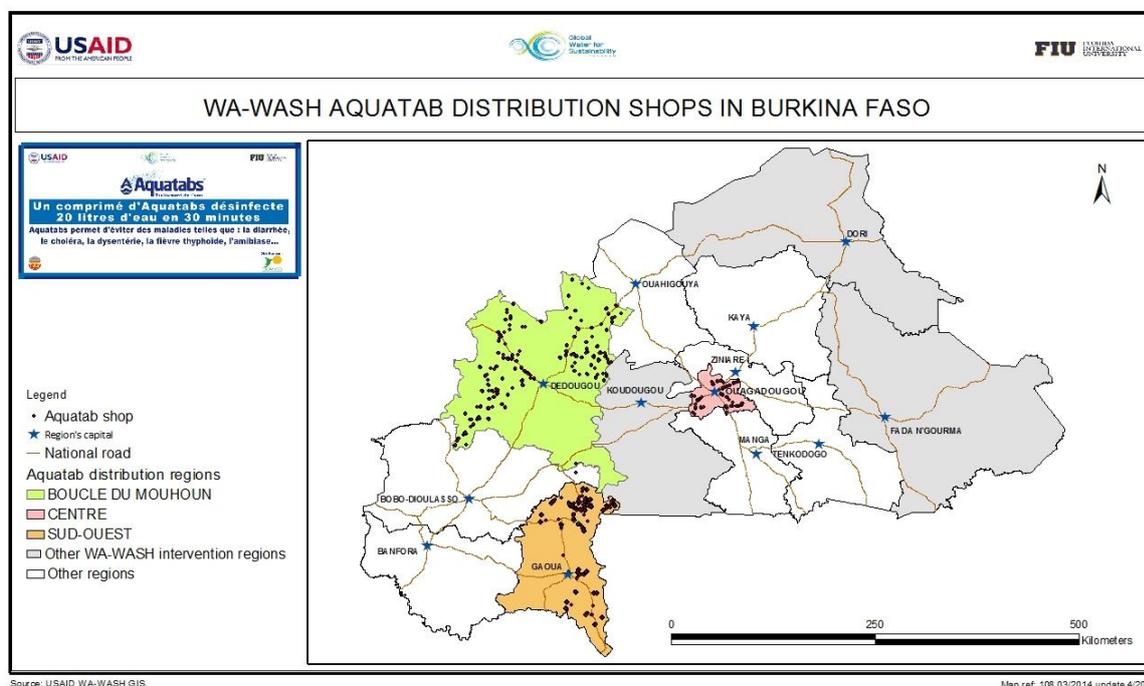
measures to climate change, access to drinking water, food security and nutrition, as the 3R approach can make a difference in the lives of people in the Sahel region.

3.5. Safe water handling, storage, and point-of-use (POU) treatment

3.5.1. Burkina Faso

For the implementation of safe water handling, storage and point-of-use (POU) treatment, USAID WA-WASH worked with Programme de Marketing Social et de Communication pour la Santé (PROMACO), a local NGO specialized in social marketing in Burkina Faso. At the onset of these activities, PROMACO conducted a baseline study which revealed that only 6% of households were using an appropriate water treatment methodology across the 132 target communities in the Centre, Sud-Ouest, and Boucle du Mouhoun regions. None of these household were using Aquatabs.

As part of the awareness campaign on safe drinking water, USAID WA-WASH identified and trained 264 community volunteers (one man and one women per community). A social marketing approach was developed to set-up a distribution network and create the demand for Aquatabs. Accordingly, the Program established 1,200 sale points (see Map 3) supported by eight wholesalers. The sales were promoted via 77 television spots in French, 4,260 radio spots in local languages, 101 market animations, 141 theater skits, and 17,490 group discussions around water points and other strategic places in the target communities. Over 264 radio broadcasts were recorded on USB sticks so that the community mobilizers could rebroadcast them during the sensitization meetings. These community level demand creation activities reached 117,628 men and 187,331 women.



Map 3: Aquatab distribution shops in Burkina Faso (FIU, Burkina Faso, 2015)

The awareness campaign resulted into 3,293,400 Aquatabs tablets sold in Burkina Faso since April 2013. According to a survey conducted from January 30 to February 10, 2015 to assess Aquatabs coverage in the

target communities, the current distribution network developed by PROMACO includes 1,200 shops, 183 community volunteers, 44 mobile vendors, one village development council and one municipal advisor. Another survey conducted in June 2015 to assess the level of correct usage of Aquatabs and identify factors undermining this behavior, revealed that 45% of the target communities know how to correctly use the product and 25% of them are regularly using Aquatabs.

USAID WA-WASH scaled up the use of Aquatabs in other region of Burkina Faso. PROMACO collaborated with other USAID WA-WASH implementing partners (IRC and VDS) to extend the Aquatabs distribution network to their intervention areas. In addition, 200,000 tablets were purchased by a French NGO (Action Contre la Faim) for distribution in their communities in the Eastern region of Burkina Faso. The Program also introduced Aquatabs in five communes of the provinces of Bam and Sanmatenga as part of a partnership with Catholic Relief Services (CRS). A total of 72,000 Aquatabs tablets were sold through this partnership.

To scale-up Aquatabs coverage at the national level, USAID WA-WASH promoted PoU activities during national and regional events including a harvest fair in Gaoua, where 49 new sales points were created and 36,000 tablets were sold (see Photo 14). Over 5,000 people visited the Aquatabs stand and the product was introduced to 1,952 other people on the Kampti local market. The Program also celebrated International Women's Day in the Hauts-Bassins region of Burkina Faso (see Photo 15). As a result, 10 Aquatabs sales points were created; 18,000 tablets were sold in the commune of Koti; and 4,000 people were reached by the sensitization sessions. At the national level, USAID WA-WASH introduced a number of government officials and agencies to the PoU approach including the Ministry of Water and ONEA with the idea that the government of Burkina Faso will incorporate PoU in its clean drinking water access strategy for the sustainable development goals.



Photo 14: Aquatabs stand during the harvest fair in Gaoua (PROMACO, Burkina Faso, 2015)



Photo 15: Aquatabs promotion during the international women's day in Koti (PROMACO, Burkina Faso, 2015)

3.5.2. Ghana

USAID WA-WASH implemented the point of use (PoU) water treatment activity in 50 communities in Lawra and Nandom districts in the Upper West region of Ghana. Active from January 2014 to July 2015, the main objectives were to increase the knowledge on the dangers of untreated water and boost awareness of, access to, and use of PoU products (Aquatabs and Crystal Pur filters). The baseline information indicated that 47% of households were treating water by boiling and using ash while 30% used white cloth filtering. Other materials used to treat water were lime/ lemon, salt, bean flour, and clay. Some respondents also reported filtering through cotton funnels.

As part of the promotion of PoU products, various methodologies and strategies were implemented including five stakeholder consultation, 36 community sessions per community, 75 individual household sessions, 48 radio discussions, four video shows per community, and a number of participatory learning and action (PLA) games. The major activities included building the capacity of community based hygiene volunteers/vendors to market water treatment products, conducting promotional activities in households and in public places such as markets, schools, and social gatherings (see Photo 16), organizing radio discussions and video shows with beneficiaries/users of the products, sensitizing community members on the importance of handwashing with soap/ash, and monitoring the efforts and results. The Program devoted a particular attention to surveys, which helped to understand existing water and sanitation practices as well as the outcome of the activities.



Photo 16: Public promotion of PoU products (CARE, Ghana, 2015)

In support to the awareness campaign, 139 community based volunteers/agents (63 men and 76 women) from the 50 communities were identified and trained to help make POU water treatment products readily available. The volunteers were trained on various topics to enhance their abilities, skills, attitudes and knowledge in the promotion of the POU products. The topics included volunteerism, teambuilding, marketing, record keeping and action planning at the zonal level. The training resulted in the formation of zonal groups to ensure the effective and efficient promotion of the products in their various communities

The cost of PoU product (\$5 for 1 Crystal Pur filter and \$0.35 for 1 strip of Aquatabs) was one challenge that kept some households from adopting better treatment methods. Another challenge was related to the particular smell of the water treated with Aquatabs, which caused hesitation among first-time users. The Program addressed both challenges by conducting frequent follow-ups and by broadcasting positive personal accounts in radio discussions.

The activities conducted to promote PoU products resulted in 1,200,000 tablets and 250 filters sold by the 95 active community vendors in the 50 communities, four regional- and district-level supply chains in the Upper West Region established, 394 hand-washing stations (tippy-taps) self-supplied in 24 communities leading to increased hand-washing practices in the targeted communities and beyond. The end-of-project survey revealed that 94% of the respondents gained knowledge on the products and 83% were treating water using either Aquatabs or Crystal Pur filter (out of this, 99.1% treat water with Aquatabs while 0.9% treat with the crystal Pur filters). Approximately 76% of women and 24% of men interviewed use the products correctly, respectively. Women recorded high proper usage rate due to the fact that they are responsible for household water provision and they are therefore more conscious about water quality issues.

The benefits reported by users include the reduction in diarrhea cases, the absence of stomach pains, an improved overall health, and the satisfaction with access to “pure” safe water locally. The promotion of PoU resulted in identifying other alternative promotional strategies such as market centers, schools, and churches. Moreover, PoU products presented new business opportunities, especially for those who sought to market to neighboring villages and to sell treated water in bottles.

A key lesson learned was the need to have a strong network of individuals to continue the promotion of products in the communities. These individuals should include community vendors, entrepreneurs, radio stations, local government authorities, and other interested stakeholders. Another lesson learned was the absolute necessity to link hygiene promotion to the promotion of any water technology.

The creation of a sustainable access to safe water appeared to enhance a sense of community solidarity in favor of collective development. To support the sustainability of efforts, the Program through APDO facilitated the development of a strong supply chain of the PoU products in the communities with 95 active vendors. USAID WA-WASH fostered linkages between vendors and suppliers at both the district and regional levels. PoU water treatment present a good investment opportunity for research in using and introducing local water purification technologies. This activity resulted in emerging health gains, which with proper research and partnership with government, could serve as basis to influence policy decisions. For future interventions, a focus on building strong supply chains and the capacities of community leaders and volunteers, particularly with regard to behavior change communication and marketing skills, is highly recommended.

3.5.3. Niger

For the implementation of safe water handling, storage and point-of-use (POU) treatment in Niger, USAID WA-WASH worked with ANIMAS SUTURA, a local NGO specialized in social marketing. Prior to the collaboration with the Program, ANIMAS SUTURA was already promoting Aquatabs with the support of KfW. ANIMAS-SUTURA’s Aquatabs social marketing campaign’s expansion funded by USAID WA-WASH started with the promotion and sale of Aquatabs in the pilot areas of Maradi and Tillabery in June 2013.

As part of the promotion of Aquatabs, various strategies were implemented including the broadcasting sketches on themes related to water and sanitation, the broadcasting of Aquatabs spots on private and community radios stations, the organization of radio debates, etc. The Aquatabs community-based distribution network included 462 villages with 1,848 community volunteers. Throughout the life of the Program in Niger, these volunteers conducted 11,419 group discussions on subjects related to safe drinking water, reaching approximately 348,510 people including 148,419 males and 200,382 females. In addition, 29 local radio stations (16 in Tillabery and 13 in Maradi) were used to broadcast 14,353 spots, 3,122 songs, 5,757 sketches and 136 live events related to the safe drinking water and treatment. The live events were designed to promote the proper use of Aquatabs, inform about the price and increase sales, encourage new retailers and influence target communities’ behavior with regard to water, sanitation, and hygiene. A partnership with the national wrestling federation helped support these live events (see Photo 17).



Photo 17: Wrestling champion Alio SALAO demonstrating how to use Aquatabs (ANIMAS SUTURA, Niger, 2014)

As a result of the promotion activities, USAID WA-WASH partner ANIMAS-SUTURA sold 5,696 000 Aquatabs tablets directly attributable to the Program in Niger. Regular monitoring of the Aquatabs distribution network was performed to verify stock availability and to create new points of sale. More than 576 sales points were created in the target regions since June 2013. The current social marketing system of ANIMAS SUTURA includes a community based distribution network supported by 2,252 community volunteers in 536 villages in Maradi, Tillabery and Tahoua; a traditional distribution network including three main distributors, 58 wholesalers, 296 trained semi-wholesalers, 726 non-trained semi-wholesalers and 14,226 retailers; a partnership with 60 local radios; three mobile teams to sustain the promotion of products; eight sales managers and two supervisors; a network of 44 community drugstores, 129 private drugstores and 89 drugs warehouses.

To ensure the sustainability of the PoU approach, ANIMAS SUTURA will build on the results gained under USAID WA-WASH and its social marketing network in Niger to reach the objective of 9,000,000 Aquatabs tablets sold annually. For this, ANIMAS SUTURA expects to extend its current social marketing network through a partnership with other organizations including Save the Children and CARE Niger.

3.6. Triple-s initiative / commune sustainability models

The baseline of the Triple-S initiative in Burkina Faso assessed the existing management models and their regulatory framework, and the level of water service delivered to local populations. The models and frameworks were assessed by looking at the mandates, the responsibilities and the performance of eight municipal authorities, 210 water user associations, one local private operator, over 800 water point managers, and 20 boreholes mechanics. The study indicated that the regulatory framework was in place in each municipality, indicative tariffs were set, contract mechanisms were in place and the support to implement current reforms was provided by the government. At the municipality level, the main common gaps include the royalties system, which is only partly operational and the current capacities of local mechanics to address the breakdowns. Moreover, the municipalities fail in supporting the local service providers in their roles, leaving only 3 water user associations over the 210 which comply with the regulatory framework.

The service levels delivered to populations were assessed using a sample of 24 villages across the eight municipalities. Extensive water point and household surveys were conducted to analyze the key information on water quality, the quantity used per household both in the dry and rainy seasons, the access to water and the reliability of water points. The study showed a similar pattern in the 24 villages; on average, less than 2%

of the population has the minimal level of service as defined by the national water authorities. These findings indicate that the population needs are not met for drinking water supply.

The Triple-S initiative implementation in Burkina Faso focused on action-research, learning and capacity building to improve the functioning and management of rural water services. The Program tested novel approaches and models to tackle the gaps and issues related to the management of rural water services. In two municipalities Gorgadji and Aribinda, the Program explored issues related to poor service delivery such as the quality of water delivered by hand pumps, household consumption patterns and motivations, the financial viability of the existing service delivery model, and the operating cost of hand pumps and small piped networks. In addition innovative approaches to address the weak maintenance of hand pumps were developed. The results of these studies were disseminated within the WASH sector in Burkina Faso (see Photo 18).

Furthermore, the Program supported the local authorities in setting up monitoring and planning processes. A monitoring system, involving the municipal technical WASH group, was developed and data on WASH service performance were collected on a quarterly basis. This data feeds the annual planning session and its semi-annual revision process. The regional WASH authorities were also supported with two technical assistants based in the Sahel region.

At the national level, various activities were implemented to scale up the experience of the two pilot municipalities. The Program worked closely with the national water authority to develop a national monitoring framework based on our experience in Gorgadji and Aribinda. This framework covers conceptual and operational approaches, as well as costs and financing models for an effective WASH service monitoring. In addition, the Program organized a number of workshops reaching over 450 professionals of the WASH sector. One key workshop is the training of 70 local authorities on WASH service governance. USAID WA-WASH also disseminated its experiences through a number of sharing events. One key event was the international seminar on monitoring and evaluation of local WASH services at rural level held in Ouagadougou in April 2014 (see Photo 19). This event was attended by over 200 participants from 30 countries. The objective of the seminar was to discuss approaches implemented in the field and to identify the strengths and weaknesses of the sector in areas such as monitoring of sanitation, water resource, and water services (small piped systems and hand pumps) and user satisfaction were covered.



Photo 18: Workshop on hand pump maintenance in Kaya (IRC, Burkina Faso, 2015)



Photo 19: Introduction session of the international seminar on rural water services monitoring (IRC, Burkina Faso, 2014)

The Triple-S activities were somewhat slowed down by the political unrest in Burkina Faso. The Ministry in charge of water and sanitation was reshuffled and incorporated into the Ministry of Agriculture, and the municipal councils and elected mayor were dismissed and replaced by local transitional committees. Our main institutional focal points at the national, regional and municipal levels were replaced and the Program devoted additional effort to embark the new transitional committee members.

At the municipality level, the Program recorded significant results including the reduction of the breakdown time of hand-pumps from over six days on average in September 2013 to one day in August 2015. This exceeds the national standards of three days, being an acceptable breakdown time. In addition, the water user associations were able to increase the number of households paying their water fees from 58% in 2013 to 86% in 2015. The resulting revenues increased from 9,162,200 FCFA in 2013 to over 26,000,000 FCFA in December 2014 in Aribinda and doubled in Gorgadji. Expenditures related to water services also increased with the support provided to the water user associations which are less reluctant in calling local mechanics to repair the hand pumps in case of a breakdown.

At the national level, the Program held over 15 national and regional workshops to disseminate its experience and proposals for an improved water service management. For instance, USAID WA-WASH through IRC played a facilitator role in overcoming issues around the management of small piped-system networks in 2012/2013. Another key reflection on the maintenance of hand pumps was shared with the WASH sector, breaking the taboo of local private operators. Furthermore, the Program worked with the Ministry in charge of water to help them develop an improved monitoring framework for municipalities at the national level.

Success story: Good water service monitoring reduces breakdown time in Gorgadji, Burkina Faso

In the municipality of Gorgadji, as in other rural communities of Burkina Faso, hand pumps tend to remain broken for several days or even months. The results of a first round of monitoring from October to December 2013 showed that the duration of outages in Gorgadji ranged between 2 and 33 days. These service outages are caused by low capacity of water point managers, insufficient fee recovery from water users and poor quality spare parts installed by pump repairers. Due to insufficient resources compounded by the non-collection of water fees, the municipality stopped performing preventive maintenance on pumps, weakening pump maintenance systems and leading to a higher breakdown rate. Further, the municipality did not have a system for monitoring pump status and thus could not respond rapidly and effectively in case of a breakdown. The municipality was unable able to address the situation. "We had a lot of problems in the past. WUAs, maintenance personnel, water point managers and water users, everyone was complaining about the lack of solutions to their problems," stated Ouedraogo Sadio, the mayor of Gorgadji.



The reduction of hand-pump breakdowns improved access to water in Gorgadji

The results of improved monitoring became obvious well before the municipality's self-imposed deadline. According to water and sanitation technician Sambo Sebgo, "In January, when we decided that a hand pump should be down no more than three days without being repaired, some people thought we were presumptuous, given the difficulties observed in the past. Less than six months later, we were doing even better!" "In Gorgadji, a hand pump cannot be down for more than 48 hours without being repaired" proudly agreed Tatenda P. Sebgo, president of the municipal water and sanitation council. He has reason to be proud; Gorgadji is likely the only municipality in Burkina Faso able to comply with the national regulations on public drinking water management in rural areas, which were adopted in 2000. This success was unimaginable only two years ago.

The sustainability of Triple-S activities was strengthened by a massive dissemination of the resulting products on water service delivery such as tools for institutional and service assessments, monitoring of water service performance and planning at the municipal and national levels. These products also include proposals for an improved professional maintenance of hand pumps and training materials to implement a monitoring system at the municipal level. These activities resulted in the Triple-S approach being scale-up by Oxfam Quebec in the Hauts-Bassin region of Burkina Faso to improve WASH services in five municipalities. The Program also shared its expertise in national platforms and among civil society. Moreover, USAID WA-WASH partner IRC will continue to work closely with the Ministry in charge of water and sanitation to promote the Triple-S approaches and experiences in national WASH sector platforms and through new projects.

4. SANITATION AND HYGIENE RELATED ACTIVITIES

The Program’s achievements related to sanitation and hygiene are summarized in Table 2.

Table 2: Sanitation and hygiene related indicators status as of December 31, 2015

Indicator Number	Indicators	LoP target	Results as of December 31, 2015
IN.05	Number of communities certified as “open defecation free” (ODF) as a result of USG assistance	69	44
IN.07	Number of people gaining access to an improved sanitation facility	39,124	62,625
IN.09	Percent of households with soap and water at a hand washing station commonly used by family members	33%	48%
IN.17	Number of new policies, laws, agreements, regulations, or investment agreements (public or private) implemented that promote access to improved water supply and sanitation	6	5
IN.47	Percent of households using an improved sanitation facility	67%	55%

The following activities were implemented in order to reach the targets stated above.

4.1. MULTIPLE USE SERVICES (MUS) PROVISION

4.1.1. BURKINA FASO

USAID WA-WASH conducted a baseline study in September 2012 to assess communities' knowledge on basic hygiene and associated behaviors within the MUS communities in Burkina Faso. The study revealed that only 38.8% of households were using improved drinking water sources and 85.9% of the households did not wash their hands with soap before meals. According to the findings of the study, community members have knowledge on good hygiene practices and their impact on health but very few households regularly apply these practices.

Based on these observations, USAID WA-WASH implemented hygiene promotion activities with a focus on handwashing with soap, safe water handling, and storage to increase the health outcomes of the improved water points installed in the MUS communities. The Program identified and trained lead hygienists to promote handwashing with soap in households and schools, and encourage the effective uptake of a low-cost technology for hand-washing "tippy-tap" in households. The "tippy-tap" model was selected in collaboration with community leaders and hygienists at the Program inception. The installation of the hand-washing stations was done by the trained hygienists for a small fee (200 FCFA = \$0.33) to encourage income generating activities. USAID WA-WASH equipped the lead hygienists with tool boxes to support the awareness raising campaign in their respective communities. The main topics covered during the awareness campaign included hand-washing with soap, hygiene of food with a focus on drinking water, hygiene around water points, linkages between hygiene and malnutrition, etc.



Photo 20: School handwashing station at Koukouldi (Winrock, Burkina Faso, 2014)

The proportion of the target population having good hygiene behavior was very low at the Program inception. In order to have at least 25% of the target households use hand-washing stations with soap, lead hygienists, and community mobilizers conducted door-to-door sensitization and a competition was organized in each community to encourage households to regularly use their hand-washing facility.

USAID WA-WASH trained 44 lead hygienists (one man and one woman per community) to promote good hygiene practices, install and monitor hand-washing stations in households. As a result, 2,303 hand-washing stations were installed by the lead hygienists within the MUS communities with the support of local NGO partners AMB and OCADES. The sensitization sessions reached 9,516 people including 1,921 men, 2,408 women, 2,767 boys, and 2,420 girls. A survey conducted in March 2015 showed that 42.8% of the households that have handwashing stations regularly wash their hands with soap. The same study revealed that 62.7% of the target households are now using an improved drinking water source as compared to 38.8% before USAID WA-WASH.

The promotion of hand-washing stations with soap was also conducted in schools to encourage children to serve as agents of change by bringing this practice to their homes. Consequently, the Program designed a model of hand-washing station for schools. These models are made by the same metal workshop producing the rope pumps for the water points. With sustainability in mind, the Program provided moderate subsidies

for the first demonstration units subsequently the schools were encouraged to fund entirely their hand-washing stations. This approach resulted in three hand-washing stations installed in schools in Vipalogo, Koukouldi and Tialgo (see Photo 20).

To ensure the sustainability of hygiene promotion activities, the hand-washing stations were made of local materials that are simple to install. This allows households to install the stations themselves. The success of this approach resulted in some households entirely funding their hand-washing stations. For hygiene around drinking water points, the trained water point management committees were encouraged to promote good hygiene practices and ensure a sustainable management.

4.1.2. GHANA

In Ghana, USAID WA-WASH used the same approach as for Burkina Faso to conduct hygiene promotion activities with a focus on handwashing with soap, safe water handling, and storage to increase the health outcomes of the improved water points installed in the MUS communities.

Following a baseline study conducted in March 2014, the Program identified and trained 15 community volunteers (10 men and 5 women) and 63 water point management committee members (39 men and 36 women) on hygiene promotion across the target communities in the Upper West region of Ghana. The main topics of the trainings included the relationship between hand-washing and health, tippy tap model construction and operation (see Photo 21), hygiene and sanitation around water points, and best practices related to hygiene and sanitation. In turn, the participants trained 295 household members through house-to-house sensitization on proper hand-washing and the installation of hand-washing stations with soap to be used by family members.



Photo 21: Volunteer during training on use of tippy-tap (Winrock, Ghana, 2015)

One of the main challenges in improving hygiene in the target communities was getting the households to adopt and use the Tippy Taps. This was addressed by talking to community members about the importance of proper hand-washing with soap and water, maintaining general hygiene in the household, and the effects of improper hygiene.

The hygiene promotion activities resulted in 750 handwashing stations with soap installed, of which 92% are regularly used by family members to improve health and personal hygiene within the MUS communities. In order to ensure the sustainability of this activity, the trained community volunteers were encouraged to continue to actively advocate for improved hygiene in their communities beyond USAID WA-WASH.

4.1.3. NIGER

USAID WA-WASH conducted a baseline study in September 2012 to assess communities' knowledge on basic hygiene and associated behaviors within the MUS communities in the Zinder region of Niger. The study showed that households in the MUS communities had a basic understanding of waterborne diseases, such as malaria and diarrhea, and their relation to hygiene and water quality. Only three (3) hand-washing stations were reported for the entire intervention area and they were all installed in schools. Hygiene conditions were very poor across all communities surveyed and the existing water management committees (previously established by other NGOs) lacked the tools and the training for hygiene promotion and community sensitization. According to the same study, malaria was the most frequently reported (100% of the respondents) water-related disease, followed by diarrhea (55.6%) and colds (27.8%).

In response to this situation, the Program combined different strategies including community sensitization, public demonstrations of water and hygiene technologies, and the use of CLTS tools such as “the walk of shame” (community members walk through their community to identify areas of open defecation) to trigger demand for safe drinking water and key hygiene behavior changes. The sensitization activities involved community hygienists who serve as channels for the dissemination of proper hygiene practices, particularly during general assemblies, celebrations, and other important community events. In support to these activities, USAID WA-WASH organized a hygiene promotion caravan tour in collaboration with “Tarma Mua Mai Haske–ANFANI”, a famous local drama group.

The Program equipped the community hygienists with tool boxes to support their hygiene promotion activities. They were also equipped with plastic containers and ropes for the construction of hand-washing stations (see Photo 22). The installation of the hand-washing stations was done for a small fee (100 FCFA=\$0.16) paid by the households in addition to their in kind contribution with wooden poles. In general, the fee paid by the beneficiaries is shared between the community hygienists and water user associations as a mean to secure additional resource for the maintenance of water facilities.

The cost of the soap used during the sensitization campaigns represented the major challenge for adopting good hygiene practices within the target communities. In order to overcome this challenge, community members were encouraged to use firewood ash as an alternative to soap.

The hygiene promotion activities resulted in the effective adoption of the tippy taps model as a hand-washing technology by the community members and the establishment of weekly cleaning days for public places. Over 1,768 hand washing stations were installed within the target community and 28.3% of them were frequently used by family members. A survey conducted in June 2014 showed that community members now better understand the reasons to frequently wash their hands at critical moments. The critical moments include: after relieving themselves (urination and defecation), before eating and preparing food, after farm activities and handling baby diapers.



Photo 22: A girl washing her hands in Tounkourous (Winrock, Ghana, 2015)

4.2. COMMUNITY LED TOTAL SANITATION (CLTS) AND SANITATION MARKETING

4.2.1. BURKINA FASO

USAID WA-WASH sanitation activities were conducted by four different partners in Burkina Faso (WaterAid, WSA, IRC and FIU).

WaterAid conducted a start-up workshop with the local partners (Sahel Solidarité (SASO), Action Micro Barrage (AMB), and VARENA-ASSO). The workshop aimed to plan for the implementation of the USAID WA-WASH Program. Four municipalities were selected including the municipality of Bakin in the Northern region, municipality of Dano in the South-West region, and the municipalities of Ramongo and Imasgo in the centre-West region.

WaterAid carried out a baseline study in 24 communities in the municipalities of Bokin and Dano. The sanitation activities were not implemented in the municipalities of Ramongo and Ismago because there was another Program supported by the European Union. The Program triggered community led total sanitation (CLTS) in 21 communities. Following CLTS-triggering, WaterAid established 21 sanitation shops in each intervention community (at the village level) rather than markets (usually established at the municipality level). This strategy enables local communities to have immediate access to materials for construction within the village. In addition, 24 hygiene promoters were trained to raise awareness in the communities on good hygiene and sanitation practices.

The Program held a training session in January 2013 in Dano targeting 24 masons (see Photo 23). This training session focused on latrines' construction (Sanplat and VIP models). In addition, four masons were trained to build household latrines adapted to physically handicapped people. The design of latrines for the physically handicapped included ramps to facilitate access and support while using the latrine. As a result, 120 household latrines were constructed across the target communities.



Photo 23: Training of masons in Dano (WaterAid, January 2013, Burkina Faso)

The socio-political conflict in Mali caused insecurity in some intervention areas in Burkina Faso. In addition, there were legislative and municipal electoral campaigns at the end of 2012. This had an impact on the involvement municipalities in this program activities. The insecurity in some areas and the electoral campaigns delayed the implementation of activities such as updating the local MDG and organizing a conference on decentralization challenges in the WASH sector. Moreover, rainfalls continued in September 2012 and many intervention areas remained inaccessible. These activities ceased in February 2013 when WaterAid's sub

agreement was terminated. The activities were e re-launched using a different approach with WSA and then FIU.

In June 2014, USAID WA-WASH through partner WSA re-launched sanitation activities in 21 villages of the Centre, Centre-Ouest, and Boucle du Mouhoun regions of Burkina Faso with co-funding from the National Lottery of Burkina. Accordingly, the Program conducted a baseline study which revealed that over 96% of the target populations practiced open defecation and diarrhea was the most common disease.

In line with Burkina Faso sanitation policies and strategies, USAID WA-WASH used the community led total sanitation (CLTS) approach with subsidies for beneficiary households within the 21 targeted communities. The program worked with communal authorities to identify and trained 48 masons, 44 sani-shop managers, 12 monitoring committee members and 10 CLTS facilitators to support the communities to implement and monitor their sanitation action plans. The masons were trained on the construction of ventilated improved pit (VIP) latrines promoted by the Program in Burkina Faso.

Key promotional activities including sensitization, demonstrations in public forums, and home visit were conducted to achieve the Program objectives. USAID WA-WASH also facilitated the selection of vulnerable households in collaboration with community members and arranged the construction of fully subsidized latrines and hand washing stations for these vulnerable households including people with disabilities for which the latrines were adapted.

USAID WA-WASH partner WSA faced logistical and management challenges during the implementation of sanitation activities within the 21 target communities. The resulting

Success story: USAID WA-WASH promotes self-supply latrines through the CLTS approach in Burkina Faso

On August 11, 2014, the USAID WA-WASH Program officially re-launched an activity to support communities to promote hygiene and sanitation in 21 villages of Burkina by using the community-led total sanitation (CLTS) approach. Through this approach, USAID WA-WASH subsidized the construction of 1,512 latrines for the benefit of 21 villages. In the village of Weglega, the support of the Program allowed to subsidize the construction of 72 latrines. The criteria for getting the latrines were defined by the community itself. Mr. Rasmané Sawadogo attended the different triggering events conducted in the village of weglega. Unfortunately, he was not among the beneficiaries of the 72 subsidized latrines granted to the village.



Mr. Rasmané Sawadogo standing by his latrine in Weglega

As a result of the different awareness sessions in which he participated, Mr. Rasmané Sawadogo took the initiative to construct his own latrine without any subsidy. According to him, a latrine is not just a trivial facility, but rather something which can greatly contribute to improve the living conditions of his family. He positively appreciates the use of the latrine he constructed by the members of his household: "Look around you; you will not see human and animal feces which pollute our waters and food. With the intervention of the USAID WA-WASH Program in our community, we are now aware that open defecation constitutes a danger for us". Mr. Rasmané Sawadogo welcomed the initiative of USAID WA-WASH to support people to have sanitation facilities. As the Program cannot help everyone in the community, he urges those who did not get the support of USAID WA-WASH to fund the construction of their own latrines. For him, the village will get more benefit if everyone adopts this approach. "As it is better to prevent than to cure, I prefer to invest in the construction of a latrine and protect my family from diseases that could make me spend more money in health care", he says.

delays brought the implementation into the rainy season, leading to less involvement from community members and low realizations. In order to address this challenge and to ensure the successful completion of this activity, FIU took over the implementation of sanitation activities from its local partner WSA.

Another challenge was related to subsidies required by the national standards in Burkina Faso. Very few households have entirely funded their latrines and this situation undermines the outcomes of the sensitization campaigns. To influence this policy, USAID WA-WASH organized from June 9 to 11, 2015, a study tour to the Upper West region of North Ghana for the authorities in charge of WASH, technical and financial partners, and NGOs from Burkina Faso to learn from Ghana's experience with CLTS without subsidies. This study tour was followed by an experience sharing workshop held in October 2, 2015 in Ouagadougou. The participants recognized the limits of the subsidy policy in Burkina Faso and they committed to continue the reflection on possible improvements.

Despite these challenges, 1,512 latrines were constructed (see Photo 24) across the 21 communities, providing access to improved sanitation facilities for 11,849 people (5,141 men and 6,708 women). USAID WA-WASH subsidized 100% of 101 latrines for the benefit of vulnerable households (see Photo 25). The sensitization sessions on hand washing, sanitation related diseases and the maintenance of latrines, delivered by community animators using tool box images, reached a total of 16,003 people (8,355 men and 7,648 women).



Photo 24: Mr. Gnomou Seite in front of his first latrine in Moko (FIU, Burkina Faso, 2015)



Photo 25: Example of latrine for vulnerable households in Moko (FIU, Burkina Faso, 2015)

As part of a partnership with the European Union, USAID WA-WASH through its partner IRC committed to provide, in 2015, 3,400 households (the whole program plans to build 14,380 latrines over a four year period) with improved sanitation facilities in the Eastern region of Burkina Faso. As part of these activities, the Program conducted, in January 2015, a quantitative baseline study to assess sanitation demand and household needs. The study revealed that the majority of targeted household do not have a sanitation facility and experience poor hygiene conditions, regardless of socio-economic or ethnic and religious background. In order to improve this situation, 441 masons (all men) and 12 municipal technicians (all men) were trained on latrine construction. The Program also employed within three of the six target municipalities the skills of the 360 masons already trained by a former project, SaniFaso.

The implementation of sanitation activities in the Eastern region of Burkina Faso were disrupted by the political unrest in the country. As a consequence, the training of masons and hygienists and related activities were

delayed, reducing the implementation period of the planned activities. Despite this important challenge, the Program was able to deliver the planned sanitation infrastructures.

As of September 2015, 3,408 latrines (see Photo 26) and 39 showers were constructed within the six municipalities. Hygiene promotion campaigns started in all six municipalities after the identification and training of over 429 hygienists (see Photo 27). The promotion campaigns were conducted through village assemblies and household visits. A total of 4,027 households were reached by these outreach events.



Photo 26: A completed household latrine in the municipality of Coalla (IRC, Burkina Faso, 2015)



Photo 27: Training of hygienists in Bilanga (IRC, Burkina Faso, 2015)

Beyond USAID WA-WASH, the sanitation activities in the Eastern region of Burkina Faso will continue through 2017 with funding from the European Union. Over 50 communities are targeted to be certified open defecation free (ODF) by this date.

4.2.2. GHANA

USAID WA-WASH sanitation activities were initially conducted by WaterAid in Ghana before handing them over to CARE after WaterAid's contract termination. WaterAid conducted a baseline study to benchmark the indicators set in the USAID WA-WASH performance monitoring plan. The baseline study covered 24 intervention communities in the districts of Gushegu, Bawku West, Bongo and Wa East. The local implementing partners in Ghana were New Energy, BEWDA, PRONET North and Rural Aid. Participatory meetings were held with community stakeholders including chiefs and elders, opinion leaders, men, women and children to dialogue and identify community WASH needs and priorities in 24 communities in the 4 intervention districts. The findings of the study showed that 98% of the population in the target area practiced open defecation. The major source of water was hand dug wells (65%) and 35% was improved water points. All the intervention villages had water and sanitation committees. However, when it comes to basic hygiene practices, 100% of the community members did not practice hand washing.

Following the results of WaterAid baseline study, the local partners trained community hygiene volunteers (CHV) in the 24 communities. The training empowered CHVs to lead and champion hygiene promotion activities in their respective communities, including the CLTS process and hand washing with soap. Beneficiaries of the hygiene training sessions were equipped to serve as change agents, driving sanitation and hygiene behavior change in project communities. They were also capable of influencing change in their neighboring communities and among their social networks. As part of the efforts to build WASH capacity at the community level, WASH facility and service committees were formed in 24 communities, including 24

Water and Sanitation (WatSan) committees and six school hygiene clubs (SHC) in the 24 communities. The committees were trained and supported to champion the cause of sanitation and hygiene behavior change at the community level. To promote equity and inclusion, women, disabled people and other socially excluded members of the local populations were included in the committees. These activities ceased in February 2013 when WaterAid's sub agreement was terminated. The activities were re-launched using a different approach with CARE.

USAID WA-WASH through CARE implemented sanitation and hygiene activities in 29 communities within the Lawra, Nandom, and Nadowli districts of the Upper West Region of Ghana. At the Program inception, only 4% of households in all communities had access to improved sanitation facilities (53 existing latrines), while none of them had handwashing stations though people knew the importance of latrines and hand washing. Open defecation was the norm within the target communities, leading to a high prevalence of diarrhea (especially among children), a lack of privacy and dignity (especially important for women), poor environmental sanitation, and dangers such as snakebite.

In accordance with Ghana's sanitation policies and strategies, USAID WA-WASH used the community led total sanitation (CLTS) approach without subsidies to households. For this, various actions were undertaken to achieve the Program objectives including capacity building, sensitization, demonstrations, and awareness campaigns. The process began with the capacity building efforts on the CLTS concept and approach to 50 staff members (35 men and 15 women) from CARE, district health and sanitation, and local NGO partners. The Program identified and trained 166 natural leaders (101 men and 65 women), and 23 community chiefs were engaged to raise their interest and use their leadership influence in leading sanitation campaigns in their communities. The Program reached out to community members using various platforms such as VSLA meetings and radio discussions on sanitation issues with the support of information, education and communication / behavior change communication (IEC/BCC) materials developed on relevant themes.

To develop the latrine supply chain, the USAID WA-WASH identified and trained 31 latrine artisans on various types of simple improved latrines which could be constructed at the household level (see Photo 28). In collaboration with the Lawra and Nandom district environmental health and sanitation units, the Program established two sanitation markets at strategic points to showcase the different types of latrines and hand-washing facilities available in the area, as well as the necessary quantities of materials for each latrine type, and the contacts of the trained latrine artisans. Furthermore, the Program used the celebrations of the Global Handwashing Day and the World Toilet Day at the district level as a platform to raise awareness on the importance of sanitation and hygiene. Open-defecation free (ODF) celebrations were organized to award communities and to reiterate the need for families to cease open-defecation by building and using latrines.



Photo 28: Different types of household latrines across the CLTS communities (CARE, Ghana, 2015)

USAID WA-WASH sanitation approach entailed engaging school children to serve as agents of change in households through the WASH in School (WiNS) interventions. The WiNS intervention trained and equipped 120 teachers (68 men and 52 women) from 15 schools with IEC materials for hygiene and sanitation promotion at the school level. Over 25,654 students (13,138 boys and 12,516 girls) from 131 schools in the Lawra and Nandom districts benefitted from handwashing facilities installed by the Program. Furthermore, two (2) girl-friendly latrines and seven (7) new girl-friendly urinals were constructed in two schools, and six (6) dilapidated school latrines were rehabilitated. At the household and school levels, USAID WA-WASH introduced Tippy-Tap devices as part of the hand-washing campaigns. Further, monitoring visits recorded 1,042 households with hand-washing stations installed close to the household latrines or at other strategic points within the household.

Despite its successes, the Program encountered some challenges including the collapsing of latrines during the rainy season in some communities in the first year of the intervention. These latrines were located in low-lying areas with porous soil texture and non-plastering walls. Therefore the refresher training of latrine artisans focused on the proper siting of latrines and the appropriate use of local materials. Households whose latrines collapsed rebuilt them on higher ground with solid soil texture and used cow dung to plaster the walls.

Another challenge was the presence of flies around the latrines, posing a health risk for the households. Through the natural leaders' training on hygiene management of latrines, households received information on

Success story: CLTS spreads organically in northern Ghana

Naa Sylvester Yelviel is the chief of Kamba Tanzu, a rural community in the Nandom district of the Upper West Region of Ghana. Kamba Tanzu has a population of 270 people. The community was certified open defecation free (ODF) following triggering for community led total sanitation (CLTS) by the USAID WA-WASH Program. Chief Yelviel was very instrumental in sensitizing his community to achieving the ODF status. He describes the changes in his community since the USAID WA-WASH intervention: "Pigs no longer die from eating our feces, we have latrines in every house and we wash our hands before and after eating and after going to the toilet. We also have a new borehole that was provided by USAID WA-WASH." Traditional leaders like Chief Yelviel are the guardians of native wisdom, power and good governance, and are central to the USAID WA-WASH sanitation and hygiene promotion approach in Ghana. The Program builds the capacity of these traditional leaders using behavior change communication tools to promote proper hygiene practices. Since its inception, USAID WA-WASH has engaged chiefs, queen mothers and custodians of ancestral rule of law to play an astonishing role in changing men's and women's attitudes about sanitation.



The chief of kamba Tanzu near his latrine

Understanding the importance of sanitation and hygiene and having achieved ODF status for his own community, Naa Sylvester Yelviel decided to trigger three neighboring communities for CLTS in October 2014. He says, "If my community has latrines and the surrounding ones do not have latrines, they can still bring diseases to my community. So I decided to educate nearby communities on the need to have latrines." The communities chosen by Chief Yelviel were Horba, Kamba Pare and Pognyaa. He worked to educate and sensitize the members of these three communities using the CLTS approach. Now, according to the chief, almost every household in the three communities has a latrine. Further, all three communities were declared ODF as of April 2015. When asked how he felt about this success, Naa Sylvester Yelviel said: "I am happy that my community has been declared ODF and the other three communities have also been declared ODF. I will not stop the good work I am doing, I will continue to enter other communities to educate and sensitize them on sanitation issues. My only problem is that I don't have the means to keep going to these communities since they are far from my community. I would like to thank the USAID WA-WASH Program for all the support they gave me."

traditional fly repellents like ash and neem seeds. Consequently, households regained interest and constructed more latrines.

After approximately 20 months of implementation of the CLTS approach, 1,040 households in 29 communities constructed latrines without subsidies. As a result, 3,811 men and 3,969 women gained access to improved sanitation facilities. The CLTS approach was also extended to four additional communities outside the target intervention area as a result of the work done by some community chiefs and the environmental health and sanitation department of the districts. The success of this activity led to 245 household latrines constructed outside the Program intervention area. This brings the total number of household latrines constructed to 1,285 since the beginning of sanitation activities in Ghana. In collaboration with the USAID WA-WASH Program, the Nandom and Lawra district assemblies presented a list of 33 USAID WA-WASH communities to the Upper West Regional Inter-Agency Coordination Committee on Sanitation (RICCS) and invited them to officially verify and certify these communities as open defecation free (ODF) communities. As a result, 24 out of the 33 communities successfully went through the external verification process by the RICCS and were certified ODF.

The community members report improvements in health, such as a reduced prevalence of diarrhea. They also reported numerous psychosocial changes, such as the pride in seeing improved cleanliness, relief in the reduction in environmental odor, appreciation of the convenience of having latrines nearby (especially for elderly or disabled individuals), and an increased sense of dignity from being able to attend to physical needs in privacy rather than in the bush. Another psychosocial change is the pride of latrine ownership and the ODF status reported by many people in the communities and the empowerment of understanding why hygiene and sanitation are important. Strong community level engagement coupled with radio discussions have created deep awareness on the importance of sanitation and hygiene among community members. Communities have maintained good environmental sanitation, clean surroundings, clean latrines and improved personal hygiene. Households in the communities take responsibility for cleaning around their yards which was not the case before the Program launched CLTS.

As part of the sustainability strategy, USAID WA-WASH supported the development of the District Environmental Sanitation Strategy and Action Plan (DESSAP) for the Lawra and Nandom districts. These plans serve as a blueprint for the implementation and coordination of sanitation interventions in the districts. In another measure of sustainability, the Program demonstrated that a no-subsidy approach of community mobilization spearheaded by community members and leaders can be very successful. The engagement of community chiefs, peer leaders, and the latrine artisans created a sense of local ownership of the CLTS intervention. An opportunity for future investment is strengthening the supply chain by developing simple and affordable latrine-related products with favorable financing mechanisms for rural households.

4.2.3. NIGER

USAID WA-WASH sanitation activities were initially conducted by WaterAid in Niger before handing over to Winrock after their contract termination. WaterAid implemented its activities in five regions namely Maradi, Dosso, Tahoua, Tillabery and Zinder. The Program worked in partnership with four local NGOs (VALPRO, GAMA, DEMI-E and AREN) and an international NGO (Water and Sanitation for Africa), and in collaboration with the municipalities. WaterAid conducted a rapid assessment of the WASH sector in 16 intervention villages. The rapid assessment analyzed knowledge, attitudes and practices (KAP) of the population in relation to drinking water, hygiene and sanitation. According to the results of the rapid assessment, each village had a rehabilitated well and the members of the community had significant knowledge on hygiene practices and

water treatment options such as boiling and use of filters. In relation to sanitation facilities, 100 % of the population in the intervention villages did not have household latrines and practiced open defecation.

Based on the findings of the KAP assessments, CLTS triggering took place in 11 villages. As a result, 365 households showed interest in constructing household latrines and adopting good hygiene practices. Five action research groups (ARGs) were established to research on access to sanitation among the pastoralists through the CLTS approach. The objective was to develop an approach and materials for pastoral communities in order to promote CLTS. The five groups were trained to conduct action research through training on conducting action-research and carrying out CLTS.

To market and promote sanitation, the Program through WaterAid established four slab production centers that are managed by the communities in collaboration with and under the collaboration of the municipalities. The price of slabs and masonry fees, were mutually agreed to between stakeholders (municipality, masons, communities) with the support of the project manager. These centers enabled the local population to get SanPlat slabs and construction materials to build latrines. This enhances the adoption of sanitation facilities by the local communities. The Program distributed 200 animation booklets on hygiene and sanitation transformation (PHAST) to the implementation teams and action groups set up in villages (CLTS, hygiene, and water point management committees). In addition, a technical guide on hygiene was distributed in the five municipalities. WaterAid also designed and produced a kit of PHAST pictures for hygiene and sanitation promotion in the intervention villages that includes 40 pictures. The themes included within these kits include: hand washing; cleanliness at the village level; water storage; water collection and transport; and solid waste management. These pictures/booklets informed the local communities on bad and good hygiene practices and their consequences.

USAID WA-WASH trained 18 masons in the five intervention regions in latrine construction (specifically, slab construction and calculation of latrine depth given to the water table level), and provided them with equipment to construct SanPlat slabs. The 18 masons were supported with a manual on construction of Sanplat latrines. As a result 207 Sanplat latrines were constructed in 23 villages. In addition, two blocks of school latrines were constructed in Tamné-Tamné and Guidan Amoumoune. In total, 472 students benefited from these facilities and from a clean environment. WASH school clubs were established in these schools to raise awareness among the local community and to regularly maintain the latrines and sanitation environment at school. These activities ceased in February 2013 when WaterAid's sub agreement was terminated. The sanitation activities were re-launched using a different approach with Winrock.

USAID WA-WASH through partner Winrock contracted local NGO DEMI-E for community led total sanitation (CLTS) implementation in 25 villages and 10 schools in the Program intervention area in the region of Zinder (communes of Gouna, Wacha, Guidimouni and Bande). The villages were selected based on five criteria: existence of a modern water point, density of population, population greater than or equal to 200 inhabitants, existence of a school and social cohesion. A baseline study conducted in January 2014 revealed 125 traditional and modern latrines in the 25 villages. Most of these latrines were poorly maintained. The study also revealed that the existing latrines were shared between several households, leading to challenges related to pit emptying. The Program also identified 83 masons during the baseline study, including 28 who had already been trained on latrine construction by an Irish NGO GOAL. It should also be noted that in the intervention villages there were 77 hygienists trained by USAID WA-WASH, equipped with PHAST materials and already conducting hygiene promotion at the household and community levels

Another study was conducted in April 2014 to select a latrine model and assess the willingness of households to pay for sanitation. As a result, the Program and target communities selected the SanPlat latrine model, which is constructed of local materials (see Photo 29). All 25 villages were triggered for CLTS in March and April 2014. The triggering tools used included defecation area transects (“the walk of shame”), mapping of defecation areas, calculations of shit and medical expenses, and the glass of water test. During triggering, villagers were told that vulnerable residents may benefit from subsidies, depending on their degree of vulnerability and the allocation of latrines. USAID WA-WASH identified and trained 50 natural leaders (25 men and 25 women), 1,215 soap makers, and 25 masons (see Photo 30) within the 25 target communities to support ending open-defecation.



Photo 29: Household latrine in Biri (Winrock, 2014, Niger)



Photo 30: Training on San Plat latrine construction in Gouna (Winrock, 2014, Niger)

Furthermore, the Program conducted community sensitization with the support of 48 community hygienists (18 men and 30 women), 50 key opinion leaders (25 men and 25 women), 25 local WASH committees, 22 students (11 girls and 11 boys), and 11 teachers from 10 schools. These stakeholders were trained on topics including the CLTS approach, hygiene in schools and households, consequences of not washing hands and open defecation, latrines construction, and transmission pathways of waterborne diseases. Over 2,000 people were directly reached by the community sensitizations.

The short implementation period (six months) represented the major challenge of CLTS implementation in Niger although significant results were achieved due to the fact that all of the villages targeted for CLTS implementation were located in USAID WA-WASH’s zone of intervention for MUS. Another challenge resulted from the fact that some women were not comfortable with sharing latrines with their husbands and children because the traditional latrines were not properly fenced. This challenge was overcome by sensitizing households on proper latrine fencing using local materials and integrating gender consideration in the design and construction of shared sanitation facilities.

The implementation of CLTS activities resulted in the construction of four (4) blocks of school latrines and 1 970 household latrines including 293 improved latrines for vulnerable households and 1 677 traditional latrines entirely funded by the beneficiaries. As a result, 9 549 people gained access to an improved sanitation facility across the 25 target communities in the region of Zinder. This brings the percentage of households using an improved sanitation facility to 63% as compared to 4% before the Program activities started in the target communities. In July 2014, USAID WA-WASH organized a ceremony to certify ten communities as open defecation free.

Success Story: USAID WA-WASH promotes self-supply for latrine construction in Niger

Yakanayé is a community located in the Zinder region of Niger. Like the 24 other community selected for CLTS, the sanitation conditions were very poor in Yakanayé. Most of the community members practiced open defecation and sanitation related diseases were frequent. In April 2014, USAID WA-WASH triggered CLTS in the community. As a result, 96 households were built including 87 entirely funded by the beneficiaries.



Habou proudly showing the latrine he built for his grandmother

Tchougoulou Habou, a seven year-old boy living in Yakanayé, lost his mother at birth and he was left with nothing but the tiny hut he shares with his grandmother. As latrine constructions spread across his community, Tchougoulou decided to build one for his grandmother. "I built the latrine for my grandmother because she is not strong enough to build a latrine" he said. Tchougoulou also built another latrine for one of his neighbors who refer to him as a "courageous child". The no-subsidy approach promoted in Niger provided safeguards for the sustainability of sanitation activities as most of target households entirely funded their latrines as demonstrated by Tchougoulou Habou.

5. Climate change related activities

The Program's achievements related to climate change are summarized in Table 3.

Table 3: Climate change related indicators status as of December 31, 2015

Indicator Number	Indicators	LoP target	Results as of December 31, 2015
IN.26	Number of people receiving training in global climate change as a result of USG assistance	671	2,165
IN.27	Number of stakeholders with increased capacity to adapt to the impacts of climate variability and change as a result of USG assistance	1,665	5,657
IN.28	Number of climate vulnerability assessments conducted as a result of USG assistance	25	27
IN.29	Number of stakeholders using climate information in their decision making as a result of USG assistance	115	122

The following activities were implemented in order to reach the targets stated above.

5.1. WASH adaptation to climate change

5.1.1. CVCA capacity building/training; Community based adaptation training

USAID WA-WASH conducted various climate adaptation activities in communities in Burkina Faso, Ghana, and Niger to strengthen their capacities to face continuous hazards and disasters and to adapt to climate change in the long term. The target communities had little access to climate/weather information to guide the planning of farming activities. With limited options for alternative livelihoods, climate-related challenges represented a threat to their existence.

Three main climate change adaptation strategies and methodologies were used under the USAID WA-WASH Program: climate vulnerability and capacity analysis (CVCA), which is a risk analysis process, community-based adaptation (CBA) initiatives, whose primary objective is to improve the capacity of local communities to adapt to climate change, and participatory scenario planning (PSP) which focus on regional climate and rainfall scenarios. The Program aimed to inform, train, and share these tools with participants to facilitate the analysis their vulnerabilities and create adaptive strategies.

The main challenge of this activity was to ensure the sustainability of the knowledge gained by the target participants. For this, USAID WA-WASH through CARE organized an adaptation learning program (ALP) study tour in Ghana for seven Burkinabe participants (6 men and 1 woman), from public agricultural services, local NGOs and farmers' associations, to increase the likelihood that they will be used as resources by government agencies to scale-up the Program's climate change activities in more communities. The participants gained improved capacity to conduct CVCA, CBA and participatory scenario planning (PSP) processes as means to mitigate the adverse impacts of climate change.

Another challenge was related to communities' capacity to mobilized sufficient resources and skills to implement the strategies include in the CBA plans. In order to address this challenge, the validated CBA plans were submitted to the municipalities in presence of local authorities, traditional leaders, government technical agencies of agriculture, veterinary, environment, and health, and representatives of people with disabilities, social services, women and community members. This important step will facilitate the incorporation of the CBAs into the municipalities' development plans.

The implementation of climate adaptation strategies and approaches resulted in more than 2,261 people (544 in Burkina Faso, 1,075 in Ghana and 642 in Niger) drawn from USAID WA-WASH partners and stakeholders, community leaders and members, and local NGOs, trained on CVCA, CBA, and PSP. Accordingly, 26 community based adaptation plans (10 in Ghana and 8 each in Burkina Faso and Niger) were developed, validated at the community levels, and shared with local authorities. The CBA plans serve as an advocacy framework for stakeholders within the target municipalities for the integration of climate change issues into municipal development plans. In addition, 65 communities develop seasonal adaptation plans with community and district agencies and stakeholders as a result of PSP trainings.

As a result of the CBA trainings, some communities implemented the activities outlined in the adaptation plans, including livestock production through improved breeds, the establishment of community based extension agents and local veterinary service providers, as well as dry season gardening to supplement food production. Other households are constructing compost pits to produce manure for their farms as an alternative to chemical fertilizer.

Success story: USAID WA-WASH strengthens community resilience to climate change through community-based approaches

Eric Ouedraogo has been a farmer for years in Burkina Faso. As a follow-up to the several trainings he received on climate adaptation approaches and tools including climate vulnerability and capacity analysis (CVCA), community-based adaptation (CBA), and participatory scenario planning (PSP), Eric was selected to take part in an adaptation learning program (ALP) study tour in Ghana. As a result, he can now consider himself as a trainer, an organizer, and a climate change strategist. As a farmer, Eric considered this additional training as an opportunity to help members of his farmers' union be more resilient to climate change. Eric convinced the union to use the tools he learnt to develop their own adaptation strategies. He said "this time we have our own strategies to develop."



Eric Ouedraogo on his farm

In July 2015 his farmers union launched and provided 70 percent of the funding for a five-day training for national facilitators in CBA, CVCA, and PSP tools. The facilitators such as Eric are typically responsible for the training of thousands of farmers in best agronomic practices. With the support of two other resource people, Eric conceptualized, designed, organized, and facilitated the training. Eric's ideas are now in practice in the 13 regions of Burkina Faso and he plans to extend it to all provinces of Burkina Faso. For this, the participants of the training committed to train other facilitators (at least three people per province), conduct refresher sessions for the trained facilitators, advocate for the integration of CVCA, CBA, and PSP tools into the development plans of communities and municipalities, organize awareness workshops on climate change at the provincial and regional levels and to seek local and national partners, and assist communities in the implementation of their community development plans. By targeting leaders such as Eric, the Program established safeguards for the sustainability of its climate change activities.

Furthermore, the climate change adaptation strategy trainings were replicated by some organizations and partners in their respective project communities. One local NGO in Ghana, PRUDA, submitted a proposal to the local government in Ghana incorporating the CVCA and CBA methodologies.

With the CBA plans submitted to districts and municipalities, the local authorities committed to incorporate these community-led strategies into their current and future development plans.

5.1.2. Decision makers' capacity building/training on adaptation

USAID WA-WASH conducted a series of workshops to strengthen the capacity of policy makers on integrating climate risks and adaptation into water resource planning and management in the three target countries. The main objective was to ensure the mainstreaming of climate change into WASH policies and practices. Before USAID WA-WASH the target participants (the mayors, the directors of regional water departments, and the directors of the national companies for water supply and sanitation) were not involved in such initiative.

The trainings materials were developed by FIU in collaboration with Water and Sanitation for Africa (WSA), which also helped facilitate the workshops for the benefit of the water sector stakeholders. The trainings were conducted using an adult learning approach with interactive sessions. The participants were organized into groups according to various sub-sectors of water, sanitation and hygiene (WASH). They worked on successive sequences from vulnerability assessment to planning interventions taking into account climate risks, impacts and adaptation options. Each group discussion was preceded by an introduction given by the facilitators in a plenary session.

Throughout the life of the project, ten trainings sessions were conducted within the three countries including 5 in Burkina Faso, 2 in Ghana, and 3 in Niger. In order to enhance the sustainability of this activity, three refresher trainings were conducted in Burkina Faso (2) and Ghana (1). These refreshers focused on the development of plans to manage different water and sanitation systems in the context of climate change, sharing experiences implementing climate change projects and discussing challenges encountered after the first trainings.

The main challenge in conducting these capacity building events was the difficulty to mobilize legislators from the target countries. All attempts to gather parliament members and share with them the crucial issues on integrating climate risks and adaptation into development strategies, especially, into water resources management were not successful given their high solicitations at the national level and the requirements to pay them a sitting fee for participating in such events.

The trainings session on climate change reached 246 decision-makers and planners (224 men and 22 women) across the three countries including 131 in Burkina Faso, 47 in Ghana, and 68 in Niger. Out of these participants, 68 received a refresher training in Burkina Faso and Ghana. USAID WA-WASH also conducted email and field visits follow-up to determine how trainees applied the knowledge and skills they gained. Most of the trained stakeholders reported that they gained awareness which led them to change their attitude and behavior on issues related to climate change, including through energy and water saving, building infrastructure, environmental preservation and protection and tree planting. They also reported that they shared their knowledge with other people, sometimes through formal trainings. Others have organized sensitization campaigns, revised their local development plans to integrate climate change or assisted

communities to design climate proof projects. As a results of this activity, 3,396 stakeholders gained an increased capacity to adapt to the impacts of climate variability and change within the three countries.

National plans for climate change adaptation are currently being adopted by the different countries. They take into account key development sectors such as water, agriculture, environment, energy, etc. The trained decision-makers and planners by USAID WA-WASH are contributing to these processes. Most of the municipalities in Ghana and Niger are engaged in their mid-term planning or revision of development plans and they committed to consider climate change in the new documents.

5.1.3. Climate information for farmers

USAID WA-WASH signed an agreement with the Burkina Faso Meteorological General Directorate (DGM, in French) to train local farmers, from ten communities in Burkina Faso, on how to use climate and meteorological information in their agricultural decision-making. The agreement also aimed to disseminate climate information through local radio stations in order to reach a broader population. Before USAID WA-WASH, most of the farmers in the targeted area relied on their indigenous knowledge to predict and plan for the cropping season. The baseline study revealed that 72% of respondents were using these indigenous information although they agree that their traditional referential is seriously challenged by volatile climate patterns experienced as results of climate change.

The Program organized a two-day workshop in each of the ten target communities in the Centre, Centre-Ouest, and Boucle de Mouhoun regions. The main objective was to help the target farmers to better adapt to the adverse impacts of climate change and increase their crop production in a sustainable manner. The topics covered include sites climatology and their climatic constraints, climate variability and change, climate and weather predictions, agro meteorological products and their usefulness, the importance of rain gauges, and adaptation strategies to climate variability and change.

Five local radios were identified and engaged to broadcast periodic weather forecast information in local languages and in French. Monthly monitoring was conducted by the DGM technical staff to provide advice and to ensure an effective understanding of the climate information received by the farmers. These meeting were opportunities for the meteorologists to reinforce the initial training they gave to the farmers.

The local radios faced frequent power shortage that prevented them from broadcasting the weather information. This resulted in late diffusion of some bulletins. This challenge was address by using mobile phones when possible. Another challenge was related to the technical language used in the bulletins. Some bulletins were therefore difficult to translate into the local languages. As a solution, the radio referred to resource people who have extensive experience in the translation into local languages, and when possible they also referred to the agricultural technicians in the region.

A total of 1,181 farmers (673 men and 508 women) were trained on how to integrate climate information into their decision making (see Photo 31). To support this activity, the Program installed 20 rain gauges throughout the ten target communities and trained two volunteers in each community on how to read the rain gauges and report on a regular basis the rainfall data to DGM (see Photo 32). As part of the agreement signed with the five local radios to broadcast the climate information produced by DGM on a daily basis, 140 bulletins have been produced and disseminated. These data not only help for weather and seasonal forecast, but they are

also immediately used by farmers in their day to day decisions. The farmers reported they have saved time and money and they avoided losses by listening and integrating the weather forecast information broadcasted.



Photo 31: An agro meteorologist explaining the climate patterns in the Boucle du Mouhoun region (FIU, Burkina Faso, 2015)



Photo 32: A rain gauge monitor discussing with USAID WA-WASH Climate Change Coordinator in Tiogo-Mossi (FIU, Burkina Faso, 2015)

A new early warning project (SAP / IC), conducted by the Ministry of environment and fisheries of Burkina Faso may represent an opportunity to ensure the sustainability of this activity. Through the new project, the DGM will be able to provide climate and weather information to the community members using the model developed by USAID WA-WASH. Most community radio stations involved in this activity committed to continue the work beyond USAID WA-WASH.

6. FOOD SECURITY RELATED ACTIVITIES

The Program's achievements related to food security are summarized in Table 4.

Table 4: Food security related indicators status as of December 31, 2015

Indicator Number	Indicators	LoP target	Results as of December 31, 2015
IN.52	Number of farmers and others who have applied new technologies or management practices as a result of USG assistance	1,009	2,549
IN.53	Number of individuals who have received USG supported short-term agricultural sector productivity or food security training	3,137	5,855

The following activities were implemented in order to reach the targets stated above

6.1. WASH INTEGRATION TO ENHANCE FOOD SECURITY

6.1.1. BURKINA FASO

6.1.1.1. WASH-MULTIPLE USE SERVICES

As part of the MUS approach, livelihood activities are implemented to convert small family gardens into a year-round source of income, diversify livelihoods, create jobs, and increase the overall agricultural productivity. Through these activities, USAID WA-WASH intends to increase the resilience of the target populations by promoting income generating activities and the use of low-cost water technologies for productive activities.

According to a baseline study conducted in September 2012, rain-fed agriculture, livestock rearing, market gardening and small businesses were the main economic activities for households within the MUS communities in Burkina Faso. Producers practicing these activities had an average revenue of 16,200 FCFA (\$27.5) /month for rain-fed agriculture, 13,480 FCFA (\$22.8) /month for market gardening, and 5,990 FCFA (\$10.20) /month for animal husbandry. The rain-fed agriculture activities were hindered by an increased variability of rainfalls and temperatures and the Newcastle disease represented the main challenge for poultry production (responsible for 68% of poultry losses per year). Market gardening was practiced by 61.7% of households, but the lack of organization reduces the benefits of this activity.

Based on the baseline's findings, USAID WA-WASH selected four promising value chains to improve food security, nutrition and increase household revenue. These value chains included conservation farming, moringa production, local poultry raising, and market gardening (with a focus on the production of rainy season onion). The revenue generated by these activities also contributes to ensure the maintenance of the low-cost water points installed within the MUS communities.

As part of conservation farming activities, the Program trained and equipped 21 lead farmers with rippers, tape measures, and ropes. The lead farmers have trained in turn 488 farmers (453 men and 35 women) in conservation farming. Throughout the life of the project, 649 farmers (611 men and 38 women) have applied

the conservation farming techniques on their farms including those trained by local NGO partners AMB and OCADES.

For local poultry production, USAID WA-WASH trained 15 poultry vaccinators within the target communities. Equipped with vaccination materials, the vaccinators conducted cascade trainings for the water points' beneficiaries before proceeding to poultry vaccination in their respective communities. A small fee of 30 FCFA (\$0.05) per poultry, representing the cost of the vaccines, was paid by the beneficiaries and the Program contributed for 20 FCFA (\$0.03), representing the vaccinator fees. In order to enhance the sustainability of this activity, the Program linked a local NGO (ASUDEC), working in poultry raising, to poultry producers within the MUS communities. The support provided by ASUDEC included the monitoring of the work done by the vaccinators and technical assistance to poultry producers in order to reduce the losses due to diseases. Through these efforts, 414 poultry farmers (379 men and 35 women) received a training on improved techniques, and 223 of these farmers (210 men and 13 women) applied the techniques they learned.

USAID WA-WASH activities related to moringa production focused on working with women's groups and promoting an improved variety of moringa coupled with trainings on producing and marketing value-added products (moringa powder, dry moringa leaves, moringa pomade, moringa soap, etc.) to promote income generating activities and enhance the nutrition of target communities. USAID WA-WASH identified and promoted an improved variety of moringa (PKM1) purchased at ICRISAT in Niger. This variety produces three times more leaves and 10 times more seeds than the local variety in Burkina Faso. With the variety of moringa selected, the Program identified and trained 11 women's groups on moringa production and processing. These women conducted cascade trainings for the other women in their respective communities. A total of 414 women have benefited from the moringa production and processing training and 310 of these women applied the techniques they learned.

Market gardening activities focused on the production of rainy season onion. This activity started with the identification and training of nine (9) lead gardeners and the establishment of a formal link between the gardeners and a seed marketing company (Burkina Primeur) to facilitate the supply of improved seeds for rainy season (Prema 178). The lead gardeners trained in turn 816 other producers within the MUS communities and 377 of these producers purchased rainy season onions seeds and produced the improved variety in their gardens. The rainy season onions sells for three times the price of the onions produced during the dry season. This new opportunity allowed the beneficiaries to increase their income.

The non-subsidy approach promoted by USAID WA-WASH constituted the main challenge for food security activities within the MUS communities due to the fact that other project provide subsidies in the target area. For example, the rainy season onions farmers initially expected to receive seeds for free rather than purchasing them. In order to overcome this challenge, the Program place an emphasis on capacity building, supply chain development and marketing. With the promising results of the first applicants, the Program recorded an increased adoption of the technologies promoted the following years.

Conservation farming has led to significant increases in yields as showed by two independent evaluations conducted in 2013 and 2014 by the Ministry of Agriculture and Food Security. In 2013, a Significant yield increases have been observed for millet (+60%), sorghum (+134%) and maize (+170%). A total of 1,069 people from 87 households benefited from conservation farming activities during this year. In 2014, 330 additional producers including 304 men and 26 women received training on conservation farming. Out of the total number of farmers trained on conservation farming, 295 producers including 278 men and 17 women applied

the techniques on their farmland. Another survey conducted by the Ministry of Agriculture and Food Security confirmed the significant yield increases for millet (+151%), sorghum (+250%), and corn (+129%), etc., depending on the geographic area. The total quantity of cereal produced by 295 farmers includes 5.4 tons of millet, 58.5 tons of sorghum and 67.6 tons of corn. Over 3,050 people from 295 households benefited from the outcomes of conservation farming during this year. Farmers who applied the conservation farming techniques increased their yields and therefore improved their food security.

The Program also surveyed gardeners to gauge the revenue gained through the sales of rainy season onions. The study revealed that rainy season onion gardeners earned on average 151,125 FCFA (\$248) from an average garden area of 614 m². Previously, these gardeners were not able to grow onions during the rainy season. The incomes generated are mainly used to pay for schooling, healthcare, and purchase garden inputs for the dry season.

A study conducted with women's groups found significant incomes generated by moringa production and sales including fresh moringa leaves (\$71), dry moringa leaves (\$136), moringa powder (\$412), and moringa seeds (\$79). Other moringa products sold include: moringa soap and cream. These results demonstrate that moringa is a promising revenue generating activity for women (see Photo 33) in Burkina Faso, despite the fact that the major part of the production is directly consumed by households.

Success Story: USAID WA-WASH integrates WASH and food security

At 60 years old, Mrs. Pauline Kangoro is leading a movement in her village. Pauline heads a women group of 30 moringa producers and together they are raising moringa frenzy in their village of Koukouldi in the Centre West region of Burkina Faso. In 2013, USAID WA-WASH through Winrock International identified the married mother of four as a leader in her community for the production of moringa and sent her for training at the ICRISAT center in Niger along with a group of nine lead gardeners. A year later, Pauline was invited to the Ghana Permaculture Institute to learn how to process moringa for cosmetic uses

Thanks to the production and processing of moringa, Pauline became the "head of the household." Through trading moringa leaves, seeds and processed products including powder, soap, and ointment, she is able to meet many of the needs of her family. "Thanks to the project, my family has not known famine for two years and I have even just registered my son at the private college of Koukouldi for 72,000 FCFA," said Pauline. "Before the project, I would not have even dreamed of this enrollment." By sharing the costs with the USAID WA-WASH program, Pauline has even managed to improve the water points in her household for safe drinking water.



Pauline speaks to Voice of America and displays products during WFP US Ambassador's visit in Burkina Faso

Pauline plans to continue growing and processing moringa as an income generation activity with her women's group. Together, they will move from market to market in neighboring villages to promote moringa and different moringa-based products. So far, her perseverance and passion has paid off; in March 2014, she won first place in the "environment and sustainable development" category at the agriculture fair Agro of Tenado



Photo 33: Women's group demonstrating moringa production, processing, and products in Koukouldi (Winrock, Burkina Faso, 2015)

Another study conducted with poultry farmers revealed a reduction of losses due to diseases from 32.8% in December 2012 to 1.2% in March 2015. With the income gained from increased poultry production, beneficiary households have additional resources for the maintenance of water points and improved food security.

For better sustainability, USAID WA-WASH conducted all livelihood activities related to MUS with the support of community leaders who conducted cascade trainings for their respective communities and monitored the implementation of the activities beyond the Program. These community leaders were motivated by the income generated by their support (sales of rainy season onion seeds, vaccination of poultry, processing of moringa, etc.). Local NGO partners and government's technical agencies were also associated to this sustainability approach.

6.1.1.2. CLIMATE SMART AGRICULTURE

In December 2013, USAID WA-WASH introduced a climate smart agriculture activity in 10 communities in three regions (Centre, Centre-Ouest, and Boucle du Mouhoun) of Burkina Faso. In each community, focus group discussions were held to assess the level of the farmers' awareness of innovative techniques to address the effects of climate variations on rain-fed agriculture, as well as their willingness to adopt these techniques. In April 2013, a second visit was conducted jointly with DGM to explain the activity's objectives to the beneficiaries including traditional leaders and local officials. During this visit, baseline information was collected on the 20 farmers selected by each community to participate in the activity. This baseline study revealed a very low productivity of rain-fed agriculture and the annual harvest does not cover households' food needs in most of the communities. The same study showed that agriculture is traditionally practiced by 80% of the people in the community.

In May 2014, group leaders from the 10 communities were trained as co-facilitators for their communities. Each leader was tasked to identify a suitable farm in his/or her village that could be used to demonstrate the application of CSA techniques. A total of 201 farmers (156 men and 45 women) were trained during the first year of implementation (see Photo 34). Based on the positive outcomes of the CSA activity, 471 farmers including 312 men and 159 women were trained for the following rainy season. Out of the 471 farmers, 349 were attending their first CSA training and the others were receiving refresher training (see Photo 35).



Photo 34: A section of participants during the training in Moko (FIU, Burkina Faso, 2014)



Photo 35: A field demonstration for farmers in the village of Tiogo Mossi (FIU, Burkina Faso, 2015)

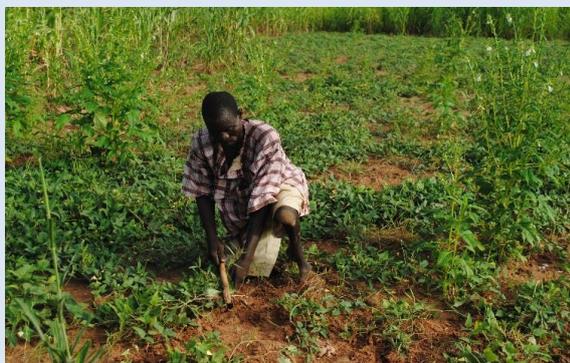
USAID WA-WASH also conducted monitoring visits to identify the farmers that applied CSA techniques on their farms (see Photo 36), document what techniques each of them applied and provide the farmers with technical assistance on agricultural practices.

The CSA activity started late during the first year of implementation. Some farmers started to plant before the beginning of the training. This situation reduced the number of applicants of the techniques promoted. The challenge was addressed during the second year of implementation by planning the trainings two months before the start of the rainy season. This resulted in an increased uptake from the target farmers.

Through the monitoring visits, the Program recorded 64 producers who applied the CSA techniques during the first year of implementation and 179 the following year. In November 2014, USAID WA-WASH conducted a yield evaluation for the target farmers (see Photo 37). Yields were estimated for three main groups of farmers: (1) trained farmers who applied the CSA techniques; (2) trained farmers who did not apply the techniques; and (3) untrained farmers who continued to apply traditional techniques. The evaluation results demonstrated the effectiveness of the CSA techniques adopted by the farmers. For instance, CSA sorghum farmers harvested 125 kg/ha more than their counterparts who used traditional methods only, and CSA corn farmers harvested 12 kg/ha more.

Success story: Promoting Good Agricultural Practices

In Burkina Faso, poor soil fertility, excessive rainwater runoff, and an uneven distribution of rainfall contribute to poor yields among subsistence farmers like Mr Sambo Kabore. Most farmers in Burkina Faso practice agriculture using traditional methods that impoverish the soil, so that they can no longer get good yields. Climate change exacerbates the vulnerability of these farmers and their families to food insecurity. Mr. Sambo Kaboré, 52 years old, is from the village of Koudié in the commune of Tanghin-Dassouri located about 30 kms South West of Oudagoudou. He is the head of a family of 11 members. He lives mainly on rain-fed agriculture that he practices on his field of about two acres. Physically challenged, he cannot stand on his feet. Unlike other people who in the same situation would engage in begging, Mr Kabore decided to take control of his destiny, he made farming his main activity.



Mr. Sambo Kaboré in its farmland in the village of Koudié

Every year, Mr. Kabore's plot production covers the nutritional needs of his family for six months. This insufficient production is explained by poor soil, excessive runoff and the poor rainfall. In 2014, Mr Kaboré joined a group of 20 farmers trained by USAID WA-WASH program on the use of climate information and agricultural production techniques for better adaptation to climate change and yields increase. At the end of this training, Mr. Kabore applied techniques learned on a portion (0.14 ha) of his field which, according to him, would not have supported the production of cereals such as sorghum, millet or corn that are the basis of the family staple food in Burkina Faso. Thanks to the techniques Mr. Kaboré applied, he was able to harvest 65 kg of sorghum on the 0.14 ha he used as a test plot. Glad to see that his land could be reclaimed for cereal production and feed his family, he decided to apply techniques learned on his entire field the coming seasons.



Photo 36: Measuring the height of corn grown on a CSA field in Oullo (FIU, Burkina Faso, 2014)



Photo 37: Yield evaluation in Vipalogho (FIU, Burkina Faso, 2014)

Some producers expressed the desire to get supported in terms of agricultural inputs and equipment which will help them implement the CSA techniques on larger land area. The Program advised farmers to organize themselves into self-reliance CSA groups so that they can access inputs through government services and private suppliers.

6.1.2. GHANA

6.1.2.1. WASH-FOOD SECURITY/NUTRITION LINKAGES STUDY; WASH-MULTIPLE USE SERVICES (A)

The dependence on rainfall represents a major constraint to the increasing agricultural production, malnutrition, and rural poverty in the Upper West region of Ghana, where the rainy season spans only over a four-month period. The vulnerability of rural people remains significant owing to the highly variable and erratic precipitations.

The USAID WA-WASH food security intervention was implemented in 10 communities of three districts in the Upper West Region. An initial assessment identified the challenges faced by farmers in agricultural production including the limited access to water for gardening and livestock needs, the non-existence of veterinary or animal health support services, the weak supply systems for access to inputs, credit, planting materials, and ultimately, marketing of the farmers' produce, and the limited access to agriculture extension services.

USAID WA-WASH implemented food security activities in collaboration with the District Agriculture Development Unit (DADU) of the Ministry of Food and Agriculture (MoFA). As part of these activities, the Program established and trained community-level structures including community based extension agents (23 men and 15 women) and community livestock workers (18 men and 18 women) in seven communities to enhance farmers' access to crop extension and animal husbandry services.

Furthermore, the Program established six (6) farmer field schools (FFS) in the target communities to enhance the skills of the community based extension agents (CBEAs) and farmers' practical agronomic skills. Over 148 farmers (71 men and 77 women) were trained through the farmer field schools. In support to this activity, a forum was organized for community members, input dealers and tractor service providers to discuss access to services and products at the beginning of the farming season.

To promote the multiple uses of water, the Program provided motorized water pumps, two (2) boreholes, and rehabilitated two (2) existing boreholes to 12 village saving and loan associations (VSLAs) in order to enhance domestic water use, animal husbandry, and dry season vegetable gardening. With the support of the Ministry of Food and Agriculture (MoFA), 193 producers (67 men and 126 women) started dry season vegetable gardening. These producers received a training on the operation and maintenance of pumps, efficient water use, canal irrigation, production techniques, plant nursing, transplanting, and weed control. A training in compost preparation and utilization to reduce the use of chemical fertilizers developed by the Program saw the participation of 87 producers (48 men and 39 women) from seven (7) communities.

The Program also launched the “pass on the gift” scheme with 225 beneficiaries (65 men and 160 women) to introduce improved sheep and goat breeds through the VSLAs with support of the community livestock workers (CLWs) and the Ministry of Food and Agriculture (see Photo 38).



Photo 38: Some beneficiaries of the 'pass on the gift' scheme (CARE, Ghana, 2015)

Some challenges emerged during the implementation of these activities. For instance, the period of introduction of good agronomic practices was too short to appreciate the rate of adoption by farmers. There was not enough time either to monitor the “pass on the gift” scheme. As a solution, the Program conducted a refresher training of all CBEAs for community members to refer to them for assistance to the agricultural extension services. In collaboration with the VSLA members, USAID WA-WASH designed a handing over of the gift plan showing the secondary beneficiary for each primary beneficiary. The CLWs and the VSLAs supervised this process.

Throughout the life of the project, 97 farmers (61 men and 36 women) adopted the improved techniques learned through the FFS on their farms including compost preparation, and fertilizer application (over 82 households constructed compost pits in their backyards as a way of minimizing use of synthetic fertilizers), 255 small ruminants were dewormed, 41 were castrated and 24 were bathed to control pests. The community livestock workers also gave injections to 45 sick animals with the guidance of the veterinary officers. Furthermore, the presence of the CLWs led to more readily available veterinary services, which have reportedly reduced livestock mortality rates. The 'pass on the gift' scheme coupled with the increased access to veterinary services is beginning to boost livestock production, increase community resilience, and improve food security.

The collaboration with village authorities and the work of male gender champions enhanced women's participation in WASH and food security across the target communities. As a result and for the first time, 430 women in 22 communities gained access to farm plots for crop cultivation.

USAID WA-WASH developed community structures and fostered strong relationships between community members, agricultural extension agents, and veterinary officers to facilitate the easy access to information and services. The trained CBEAs and CWLs are now in a position to provide basic extension and veterinary services to community members using the VSLAs as a platform.

Success story: Women gain access to land for farming

Dagne is a small farming community in the Lawra district of the Upper West region of Ghana, with a population of over 1,600 people. A gender analysis conducted by USAID WA-WASH in Dagne revealed that women's access to land for farming was a major problem in the community. Accordingly, the Program worked to educate and sensitize 10 rural communities including Dagne on the importance of and the need for women to have land to farm. The activity utilized various strategies including drama clubs, community meetings and engagement with male gender champions and traditional leaders. As a result of this campaign, more than 225 women from the 10 communities gained access to a total of 154 acres of land for farming. These women have cultivated crops including groundnuts, beans, soybeans, rice, pepper and tomatoes.

Mrs. Kuuyou Segkuu from Dagne is one of the beneficiaries of this intervention. This year, she cultivated about one acre of groundnuts and half an acre of beans for herself and she hopes to have a good harvest. According to Kuuyou Segkuu, "I am happy this year because I have been given one acre of land. I cultivated groundnuts and am going to have a good harvest. I will use the produce to support myself and pay for my children's education and also have some money to save in my village savings and loan association (VSLA). I hope you people will be back next year to educate and sensitize our men and husbands."



Kuuyou Segkuu harvesting her groundnuts in the Dagne community, Upper West region, Ghana

The women who have access to land to farm agree that this is a great achievement. According to them, the increased income from farming will allow them to support themselves and their husbands to buy food, pay school fees, pay health bills and save in their VSLAs. They expressed their gratitude to USAID WA-WASH for sensitizing and educating the men in their communities on the importance of women's land access, and they hope the Program will continue this important work.

6.1.2.2. WASH-MULTIPLE USE SERVICES (B)

In Ghana, USAID WA-WASH food security activities related to MUS focused on dry season gardening through the technical training of gardeners, the promotion of improved seeds, and the promotion of low-cost solutions to improve community's access to water for productive activities. In January 2015, a baseline study was conducted by the Program to identify appropriate communities and groups for the gardening activities. The main objectives of the study was to assess the level of experience in gardening, the seeds and techniques used, the most convenient technologies to improve access to water for productive uses, and the number of women's groups potentially interested in gardening. Although women were interested, they lacked the skills and faced water shortages that prevented establishing gardening activities. Two communities (Ko Gouri and Tantuo) were selected based on their motivation and willingness to learn. Since most of the visited communities were facing water shortages, the Program included in its activities the promotion of alternative low-cost solutions that minimizes water losses such as the BAC (plastic container) gardening technique.

In order to promote year-round income generating activities, USAID WA-WASH trained 44 gardeners (30 women and 14 men) from two livelihood groups in Tantuo and Ko Gouri in market gardening (see Photo 39). Through this activity, two vegetable demonstration plots were established in Tantuo and Ko Gouri with a size of 744m² and 325m² respectively. The participants' feedback indicates that none of the 44 trainees had previously practiced dry season gardening due to inadequate water supply, lack of experience, and the difficulty in getting fencing materials.

For women, gardening was a burden. They argued that having to walk long distances to fetch water for domestic and productive needs was prohibitive to any livelihood activity. Thus, the Program introduced dry season gardening through trainings on the 'BAC' technique. The 'BAC' gardening technique consists of: (1) building up "garden boxes" that are lined with plastic to minimize water loss; (2) planting in narrow rows; and (3) using mulch to minimize water loss through evaporation. This system requires less water, and reduces the competition for water between domestic uses and gardening, while simultaneously increasing yield through improved better production techniques (see Photo 40). The group gardens were placed near the water points to ease watering but also to serve as demonstration for the rest of the community.

With these new techniques, the gardeners planted local and exotic vegetables including pumpkins, alefu, bito beans, lettuce, tomatoes, and peppers. Their produce is sold at the local market and used for household consumption and the women expressed their satisfaction with their gardening activities. The members of the gardening groups also recognized that the training and technology have played an important role in ensuring better food security and improving income. As a result of this success, the groups are now prepared to continue and expand their gardening activities. The potential for BAC gardens seems significant as evidenced by numerous BAC gardens that other households have developed on their own without any direct project support.

In addition to the step mentioned above, the sustainability of the activities was also ensured by organizing an advocacy session conducted with District officials and officials from Ghana Education, Ghana Health Service, the Ministry of Food and Agriculture and local NGOs in WASH and Agriculture.



Photo 39: Preparation of vegetable beds for planting in Koh Guori, (Winrock, Ghana, 2015)



Photo 40: A woman in her group garden in Koh Guori (Winrock, Ghana, 2015)

6.1.3. NIGER

USAID WA-WASH conducted a baseline study in May 2013 to understand the context, current livelihoods activities, and the needs and aspirations of the population in the Zinder region. Community visits, focus groups and situational assessments were complemented with detailed surveys on the existing productive activities within the target communities. The results reveal that livelihood activities were hampered by the lack of access to agricultural inputs and financial services, the limited technical knowledge and the lack of technical support by existing government agencies and agricultural related institutions. This situation led to poor farm management, low yields and insufficient production to meet local and regional demand for key produce.

Based on the baseline findings, USAID WA-WASH identified promising livelihood activities with an emphasis on market gardening (onion, tomato, moringa and fodder maize production) and provided a support to local producers through the promotion of small-scale irrigation technologies, training of individual producers and producer groups, on-farm and exchange visits, and the promotion of locally adapted strategies in order to sustain income generating activities. To support market gardening activities, the Program organized a visit to businesses selling agricultural inputs in Zinder in order to create a relationships between input suppliers and the gardeners. A total of 67 producers (59 men and 8 women) participated in this visit, resulting in 750g of improved vegetable seeds purchased in addition to spare parts for treadle pumps.

Throughout the life of the project in Niger, over 847 producers (815 men and 32 women) and 636 students from five school gardens were trained on improved gardening techniques including nursery and vegetable garden bed establishment, transplanting, production techniques, and harvesting. The 32 women who participated in the initial training replicated the training with an additional group of 126 women from the six women garden groups. The trainings were conducted in collaboration with the local authorities and agricultural technical services. An agreement was signed with local government technical services to ensure the follow-up and monitoring of these gardeners.

Building on the results of previous MUS projects conducted by Winrock in Niger, the Program supported the local low-cost borehole drilling teams and pump manufacturers to establish and strengthen a demand-driven private sector approach for low-cost drilling and installation services. For this, the drilling teams and pump manufacturers conducted demonstrations of the proposed technologies within the target communities. As a result, 32 garden tube-wells and 13 treadle pumps, entirely funded by the beneficiaries, were sold by the trained water related enterprises. In addition, two traditional wells were rehabilitated (with significant contribution from community members) to improve access to water for productive uses. An impact assessment of the treadle pumps and low-cost garden tube-wells showed that 55% of the farmers who had installed low-cost garden wells equipped with treadle pumps increased the garden area they cultivated by 26% on average, primarily due to the labor savings. Additionally, 27% of the producers were completely new to market gardening and they began gardening only after the purchase of a pump and/or a tube-well. These new producers cultivated cabbage, tomatoes, onion, potato, maize, sorrel, squash, peppers, watermelon, melon, okra, cucumber and chili on an average garden size of 1,890m². The additional income generated by this activity is generally used for food, fencing gardening plots and purchasing small gardening tools. Furthermore, the beneficiaries were satisfied by the cost of the pumps (30,000 FCFA or \$50) and the easy operation and maintenance (O&M) of the technology as compared to expensive motorized pumps that require fuel and high maintenance costs. With the tube-wells, the beneficiaries saved the time and expenses associated with maintaining a hand-dug well, as traditional wells require several re-digging throughout the year due to frequent collapses.

Success story: Promoting improved gardening techniques in Niger

Prior to USAID WA-WASH, women producers in the target communities of the Zinder region of Niger encountered challenges related to access to agricultural inputs, financial services, and technical knowledge. Gardening is traditionally a male-dominated activity. The Program through Winrock supported six women demonstration gardens and five school demonstration gardens to stimulate women and children participation in gardening activities. As part of this support, each demonstration garden received two treadle pumps and one tube-well and the target gardeners were trained on improved gardening techniques. The Program's beneficiaries derived tangible benefits from this support including improved technical skills in market gardening, increased income, savings in labor and time spent on irrigation that can be spent on other economic activities, increased food production for local markets and improved nutrition.



Mariama Bounia (brown shirt) during a training in improved gardening techniques

Mariama Bounia is a member of a women's gardening group in the village of Barago. Mariama affirmed that gardening has improved her family's dietary choices with foods that are rich in important nutrients for pregnant and nursing women and children. In addition, the women were able to sell their gardening produce in the village earning. Through these sales, they earn 30,000 FCFA (~\$60) per year on average. The income generated is sometime save in village savings and loans association (VSLA) established with the support of USAID WA-WASH. "We are very proud to have learned of this gardening activity" said Mariama. "For us, this was an activity which was reserved for men. In addition, this is the first time that we have seen and used a gardening tubewell and a treadle pump. Otherwise, we would be obliged to manually haul water from a shallow well or a pond to practice gardening." The tube-well and the treadle pump allowed women like Mariama to spend time on meeting other family needs, while practicing gardening and saving money.

The treadles pumps and tube-wells for women groups and school were given as a subsidy by the Program for demonstrations. Accordingly, 24 treadle pumps and 12 tube-wells were installed in six (6) women gardens and five (5) school gardens within five communities (see Photo 41 and Photo 42). In each of the selected community, the women groups (approximately 21 women per group) negotiated and obtained a suitable gardening site for five years and they were issued “a land tenure deed” signed by the donor and the president of the local MUS committee.



Photo 41: A school garden in Biri (Winrock, Niger, 2015)



Photo 42: A women garden in Barkonogie (Winrock, Niger, 2015)

Previous experiences in Niger showed that there is a tradition of livelihood diversification and farmers are involved in several economic activities at any given time of the year. Therefore, investments in tube-wells and treadle pumps might represent an increased economic risk in the short-term given that the investments are not spread over multiple income-generating activities. Furthermore, some farmers consider motorized pumps as “modern” and they intend to follow this pattern in order to comply with social norms even though these pumps are expensive. Despite these challenges, there is a tremendous opportunity to continue livelihood activities in Niger in order to improve food security and income of the local population.

7. Capacity building related activities

The Program's achievements related to capacity building are summarized in Table 5.

Table 5: capacity building related indicators status as of December 31, 2015

Indicator Number	Indicators	LoP target	Results as of December 31, 2015
IN.18	Number of NGO/local/national/regional governments that benefit from capacity building interventions	201	418
IN.35	Number of people receiving training in WASH as a result of USG assistance	2,211	4,354
IN.37	Number of WASH modules (group modules, etc.) developed by academic institutions	6	3

The following activities were implemented in order to reach the targets stated above

7.1. Assessment/Diagnostic of Regional Institutional Capacity and Potential in the WASH Sector

USAID WA-WASH conducted a human resource capacity assessment in the WASH sector in the three intervention countries (Burkina Faso, Ghana, and Niger). The assessment aimed to determine the number of staff, their qualifications and their experience to meet the Millennium Development Goals (MDGs) and universal access to water and sanitation services. Specifically, the assessment aimed to: (1) estimate the 2015 population in each country based on the last population survey and growth rate; (2) determine the WASH actual coverage (potable water and sanitation); (3) calculate the human resources (HR) capacities needed to achieve the MDGs' and universal coverage; (4) estimate the human resource demand according to type of service delivery for 10,000 people; (5) determine the existing human resources capacity in each of the country (number and competences); (6) evaluate human resources needed until 2015; and (7) calculate the human resource gap.

In Burkina Faso, the rate of access to drinking water was estimated at 57% in rural areas and 75% in the urban areas (PN-AEPA progress report 2010) and sanitation services were 1% in rural areas and 14% in urban areas in 2010 (national survey on households access to sanitation facilities 2010). Financial investment in Burkina Faso's human resources and in the water supply and sanitation services were limited. The public sector employed 81% of the existing human resources in the water supply and sanitation sectors, non-governmental organizations (NGOs) and community-based organizations (CBOs) employed 11% and the private sector employed 8%.

Burkina Faso has a significant human resources deficit in terms of numbers and skills set in all the water supply and sanitation employment fields. The human resources deficit was directly linked to the geographical spread of the population. Human resources needs were acute in the rural areas where the population is large and sparsely distributed. In addition, the lack in both the numbers and the skills of the human resources in the water supply and sanitation sectors was directly linked to the relatively low financial capacity of organizations to recruit and retain staff.

In Ghana, the rate of access to drinking water was 86% in 2010, surpassing the MDG goal of 80% by 2015. However, the rates of access to sanitation was 14%. The sanitation sector was institutionally fragmented and was constrained by inadequate budgetary allocations. There were more engineers and graduates in water supply than in sanitation. In addition, there was institutionalized training for technical artisans and operators for urban water supply, while there was no institutionalized training of water operators and latrine artisans for rural WASH service delivery. The key challenge that the sanitation sector faces is the inadequate professional personnel, especially sanitation engineers and technical staff. Public sector faced the highest shortages as the government limits the number of personnel employed per year. The service conditions in the public sector were not attractive enough to draw to the WASH sector the right caliber in certain category of personnel (civil, mechanical, electrical, and computer engineers). The stigma that is associated with the management of human waste is also a problem for the sector.

In Niger, the rate of access to sanitation was 38.4% in urban areas and 6.7% in the rural areas according to the estimates of the National Water Program in 2010. Similarly access to water was 73.8% in the urban areas and 64.4% in the rural areas. In addition, the rate of literacy was 28.7% which has a direct impact on human resources development. There was a deficit of human resources in the water and sanitation sector, particularly engineers working at the regional and departmental levels, because the majority worked at the central level. In addition, the HR competency and capacity to work in sanitation and hygiene, particularly in the dispersed rural areas were inadequate.

The results of the assessment of regional institutions showed that there was a general lack of hygiene and WASH focus in public-sector institutions at the regional and departmental levels, particularly in the health directorates. Further, the training institutions did not have facilities such as equipment and laboratories for training specialists in the water and sanitation sectors. The study findings showed that 70% of the water and sanitation engineers are trained abroad. There was inadequate employment opportunities in the water and sanitation sector and limited opportunity for self-employment. The young graduates were not sufficiently integrated into the sector. There were private operators working in the wastewater sector but there were no regulations governing service providers in the WATSAN sector and commercial companies often competed with NGOs.

7.2. Capacity building of regional WASH institutions

7.2.1. Academic institutions

The goal the training of trainers' activity was to enhance the didactic skills of the faculty and to create one general module for WASH that can be used in all universities and one group work module for each university focusing on local water, sanitation and hygiene issues. As part of this activity the USAID WA-WASH Regional Office conducted in collaboration with the University of Ouagadougou a survey of all WASH related courses taught at the University of Ouagadougou to inform UNESCO-IHE trainers before the development of the training program.

The first training of trainers took place from May 22-29, 2013 in Tamale, Ghana. The event was hosted by the University of Development Studies. The training was attended by 14 staff of the University of Ouagadougou (Ouagadougou), 2iE (Ouagadougou), University of Bobo-Dioulasso (Bobo-Dioulasso), Université Abdou Moumouni (Niamey) and the University of Development Studies (Tamale). Some participants were experienced teachers, while others were at the beginning of their teaching career. The focus was on improving teaching materials and teaching skills.

After the training, the participants expressed that creating one WASH module for all university partners may not be very useful. Therefore it was decided that future efforts will focus on the principle of setting up a module (according to the learning triangle of materials – learning objectives – assessment) and to share all materials available from UNESCO-IHE and the other partners. This new approach will allow each university partner to “shop” the pool of existing teaching materials and shape them in a way that suits their curriculum.

The second training of trainers’ workshops was carried out from March 10 to 13, 2014, in Ouagadougou, Burkina Faso. Eleven faculty members from Burkina Faso, Niger and Ghana attended the training, which built on the results of the first workshop. The training included a visit to 2iE research facility to discuss sanitation approaches (see Photo 43). The participants now form a network of local university teachers in the WASH sector, allowing them to easily exchange materials and cooperate in research and capacity building projects. A complete module on decentralized water supply and sanitation was made available to all participants on the UNESCO-IHE e-learning platform so that the universities have access to materials to create their own WASH module.



Photo 43: Study visit to 2iE research facilities with an introduction by two PhD students of their research on pro-poor sanitation (UNESCO-IHE, Burkina Faso, 2014)

As part of the capacity building collaboration with USAID WA-WASH, the University for Development Studies (UDS) in Tamale, Ghana has requested support for the preparation of a new MSc degree in WASH to be offered at their university. In February 2015, a week-long workshop was conducted to discuss the content of the program, its name, and its target audience and accreditation rules. Waste management engineering and environmental and sanitary engineering were selected to constitute the main content of the program. The main objective of the new MSc degree program will be to broaden the expertise of young graduates in development, design, operation, and management of innovative environmental technologies and infrastructure for water supply, recycling and reuse of waste and sanitation. Discussions are underway to finalize the development of this program.

Another workshop was organized on May 20-22, 2015 on waste management and resource recovery in Tamale, Ghana. Beside this event that brought together 14 WASH lecturers, a stakeholder meeting was organized to see whether there is a need for holders of a master’s degree in the field of water sanitation and hygiene. The waste management and resource recovery training had as an underlying principle that waste management increasingly is not only treatment, but rather aimed at resource recovery. This training challenged the participants to change their thinking on 'waste'. Moreover, it aimed at equipping them with skills to analyze materials or resource flows through various sector of the economy (industry, agriculture,

households). These skills are to be applied to various types of used-resource, commonly named wastewater, fecal sludge and solid waste.

Finally, the Program conducted on July 27-31, 2015 a training of trainers for a large number of faculty from the University of Ouagadougou. The goal of the training was to teach a relatively unexperienced group of faculty useful didactical skills. The trainers spent one week with the 64 participants going over different teaching elements with practical exercises and learning experiences.

The Program did not meet its objective to develop six WASH modules within the three countries because the participating universities in Burkina Faso decided not to pursue module development. Only 3 out of 6 modules targeted have been completed.

7.2.2. High-level Capacity Building (Intra-Regional Institutions)

USAID WA-WASH provided technical, organizational, and financial support to the third annual High Level Forum on water and sanitation for all in Africa, held in Abidjan, Côte d'Ivoire from November 21 to 23, 2013 (see Photo 44 and Photo 45). The theme of the forum was promoting a vibrant and effective south-south cooperation to accelerate access to water and sanitation for all in Africa. The forum brought together 508 participants including ministers, high level government representatives from Africa, regional and international institutions, the private sector, civil society organizations, development partners, academia, and the media. The Forum offered an opportunity for USAID to showcase its programs in the region through an exhibit, roundtable with the ministers from Burkina Faso, Ghana, and Niger, a one-hour TV debate on water and sanitation issues carried out by the Cote d'Ivoire national TV station. In addition, USAID Regional Environmental Director gave a speech at the opening ceremony. Conclusions and recommendations included: strengthen South-South or North-South cooperation; explore innovative sources of finance, even if of a commercial nature, that can support the implementation of large scale projects that provide quality services; advocate for more support to the fund for water and sanitation initiatives (SF/WSI) with all African governments; look beyond piecemeal approaches and explore more innovative and financially sustainable approaches, including private participation and business models; promote knowledge sharing and capacity development in water and sanitation.



Photo 44: USAID delegation with ministers of water from Burkina Faso, Ghana and Niger (FIU, Cote d'Ivoire, 2013)



Photo 45: A section of participants during the forum (FIU, Cote d'Ivoire, 2013)

From February 12 to 14, 2015, the Ministry of Agriculture, Water Resources, Sanitation and Food Security of Burkina Faso, organized the 2nd National Water and Sanitation Forum with technical support from USAID WA-

WASH by participating in the ad-hoc commission set-up to prepare the TORs of the forum and subsequently the participation in the resources mobilization commission. While USAID did not contribute financially to the forum, the efforts of the USAID WA-WASH Regional Director coupled with those of some members of the commission lead to the mobilization of over \$300,000. In addition, USAID WA-WASH provided support to the Forum’s technical secretariat via interns. The theme of the forum was “sustainable access to water and sanitation for all by 2030: strategies, practical solutions and stakeholder commitment.” This national event brought together 650 participants including 150 women from water agencies, governmental authorities, NGOs, national and international associations, financial institutions, universities, and user associations (see Photo 46 and Photo 47). Several water and sanitation related issues were discussed and the main recommendations included the development of appropriate laws on the right to water and sanitation, community empowerment to advocate for their rights to WASH services, strengthening the capacity of municipalities to conduct water and sanitation related programs, scale-up the leader led total sanitation approach as part of post 2015 sanitation programs promote the professionalization of sanitation related businesses, the establishment of baselines on water quality at the national level, monitor drinking water quality especially in rural areas, and promote water accounting at the national level. The last four issues were recommendations made by USAID WA-WASH based on lessons learned during the implementation of the Program.



Photo 46: Dr. Lakhdar Boukerrou foreground introducing the USAID WA-WASH staff to the Ministry of Agriculture, Water Resources, Sanitation, and Food Security during his visiting of the USAID WA-WASH stand (FIU, Burkina Faso, 2015)



Photo 47: Family photo of the officials during the forum (FIU, Burkina Faso, 2015)

7.3. Foster a professional WASH workforce

At the beginning of its activities, the USAID WA-WASH Program conducted a study on human resources gaps in the WASH sector in Burkina Faso, Niger, and Ghana (see section 7.1). This study showed that to achieve the Millennium Development Goal in the WASH sector, these countries need more human resources in terms of numbers and qualifications. Considering the gaps in human resources in the WASH sector, the USAID WA-WASH Program (through Florida International University) has taken the initiative to invest in capacity building as a way to strengthen the WASH human resources capacity.

These capacity building activities includes training of students and young graduates through professional internships; graduate scholarships for students pursuing advanced studies and applied research related to the

Program's thematic areas; training of trainers from trade schools to develop their teaching capacity; and the development of the staff of decentralized institutions through study tours to the USA.

The USAID WA-WASH internship program aimed to give an opportunity to young graduates from academic institutions in West Africa and elsewhere to acquire the necessary experience. It has particularly contributed to enhance the skills, confidence, and employability of graduates and young professionals. During the course of the program 153 interns (56% male and 44% female) have interned with the Program in various fields including WASH, food security, climate change, gender, project management, monitoring and evaluation, public relations/communication, capacity building, administration, information technology, and accounting and finance. These interns represent 13 countries and 32 universities. Some of these interns (9) were eventually hired by the Program Regional Office and implementing partners. Others have found jobs with other local or international NGO's and government institutions or have started their own business while other are continuing their quest for a higher degree.

USAID WA-WASH Program has also developed a scholarship program for students enrolled in six universities in Burkina Faso, Ghana, and Niger. This program aims to provide funds to Master's students in fields related to the USAID WA-WASH thematic areas. Therefore USAID WA-WASH has granted 72 scholarships to 60 students to pursue a Master's program. Student's thesis are shared on the USAID WA-WASH website (<http://wawash.fiu.edu>) for consultation by the public. These theses will contribute to stimulate the research sector in order to find solutions to the problems of lack of access to water and sanitation, food

Success story: USAID WA-WASH scholarship recipients graduate from AGRHYMET Regional Center

Mrs. Nafissa Bertin and Mr. Damien Ouattara are among the USAID WA-WASH scholarship recipients who successfully completed their Master's program. Due to their excellent academic performance and outstanding research contributions, they were ranked at the top of their class at AGRHYMET. Damien's thesis focused on analyzing farming households' resilience to droughts in the province of Zondoma in Burkina Faso. His analysis allowed him to propose a resilience index and a methodology for its estimation, as well as to identify the variables affecting the adoption of resilience strategies by farming households in the province of Zondoma in Burkina Faso. Nafissa's research work was entitled, "Development of a climate index and analysis of the likelihood of small producers subscribing to crop insurance: A case study of the Say department in Niger." The main objective of this study is to contribute to the development of index-based crop insurance schemes as a tool for climate risk management and food security in Niger. Her results reveal that despite farmers' unfamiliarity with crop insurance, they demonstrate a great interest in subscribing to such schemes.



Mrs. Nafissa Bertin receiving her scholarship certificate

The scholarships provided by USAID WA-WASH made this dream possible for them as well as the other three USAID WA-WASH scholars. According to Mahamadou Aminou Sani Ibrahim, one of the other USAID WA-WASH scholars, "Getting this degree would not have been possible for me this year. Maybe, it could have happened after saving for three or more years. This scholarship has helped me gain important knowledge to serve my country, Niger. It has opened new doors for me such as the possibility of pursuing a Ph.D." The students trained by AGRHYMET and USAID WA-WASH are now well equipped to help their countries cope with the impacts of climate change. Since graduation, Damien has returned to the Ministry in charge of Agriculture in Burkina Faso. He is also pursuing a PhD in Economics at the University of Ouagadougou. Nafissa has joined the national council for the environment and sustainable development in Niger as a specialist in climate change.

insecurity, adaptation to climate change which have a major negative impact on people's lives. In Burkina Faso, the Program was able to obtain a matching contribution of \$100,000 from the National Lottery of Burkina (LONAB in French) to fund the scholarships offered to the Burkinabe students.

Twelve participants from Burkina Faso and 10 participants from Ghana took part in study tours on water resources management in Florida in February 2014 and September 2014 respectively. The participants attended lectures at FIU and learned from the U.S experience in water management from institutions such as the South Florida Water Management District, the Miami-Dade Water and Sewage Department and the Florida Department of Environmental Protection. After this experience, the groups identified areas for follow-up in order to improve the functioning of their institutions and continue to build their capacities. As a result, the Program organized training in GIS and climate change modelling to the benefit 12 technicians from the Burkina Faso water agencies and the Ministry.

Two pedagogical capacity building workshops geared to improve the quality of teaching in professional WASH schools in Ghana and Burkina Faso were organized in 2015. The workshops involved 19 instructors from the three Schools of Hygiene in Ghana (Accra, Ho, and Tamale) and 20 instructors from Centre des Métiers de l'Eau (CEMEau in French) in Burkina Faso. At the end of the training, the participants designed individual work plans that aim to help them implement the newly acquired knowledge in the short-, medium- and long- term.

Although training sessions were conducted successfully, follow-up remains a challenge to sustainability. In fact, while the desire to use the knowledge gained is great, it is difficult for some participants to successfully implement the knowledge acquired or their action plans after workshops. The bureaucratic nature of the environment where they work often makes implementing changes very difficult. To address this challenge the Program tries to engage the same or different people from a given organization into different activities. This strategy helps to remain in contact with participants and to build stronger relationships with the organizations.

In a context with large youth population and high unemployment, and where opportunities for youth are scarce. Thus, the majority of interns trained by the Program still have to take additional internships or pursue additional degrees before they are employed. However, the Program encourages interns to network among themselves but also with local organizations as they participate in events such as workshops, field visits and conferences. Sessions to improve their technical and administrative skills are held on a regular basis at the Regional Office.

USAID WA-WASH has contributed to raise many students and young professionals' interest and knowledge about the WASH sector through its internship and scholarship program. Former interns have created a Facebook Page called "FUI USAID WA-WASH Alumni's" to allow them to stay in touch, to share opportunities and experiences. Similarly, scholarship recipients in Burkina Faso and Niger have been encouraged and formed associations in their respective countries which aim at promoting water, sanitation and hygiene for better livelihoods in their country. The association in Burkina Faso is registered as "Reseau WAY-WASH" and in Niger the students' association is registered as "Bafouney-Hanno". These organizations were started with the leadership from and initiative of former interns.

Future investment HR in capacity building should focus on the issue of job creation and entrepreneurship in an effort to create more opportunities for the growing skilled workforce. This skilled workforce has the potential to contribute to address many of the development problems in West Africa. Institutional capacity

building is also one area that needs to be strengthened for better governance of the water and sanitation sector.

7.4. WASH governance training

Governance is a process which aims to improve the livelihoods of the population, reduce poverty and increase the chances of sustainable development. In developing countries, particularly sub-Saharan Africa, one of the greatest challenges in the water and sanitation sector remains the significant gap between the development policies and their implementation. There is still no single good governance model, but there are a number of factors that must be addressed in order to improve governance. One of the key USAID WA-WASH activities is the capacity building of decision makers and planners to promote good governance in the water, sanitation and hygiene (WASH) sector in Burkina Faso and Ghana.

The USAID WA-WASH activity built on the work already completed under CapWASH, a USAID Washington funded project implemented by FIU for the development of a WASH governance training program. The Program used the training manual and approach developed by CapWASH in implementing this activity. The main objective of the sessions was to equip WASH sector decision makers with the tools necessary to improve WASH management and WASH service delivery in their respective communities. The workshops served as a framework to equip participants with the tools and methodologies of work to promote good WASH governance in different contexts as well as a framework for sharing and building capacity to improve funding, institutional policy and local WASH regulations.

Participatory techniques were employed to facilitate the workshops. These included presentations, plenary discussions, group work and a field trip. These were interspersed with ice-breaking activities to keep the session alive throughout the workshop periods. The participants engaged in fluid and fruitful discussions throughout the sessions.

Field visits were conducted for each of the training sessions to provide the participants with a practical framework to discuss challenges related to good WASH governance in rural communities (see Photo 48). The main challenges identified by the participants in both countries include the lack of qualified human resources for designing and implementing programs including monitoring and evaluation of services and insufficient financial resources.

Throughout the life of the project, nine WASH governance training sessions were conducted for the benefit of 267 people in Burkina Faso, Ghana, and Niger. The participants included representatives from municipalities, Ghana parliament, ministries of water and sanitation, environment, and health NGO's, Water Directorate, the journalist network, ministry of, ministry of Health, community based organizations, private companies in the WASH sector, and national water and sanitation agencies. Follow-up was conducted with the participants of past training sessions and promising results were recorded. For instance, a former mayor of the commune of Tougan replicated the



Photo 48: Field visit in the village of Gayeri (FIU, Burkina Faso, 2015)

training to 80 members of the city council and 200 members of an association he created in 2012 for the development of the municipality of Tougan. As a result, 60 household latrines were constructed within this municipality a result that can be directly attributed to the training provided by USAID WA-WASH.

7.5. Regional WASH knowledge management / information sharing / monitoring and evaluation (M&E)

7.5.1. Managing knowledge within USAID WA-WASH and beyond; Knowledge Management Platform

The knowledge management component of the Program was managed by IRC through Y2. With sustainability in mind, USAID WA-WASH sought for a regional WASH organization that could continue these activities beyond the Program. Unfortunately, knowledge management activities have only resumed in late Y4 with the African Water Association (AfWA) after the management challenges faced by the initially selected organization (Water and Sanitation for Africa). The sections below detail the achievements made by partner IRC.

The WASH international NGO platform was established in 2011 to enable WASH project implementers to learn from each other and improve their practices in supporting the delivery of sustainable WASH services. A workshop on this platform was organized and facilitated by IRC in October 2012. Fourteen international NGOs engaged in discussions on how to enable communes to improve service management. Because all participants are involved in on-going WASH projects, this platform provides a good opportunity to get and give feedback on innovative approaches and continue the learning process.

The Program through IRC also supported and facilitated with GIZ a workshop with DGRE on the monitoring of rural water service management. In preparation for the 2013 annual sector review, the public working group dedicated to support to communes for water service provision (Cadre Partenarial) organized with the support of USAID WA-WASH a national workshop to share experiences on the support provided to communes to implement water reform. The workshop took place from February 13-14, 2013. Some USAID WA-WASH partners participated in the workshop.

Furthermore, USAID WA-WASH participated in the annual sector review to improve rural water service monitoring. Currently, rural service monitoring consists of an annual update of functionality of hand pumps and inventory of new water facilities. USAID WA-WASH attended the workshop to advocate for the improvement of rural water service monitoring. As a result, the Ministry of Water, Hydraulic Facilities and Sanitation committed to improve the monitoring of rural water service based on the project research outcomes. This policy improvement has been formally adopted in the final agreement of the sector annual review and signed by the Minister of water as sector priority for 2013.

In support to these activities, USAID WA-WASH through FIU established a knowledge management platform including three main application: (1) the content management system which compile general information on the Program (objectives, partners, staff, etc.), news and events related to the Program activities, photos and videos galleries; (2) the project management system which outline the Program implementation strategy, intervention areas, indicators' status, GPS coordinates of constructed infrastructures, etc.; and (3) the publication module designed to support documents sharing and retrieving.

7.5.2. Integrated WASH Knowledge Management (KM)

As part of USAID WA-WASH efforts to promote knowledge sharing, a KM portal was developed with the support of FIU Miami. This platform is being progressively handed over to the African Water Association (AfWA) with the objective that the organization becomes a knowledge management and information sharing repository.

7.5.3. National and regional knowledge sharing workshops

Major national and regional events were organized by USAID WA-WASH to either build the capacity of WASH stakeholders or advocate for the replication of the WASH technologies and approaches introduced by the Program in the three target countries. Some of these events are detailed below.

7.5.3.1. Water Information Summit

The 13th Water Information Summit (WIS XIII) was organized by the Regional Office and held April, 11-13, 2012 in Ouagadougou. It gathered information specialists, web site managers, scientists, policymakers, and other stakeholders, to discuss the regional perspectives on water information, to present and discuss case studies of the implementation of international, national, regional, and local water information systems and to examine the use of the Internet to disseminate water information. The event was organized by FIU in collaboration with the Water Web Consortium, under the sponsoring of US Embassy to Burkina Faso and the patronage of the Minister of Agriculture and Hydraulics of Burkina Faso. The Summit permitted to exchange experiences from several regions of the world (speakers from Kenya, Mexico and Brazil made presentations). More than 15 speakers presented communications related to the issue of water information.

At the national level, some challenges were described during various sessions: the insufficiency of human and financial resources, the lack of synergy in information management, the late release of functioning budgets, the inadequacy of water resources monitoring procedures as well as vandalism acts on monitoring equipment and tools in some cases. Participants recommended among others: (1) more implication of governments and regional institutions in water resources management; (2) the use of modern information technology and communication strategies in collecting and disseminating water information; (3) the exchange of water information among sub-regional institutions; (4) the sensitization of populations and (5) the development of collaboration programs between partners of the sub region and others from the rest of the world.

7.5.3.2. Regional learning and training on water accounting

MUS is an innovative and holistic approach for sustainable water delivery that seeks to provide water services reflecting the multiple water needs of poor households. As a client-oriented approach, MUS takes people's multiple domestic and productive water needs as the starting point to plan, finance, and manage integrated water services. Compared with single-use water services, MUS generates more income and benefits for people in target communities, and it increases the sustainability of water services. Prior to the implementation of MUS activities, the Program conducted water accounting surveys to estimate the water needs, existing water sources and water gaps between estimated needs and existing resources.

USAID WA-WASH organized two workshops on water accounting including a workshop to introduce the water accounting methodology to three local NGOs partner (Barka Foundation, AMB and OCADES) as part of MUS

extension in Burkina Faso and a regional workshop to strengthen and improve the water accounting methodology.

The first workshop, held on October 21-23, 2014 in Koudougou, covered data collection using mobile devices, data processing and analysis, and report writing. The workshop brought together 13 participants (9 men and 4 women) from local NGOs partners. As a result, the local NGOs partners conducted water accounting in 10 communities including three for Barka Foundation, four for AMB, and three for OCADES.

The regional workshop on water accounting, held on July 6-7, 2015 in Koudougou, brought together 29 (20 men and 9 women) participants of 13 organizations from Burkina Faso, Ghana, Niger and the United States to share experiences and discuss potential improvements to the water accounting methodology (see Photo 68). The main objective of the workshop was to draw lessons learned from the use of the water accounting approach in Burkina Faso, Ghana, and Niger in order to improve and/or simplify the current methodology and inform future programming. The Program also benefited from similar experiences conducted by Virginia Tech, IRC, and Akvo. The participants recommended the use of data visualization tools when sharing water accounting results with communities and decision makers. Other specific recommendations to improve the current methodology include providing more details on local maps and providing a web-platform with the ability to access offline data.

7.5.3.3. Climate change adaptation forum

USAID WA-WASH supported community members, associations, non-profits organizations, academic institutions, private sector actors, and local, regional and national governments to develop and implement climate adaptation strategies. Using a package of tools (CVCA, CBA, PSP, etc.) and techniques (weather forecasting, conservation farming, climate smart agriculture.), the Program increased the capacity of thousands of stakeholders at all levels to deal with the effects of climate change. In order to share this experience and help foster the development of community based adaptation strategies, USAID WA-WASH organized a climate change adaptation forum on May 4-5, 2015 in Ouagadougou, Burkina Faso.

The forum was designed around four main topics including community planning, climate information, rain fed agriculture and diversification of livelihoods for resilience. Twenty (20) participants (17 men and 3 women) gave presentations on a number of selected topics. The forum brought together 116 participants (95 men and 21 women) from USAID WA-WASH implementation partners, community members, national government of Burkina Faso, Ghana, Niger and other West African countries, regional and international development institutions, regional organizations working in climate change, etc.

The main recommendations from this regional event include the integration of climate change into national projects and programs monitoring and evaluation system, strengthen the integration of climate change issues into sectorial policies, ensure synergy between organization implementing climate adaptation activities, improve local level knowledge on climate change issues, provide equipment and human resources to the municipalities for the collection and dissemination of weather information.

7.5.3.4. Water technologies conference

From May 11 to 13, 2015, USAID WA-WASH organized a water technologies conference, in Ouagadougou, to showcase a variety of water technologies promoted by the Program and other WASH sector actors in West Africa, and advocate for additional donor investment in innovative, sustainable and appropriate water

solutions for Burkina Faso, Ghana, and Niger. The conference brought together 137 participants from state actors, professionals, sub-regional institutions, civil society, international NGOs, youth networks, technical and financial partners, the media, and educational and research institutions.

The conference was organized around six thematic sessions on different aspects of water technology. The sessions include: (1) sharing experiences in innovative technologies for managing water service delivery in rural areas; (2) roundtable discussion on household water treatment technologies; (3) promotion of low cost technologies for drinking water provision at the household level; (4) the role of the youth networks in implementing innovative water technologies; (5) technologies for providing drinking water services at the community level; (6) group work on the practical application of technologies, and (7) wrap-up of the conference recommendations, and final declaration.

The main recommendations include: (1) encourage local authorities to include the cost of monitoring and evaluation in municipal budgets; (2) strengthen the capacity of the municipal water and sanitation technical staff on monitoring and evaluation, infrastructure management and database use; (3) support the integration of household water treatments in the national drinking water policy; (4) advocate for the inclusion of subsidized low-cost technologies in government policies for the benefit of rural households; (5) strengthen commercial marketing; (6) develop public-private partnerships (PPP) to finance the low cost water infrastructure; (7) encourage the participation of youth networks in WASH sector conferences and fora in order to build their knowledge.

7.5.3.5. CLTS case study and advocacy workshop

USAID WA-WASH organized a study tour with 11 high-level decision-makers (8 men and 3 women) from the Burkina Faso government (journalists, sanitation agency, and advisors from the Ministry of Water) to USAID WA-WASH's sites in northern Ghana so that they can witness the success of unsubsidized CLTS applied in a similar socio-economic context as Burkina Faso. As a follow-up to the study tour, the Program organized a no-subsidy CLTS advocacy workshop on October 2, 2015 in Ouagadougou to advocate for the adoption in the national guidelines of no-subsidies for the construction of latrines. The workshop brought together 24 participants including 19 men and 6 women from the water and sanitation general directorate, the Ministry of Health, the Ministry of environment, technical and financial partners, international NGOs, journalist networks, and local NGOs.

8. GENDER MAINSTREAMING RELATED ACTIVITIES

The Program's achievements related to gender mainstreaming are summarized in Table 6.

Table 6: Gender mainstreaming related indicators status as of December 31, 2015

Indicator Number	Indicators	LoP target	Results as of December 31, 2015
IN.19	Percent of community level Water Users Associations (WUA) with at least 40% female membership	80%	91%
IN.39	Number of gender specific actions into WA-WASH plans developed and implemented	22	32
IN.40	Number of people trained in mainstreaming gender into WASH	319	7,198

The following activities were implemented in order to reach the targets stated above.

The USAID WA-WASH gender mainstreaming strategy focused on building the resources and capacity of the implementing partners to implement adaptive, gender sensitive programs in USAID WA-WASH target communities by integrating gender analysis and gender sensitive approaches and specific tools into their program cycles. The Program faced similar gender challenges within the three target countries. These challenges included the limited participation of women in WASH decision-making (latrine construction, water treatment, water payment, WASH governance, etc.) at household and community levels, the attitude of men towards the payment of water fees, the non-consideration of gender in the design of sanitation facilities, the heavy workload of women, the limited access of women to land for farming and gardening, etc.

In order to better understand the local contexts, the Program conducted a literature review of national and regional gender policies in water and sanitation sectors in Ghana, Burkina Faso and Niger. The findings of the literature review indicate that Burkina Faso, Ghana, and Niger have national gender policies in favor of women and girls rights. In terms of national gender laws, policies and strategies applied in the WASH sector, equal access and right of men and women to water and sanitation services is recognized as a human fundamental right in all three countries. However, national water policies in the USAID WA-WASH countries do not clearly address the issue of gender and do not give clear guidance on the role of women in the management of water resources.

As part of the gender mainstreaming activities, USAID WA-WASH conducted gender capacity building workshops for the Program implementing partners and stakeholders in Burkina Faso, Ghana, and Niger. Over 7,198 people from USAID WA-WASH partners, local NGOs, public and private stakeholders, and community members, were sensitized on women's empowerment. In support to this activity, a package of gender mainstreaming best practices with concrete illustrative examples for the USAID WA-WASH context was developed. This document is a set of simple tools that facilitates gender mainstreaming for more gender sensitive programming. Furthermore, the Program provided coaching and mentoring services on gender mainstreaming into WASH for USAID WA-WASH partners. In addition to assessing the strategies and activities conducted to support women's empowerment and marginalized people, this coaching and mentoring activity intended to measure the partners' understanding of key gender mainstreaming principles.

The Program also developed a gender resources list of WASH gender champions and resources in each country, including resources for training communities. This list is a database identifying local NGOs, community groups, women's groups and associations working in WASH sector as well as public and civil society institutions.

USAID WA-WASH undertook gender action research using empowerment approaches to enhance WASH sustainability and effectiveness in Burkina Faso and. The research served as a baseline to measure the levels of gender equity and women's empowerment, including control over water for productive purposes, WASH-related behavior change and existing functionality of water points. A total of 2,178 people (1,333 women and 845 men) were sensitized through this activity.

USAID WA-WASH also developed an advocacy strategy in order to promote policies and laws related to gender in the management and use of water, sanitation and hygiene in Burkina Faso and Niger. The strategy objective was to create a gender advocacy team who will take the lead on advocacy and continue to work for gender integration into WASH interventions. Accordingly, CARE organized a meeting with the permanent secretariat for the implementation of the integrated water resource management action plan in Burkina Faso (SP-PAGIRE in French) to engage them in the advocacy process. Involving SP-PAGIRE in gender and WASH advocacy ensures the sustainability of the integration of gender issues into national action plans beyond the life of the Program.

Furthermore, USAID WA-WASH organized a regional gender learning and sharing workshop for its implementing partners from February 9 to 10, 2015 in Ouagadougou. This end of Program activity was a framework for experience sharing on gender integration into WASH by the USAID WA-WASH partners, success stories from different intervention areas, identifying empowerment opportunities, discussing challenges encountered and leveraging the achievements made by partners in the field. The workshop brought together 56 participants (36 men and 20 women) from all USAID WA-WASH implementing partners, gender focal point from Nandom district of Ghana, Upper West Regional Gender Director, Burkina Faso Ministry for Women's Promotion and Gender, community members, and general secretaries from six municipalities in Burkina Faso.

At the country level, the Program developed a gender action plan of each target country. The main activities implemented in Burkina Faso included:

- Capacity building of staff and partners on gender mainstreaming into WASH
- Integration of 264 men in the awareness campaign of water treatment products
- Identification and training of 132 male gender champions
- Promotion of women participation in the executive board of water user associations
- Promotion of women access to land
- Capacity building of 13 VSLA groups
- Capacity of 86 women in leadership, public speaking, and water management
- Implementation of a gender action research within eight communities

In Ghana, the Program used a research-based approach, combining a participatory methodology with a strong engagement of all community actors to develop a gender integration model. The effort focused primarily on 10 communities, but the gender mainstreaming were conducted in all activities across Program intervention communities. The tools and approaches relied on gender analysis and research. USAID WA-WASH facilitated

the development of community-based gender action plans that involved traditional leaders, male gender champions, and gender officers from the district assembly. Furthermore, the Program established and supported VSLA groups to ensure the sustainability of gender awareness.

In Niger, USAID WA-WASH gender mainstreaming strategy focused on providing USAID WA-WASH local implementing partners with support as needed with their gender action plans and on gender assessment research in their local programming contexts. Accordingly, the Program conducted a study to assess the influence of gender on the functionality of water points and ultimately on WASH services. In addition, the community members were sensitized to facilitate women access to land, increase women participation in income generating activities, and increase women leadership over WASH services delivery. The Program established and trained MUS committees on support to this effort.

The program encountered two main challenges during the implementation of gender mainstreaming activities in Burkina Faso, Ghana, and Niger. The implementing partners took time to understand how to integrate a gender sensitive approach in the design of their activities. This challenge were overcome through coaching and mentoring sessions. The second challenge was related to the time necessary for behavior change to occur. Given that the results of gender mainstreaming activities are not obvious in the short term, some community members did not rapidly support the promoted approach and strategies. This situation changed

The primary expected outcome was that gender-sensitive interventions by USAID WA-

Success story: Breaking out of traditional gender roles

Realizing the importance of overcoming gender barriers to women's participation involves identifying and explicitly addressing restrictions faced by women. A study conducted by USAID WA-WASH through CARE in 10 of 22 project villages revealed a wide range of unmet gender needs. Women lacked access to potable water and they were harshly blamed when their family didn't have enough. They had no toilets. They were vulnerable to climate change (annual rains starting later and ending sooner) and suffered food shortages that made it difficult to cook for their families. They lacked access to land and water for gardening. They faced domestic violence when asking their husbands for money. They also lagged behind their male counterparts in social standing, respect, sense of dignity, and voice in community life. Brifo Maal, a village of 51 households, was ranked as the worst of the 10 studied at the onset of USAID WA-WASH, in terms of women feeling empowered. This situation changed since the Program intervention and community members are attesting these changes at different levels. Augustine Banyonu is a secondary school teacher and assemblyman for Brifo Maal, elected four years ago to serve as his community's voice in the District Assembly. Augustine argued that "today, we have united men and women and we created an environment where everyone can express themselves. Women no longer have a survivalist mentality for water and sanitation. We now have a borehole for water and we have built our own latrines. We now have a WatSan committee and VSLAs are mobilized".



Dooseuyir, a happy woman in her maize field

The Program's gender advocacy strategy also resulted in 430 women gaining access to plots for gardening in the Uper West region. Dooseuyir, now in her 50s, is the president of a 29-member women's VSLA called Nontaa Songtaa (see Photo 1). She also farms groundnuts, beans, tomatoes and millet, and is the proud owner of goats. When her husband died in 1989, his land was divided among her four sons. Two years ago, she finally got her own 1.5 acre parcel. She attested her happiness in the following words: "In the old days, women were not given any land to farm. That is just how it was. Now we work in the farms and grow healthy food for our families. Women here are happier. We go to our savings groups and buy shares. Water is nearer. We all have toilets, and open defecation is a thing of the past".

WASH partners would improve communities' gender awareness, produce empowered women and men, and support WASH sustainability. The Program conducted a final impact assessment of gender integration into partners' activities within the three countries. The study revealed an increased awareness of gender issues by USAID WA-WASH partners, supported by 24 gender specific actions implemented within the Program intervention areas in Burkina Faso and Ghana. As a result of gender related activities, 1,629 women received training on women empowerment and leadership. The Program identified and trained 176 male gender champions within Burkina Faso and Ghana, and 589 men have had their gender mainstreaming capacity strengthened to support the women empowerment in their communities. The Program introduced village savings and loan associations (VSLAs) in the three countries to increase the socio-economic power of community members in financing their WASH services and other livelihood activities. As a result, 147 VSLAs groups were established within 13 communities in Burkina Faso, 50 in Ghana, and 44 in Niger.

The gender mainstreaming approach enhanced women's participation in WASH and food security across the three countries. The engagement with the traditional authorities coupled with the work of the male gender champions enhanced women participation in WASH and food security across the target communities. As a result, 430 women gained access to farm land for market gardening in Ghana, 372 in Burkina Faso, and 126 in Niger. The Program also sensitized water management committees on the male/female ratio and the responsibilities of women in these committees, leading to most water management committees having more than 40% of members as women within the three countries. According to an end of project study conducted in Ghana, 95% of the respondents reported that the gender mainstreaming activities had contributed to increase access to land for women, 99% of respondents attributed this increase in land access to the fact that communities were sufficiently educated on women's empowerment issues, and educating men facilitate the process.

The awareness campaigns and the leadership capacity building coupled with the support of VSLA groups, produced positive results in terms of women's empowerment. Women began to hold leadership positions within their communities. The end of project survey showed a significant improvement in the decision-making capacity of women in their respective households as compared to control communities in which the Program did not intervene.

A gender outcome study conducted at the end of the Program revealed that community members admitted changes in attitudes (attending meetings regularly and punctually, women cooperating very well with men, both men and women routinely maintaining toilet and bath house, men and women coming together to solve family problems, etc.). The survey also found that women have stopped demanding material things from their husbands due to their involvement in VSLAs and that there is an increased sense of ownership of community projects.

In order to ensure the sustainability of gender mainstreaming activities, USAID WA-WASH established community-level structures such as VSLAs and male gender champions. The involvement of community leaders including community chiefs, queen mothers, and landlords, improved the gender equity and women's empowerment, also it gave a promising indication of community ownership of the whole process. Considering the significant results of this activity, there is a possibility to scale-up to more communities throughout the West Africa region.

9. GDA related activities

The Program's achievements related to GDA are summarized in Table 7.

Table 7: GDA related indicators status as of December 31, 2015

Indicator Number	Indicators	LoP target	Results as of December 31, 2015
IN.41	Number of institutional partnerships created as a result of USG assistance	5	5
IN.44	Number of successfully implemented action plans developed and revised by partnership practitioners	23	23

The following activities were implemented in order to reach the targets stated above.

In order to ensure the sustainability of the services provided by USAID WA-WASH and to expand the investment in the WASH sector, the Program developed partnerships to attract other public and private sector actors to invest in the Program. Accordingly, the USAID WA-WASH Program conducted a stakeholder and context analysis in each of the three intervention countries. The objective of the analysis was to identify and strengthen existing partnerships in the WASH sector between public, private and civil society organizations. According to the GDA assessment framework, the analysis evaluates four key areas namely (1) current context (2) current partnership practice; (3) potential for partnerships; and (4) stakeholder roles.

In July 2012, the Program through BPD undertook a comprehensive GDA analysis in Burkina Faso based on the GDA assessment framework. The Program held meetings with in Ouagadougou to explore potential partnerships with organizations such as the Burkina Faso Lottery (LONAB), IAMGOLD (mining company), Rotary Burkina Faso, and other partners. The Program assessed the ability and incentives to engage in GDA partnerships and scheduled priority actions to take with each potential partner. In Ghana, BPD undertook the initial GDA analysis in June 2012. This was based on a wide-ranging literature review and interviews with USAID WA-WASH partners and other key sector actors in Ghana. The BPD team interviewed over 20 in-country organizations. A local stakeholder feedback meeting was held June 26, 2012 in Accra with 20 participants, including USAID WA-WASH and USAID staff. The GDA analysis for Niger was conducted in November 2012. Initial contextual and stakeholder mapping identified several potential partners, including Orange Niger, Unilever, AREVA, beverage companies, Ministries of Water and Health, etc. A local stakeholder meeting was held to validate the findings of the GDA analysis in Niamey. A concept note was prepared to highlight the potential GDA activities that USAID WA-WASH could undertake with telecoms company Orange Niger.

The Program implemented the point of use water treatment activities through PROMACO. The activities were co-funded through the GDA partnership with LONAB. In addition, LONAB co-funded 72 scholarships in 2013 and 2014 for Master's programs in water and sanitation. LONAB also co-financed CLTS activities in 21 villages in Burkina Faso. The CLTS activities were implemented by WSA and FIU. Also, during the implementation period, the Program finalized the mechanism to accomplish the sanitation work funded by the Algerian Ambassador (African Diplomatic Corps) in Bazoule in Burkina Faso in 2014 through a local partner, SOS SAHEL. Through this partnership, 33 improved latrines were constructed.

USAID WA-WASH formalized five partnerships in Burkina Faso to promote water and sanitation. The partnerships were formalized with the European Union, LONAB, Rotary International, and African Diplomatic Corps and Peace Corps. In October 2014, the USAID WA-WASH formalized the partnership with the IRC/European Union that aimed to improve sanitation facilities in the Eastern region of Burkina Faso as a part of a program to build 15,000 latrines over a five-year period starting in 2015. The USAID WA-WASH contribution of \$339,033 leveraged \$1,035,255 in funding from the EU to install 3,400 household latrines and 250 showers across 20 communities, train 260 masons and 200 hygienists and certify 20 communities as ODF. The activities were implemented by IRC and the Swiss NGO Helvetas.

Furthermore, USAID WA-WASH signed a memorandum of understanding with Rotary International to jointly fund and implement MUS activities in seven villages in Burkina Faso. The Rotary International contribution of \$100,000 funded local NGO, Barka Foundation, to implement MUS and sanitation activities in the Eastern Region of Burkina Faso. The \$100,000 USAID WA-WASH matching grant funded technical assistance to Barka Foundation and an expansion of MUS activities in the existing USAID WA-WASH intervention areas, including grants to two local NGOs, OCADES Dedougou, and AMB. Training and technical assistance on the MUS approach began in 2013. The USAID WA-WASH matching grant aimed to reach 1,000 additional people gaining access to an improved drinking water source through 21 low-cost boreholes in six villages. In addition, through the matching grant 42 people were trained in WASH and 200 individuals were trained on best agricultural practices.

10. Conclusion

Since the inception of the Program in 2011, the USAID WA-WASH partners have designed and implemented field and capacity building activities with sustainability in mind. The approaches used by the the Program include: access to water and sanitation using low-cost technologies; capacity building across the WASH sector; community ownership of the interventions; involvement and promotion of the private sector; partnership with local NGOs; and buy-in from government. Notably, the Program has worked with more than 13 local NGOs since its inception, including PROMACO, ANIMAS-SUTURA, NODEF, APDO, DEMI-E, SOS Sahel, AMB Koudougou, OCADES Dedougou, Barka Foundation, Association des Volontaires pour le Développement au Sahel (VDS), PRUDA, Water and Sanitation for Africa (WSA), and ASUDEEC. Another sustainability strategy used by the Program consisted in is to leverage funds from non-US government donors. In total, USAID WA-WASH has received \$5,927,493 in matching or leveraged funds against a USG contribution of \$1,621,452 for a total USAID program investment of \$20,000,000.

Finally, many USAID WA-WASH activities were designed to be implemented in four phases over the life of the Program: pilot, adjust, scale up, and share lessons learned. This approach allowed the program to focus on achieving its objectives in early years and transition activities to local actors in later years. As the four-years of the program came to an end, we believe that the lessons learned from the implementation of the USAID WA-WASH Program can be beneficial to a number of WASH stakeholders and the scaling-up our field activities can be accomplished in a sustainable way given the conscious investment made to ensure the sustainability of all Program's activities. To ensure that the WASH sector as a whole addresses the need of the rural and urban population it is critical that the capacity of the major WASH regional institutions be addressed.



For more information on the USAID WA-WASH Program, please visit our website <http://wawash.fiu.edu>.

The Program continuously updated the different sections of its public website (news and events, publications, photo/video galleries, etc.) to inform visitors about USAID WA-WASH activities and share accomplishments and knowledge with WASH stakeholders.