



GRANT ACTIVITY COMPLETION REPORT

The Improving Family Planning and Increasing Access to Safe Water and Sanitation in Rural Communities Project, Madagascar

Water and Sanitation Module

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Annexes

Annex A – List and map of Voahary Salama WASH target zones

Annex B – Two *Photo and Caption* briefs submitted to USAID

List of Acronyms

CHW	Community Health Worker
EMMR	Environmental Monitoring and Mitigation Report
GFWSS	Gravity Flow Water Supply System
GSM	Grants Solicitation and Management
HIP	Hygiene Improvement Project
HPN	Health Population and Nutrition
HWS	Hand Washing with Soap
IEC	Information Education Communication
IEE	Initial Environmental Examination
IR	Intermediate Result
LOP	Life of Project
LQAS	Lot Quality Assurance Sampling
MOW	Ministry of Water
NGO	Non-Governmental Organization
PHAST	Participatory Hygiene and Sanitation Transformation
PMP	Performance Monitoring Plan
POU	Point of Use
PPP	Public Private Partnership
SNISE	Système National du Suivi/Evaluation
SO	Strategic Objective
SODIS	Solar Disinfection
USAID	United States Agency for International Development
USAID/M	United States Agency for International Development Mission in Madagascar
USG	United States Government
VS	Voahary Salama
WASH	Water, Sanitation and Hygiene

Executive Summary

This grant activity completion report presents the major achievements of the water, sanitation and hygiene (WASH) module of the *Improving Family Planning and Increasing Access to Safe Water and Sanitation in rural Madagascar* project; funded through the Grants Solicitation and Management agreement between the United States Agency for International Development (USAID) Bureau of Global Health and World Learning Inc. The Malagasy Non Governmental Organization (NGO) Voahary Salama (VS) implemented the 24-month project between October 2007 and September 2009.

The objective of the project's WASH module was to increase access to water and sanitation services through an integrated approach of strengthening management capacity of local water users associations, encouraging private sector involvement in the delivery of new technologies and services, and improving hygiene practices by scaling-up accepted hygiene and sanitation education methodologies at primary schools, health clinics, community and household levels. The project directly touched an estimated 126,112 persons, including providing sustainable access to an improved water supply for an estimated 15,732 people. Private sector operators and NGO implementing partners used manual well drilling techniques to construct 87 new boreholes fitted with locally produced hand pumps. 13 malfunctioning water points were repaired within the context of increasing capacity of local management committees. Two rainwater harvesting systems were installed at a school and health center. The project increased sanitation service delivery in rural areas by training 82 village-level masons to produce and market two-types of hygienic latrine slabs. 454 slabs were sold over the life of the project. The program used existing information, education and communication tools to promote behavior change vis-à-vis the 3 WASH messages: proper latrine use, hand washing with soap at critical moments, and safe water storage inside the home. Implementing partners trained over 260 community health volunteers in a variety of negotiation and communication techniques to promote the 3 WASH messages at different levels within their communities. The program targeted 146 elementary schools and 36 rural health clinics to transform these public places into "WASH friendly" facilities. NGO partners trained over 500 teachers and health workers in the WASH friendly approach. The project strengthened Voahary Salama member NGO's capacity to implement future projects in the water and sanitation sector through a series of trainings on key WASH related themes.

A coup d'état in March 2009 had a damaging effect on the project's outcomes. All activities directly supporting the local government, including working with schools and health centers, were suspended abruptly in March 2009. All remaining non-infrastructure related field activities were suspended in July 2009, followed by the termination of the entire project in September 2009, three months prior to the anticipated close out date of 31 December 2009.

This report begins with a summary of project management related themes: staffing, internal VS procedures, training, monitoring and evaluation, environmental compliance and targeting. The bulk of the report is dedicated to summarizing the project's outcomes per strategic objective, including a discussion of the project's accomplishments and shortcomings towards reaching the goals as defined in its Performance Monitoring Plan. Finally, a list of problems encountered and lessons learned are included to provide the reader with a set of concrete recommendations to guide future USAID investments in the Madagascar WASH sector.

I. Introduction

Water-born diseases cost the Malagasy economy an estimated \$40,000,000 annually in lost productivity, including 3.5 million lost school days and 5 million lost working days per year¹. Approximately 15 million people, over 80% of the Malagasy population, live in rural areas where access rates to improved water supplies and basic sanitation are 31% and 40% respectively.²

In October 2007, the *Improving Family Planning and Increasing Access to Safe Water and Sanitation in rural Madagascar* project (referred to henceforth as “the project”), was awarded to the Malagasy NGO Voahary Salama (VS) through the Grants Solicitation and Management agreement between the United States Agency for International Development (USAID) Bureau of Global Health and World Learning Inc. The Health, Population and Nutrition office of the USAID Mission in Madagascar (USAID/M) provided oversight and formative guidance during the project’s implementation.

The project’s WASH module addressed the main causes of diarrhea and water-born disease in rural Madagascar. The goal of the project was to increase access to water and sanitation services through an integrated approach of strengthening management capacity of local water users associations, encouraging private sector involvement in the delivery of new technologies and services, and improving hygiene practices by scaling-up accepted hygiene and sanitation education methodologies at primary schools, health clinics, community and household levels.

The project’s 5 Strategic Objectives (SO) and related Intermediate Results (IR) are:

SO 1: Increased access to sustainably managed improved water sources

IR 1.1: Broken water points rehabilitated and capacity of community water management committees strengthened;

IR 1.2: New water points constructed including training of water management committees;

IR 1.3: USAID approved POU household water treatment methods promoted

SO 2: Increased access and use of hygienic household sanitation facilities

IR 2.1: Hygienic latrine slabs produced and marketed in rural villages;

IR 2.2: Knowledge and practice of Hand Washing with Soap at critical moments by female caregivers increased

SO 3: WASH friendly primary schools and health clinics established

SO 4: Private sector operators providing products and services related to the water and sanitation sector supported

IR 4.1: Local entrepreneurs trained in manual well drilling and hand pump manufacture

IR 4.2: Private Public Partnership management contracts established

IR.4.3: Manual well drilling and pumping technologies promoted nationally

SO 5: VS members’ capacity to implement projects in the WASH sector increased.

¹ UNICEF (2002). *Assainissement le Defi*

² Ministry of Water power point presentation entitled: *Le WASH et le MAP*

II. Targeting

The project target area included 28 communes within 9 regions of Madagascar. According to results from the baseline survey in March 2009, the total population within the project communes was 249,576. The project did not aim to reach the entire populations in the target communes. Rather, certain villages (or *fokontany*) were selected in consultation with local government officials taking into consideration the results of the baseline survey, existence of complimentary ongoing development programs, and local priorities. The project worked directly in 84 *fokontany*, having a total population of 126, 112.

The USAID-funded Hygiene Improvement Project (HIP) also targeted seven communes within two regions. Project activities in these communes complemented HIP's presence by constructing water supply infrastructure at schools and health clinics, installing new public water supply systems, and increasing capacity of community groups to manage and maintain public water supply systems. Close collaboration was forged between VS and HIP to fuse the complementary programmatic themes in the shared intervention zones. The remaining 21 communes were chosen based on the results of a baseline survey carried out in traditional VS intervention communes. The communes surrounding the forest corridors in the ex-provinces of Tamatave, Fianarantsoa and Tuliara, where USAID had made long-term investments, continued to be priority for this project, as were communes that had participated in other USAID-funded projects in the past. Target communes were rural with few roads, limited transportation, and almost no public infrastructure. Annex A includes a list of target communes and a map showing the entire project zone.

III. Project Management

Voahary Salama, meaning "health with everything that is natural", is a platform of Malagasy Non-Governmental Organizations (NGO) that promotes an integrated vision of rural development combining activities aimed at simultaneously slowing population growth, improving public health, and improving natural resource management. Created in 2002, Voahary Salama has extensive experience managing projects covering a wide range of development objectives including: preventing HIV/AIDS, tuberculosis and malaria; increasing usage rates of modern family planning; improving mother and child health; and intensifying agriculture. Voahary Salama projects are implemented through its 12 member NGOs. This project was the first for Voahary Salama in the domain of water and sanitation.

An initial \$500,000 project award, earmarked as Development Assistance (DA) funds, covered the two-year period between October 01, 2007 and September 31, 2009. An additional award of \$250,000 Mother Child Health funding was added in January 2009, as was the approval of a no-cost 5-month project extension through February 2010. Unfortunately, USAID terminated the project prematurely in September 2009 after an unconstitutional change in the Malagasy government earlier in the year. Only 60% percent of the WASH program allocation was spent before the project suspension.

Voahary Salama member NGOs are well established within rural communities and work directly with decentralized government structures at the regional, district, and commune levels. Nine member NGO partners received sub-grants to implement a variety of field

activities consistent with the project’s Strategic Objectives. The amount of each sub-grant award was a function of the number of communes targeted by the NGO and the unique strategic technical approach taken by each organization. Table 1 shows the amounts of the sub awards for each NGO.

Typically, implementing partner field activities focused on the following:

- Lead communities through the Participatory Hygiene And Sanitation Transformation (PHAST) process resulting in community action plans for improving local water and sanitation conditions.
- Train, mentor, and monitor local health volunteers charged with creating demand for improved sanitation and increasing the incidence of hand washing with soap
- Establish or reinforce existing community management structures to maintain public water supply systems.
- Train and mentor local masons to produce and market hygienic latrine slabs.
- Lead elementary schools and health centers toward achieving the title of “WASH friendly” (e.g. train teachers and health workers, monitor action plans, etc.)

In addition to the community mobilization activities and training activities listed above, four NGOs (Ny Tanintsika, AINGA, Saf-FJKM Ambositra, ASOS Sud) constructed boreholes using the rota-sludge manual well drilling technique. As such, the sub grant awards to these NGO included additional funds related to borehole construction: salaries for well drilling teams, casing and pumping materials, materials for installing a sanitary apron, and associated transport costs.

Table 1: Shows the value of each Sub-grant

NGO Partner	Sub-grant amount (\$)
Association AINGA	49,309
Ny Tanintsika	68,597
MISINJO	14,248
PENSER	15,827
MATEZA	15,393
MICET	22,244
ASOS Sud	48,221
ASOS Est	18,839
SAGE	16,342
SAF-FJKM Moramanga	14,560
SAF-FJKM Ambositra	35,591

Field activities led by NGO implementing partners began in April 2008, or 7 months after the grant was awarded. Effectively, the NGOs had 17-months of active field presence from April 2008 – August 2009.

In addition to working through VS partner organizations, a close partnership was forged with the USAID-funded HIP to capitalize on their wealth of experience in promoting behavior change related to

the three WASH messages. VS also worked closely with the *Practica Foundation (Practica)* to train the four NGO members in manual well drilling, as well as four other local companies in manufacturing a new model of family rope pump. VS also engaged Practica to perform a mapping study with the goal of delineating the zones favorable for manual well drilling techniques in each of the project’s 9 target regions. VS also contracted the local social enterprise *BushProof* to install 46 boreholes and conduct water quality tests in 7 target communes.

a. Staffing, systems and procedures

Voahary Salama's central office is in Madagascar's capital, Antananarivo. The office is managed by a Director General and divided into various technical departments according to the nature of the projects being managed at any given time. One World Learning expatriate staff, acting as the WASH Programs Manager, provided technical and institutional support to VS and the partner NGOs over the life of the project. *NOTE: The project manager evacuated the country between March and May 2009 due to increasingly violent social unrest in the capital.* A Grants Manager billed full-time to the project directly supported him, as did a number of other support staff including the Monitoring and Evaluation Specialist and a team of Admin Officers who shared time with other projects. The VS home office staff coordinated all aspects of the WASH program module.

Each NGO had a Project Coordinator, Admin Assistant, Accountant, senior technical staff, and field staff. Typically all NGO office staff work on multiple projects at one time and only worked a percentage of their time on the WASH project module.

The project followed established VS administration policies and procedures during implementation. When necessary, the Grants Manager updated internal VS policies to assure compliance with USAID procedures. The Grants Manager also created a grants management manual specific for the World Learning project, which outlined the admin procedures and reporting system that the NGOs followed during the project.

b. Training

Trainings were an important facet of the project. VS member NGOs were trained in: PHAST, promoting small doable actions related to the three WASH messages, establishing community water management committees, hygienic latrine slab construction, and Solar disinfection (SODIS). In all cases, VS developed new or adapted existing training guides for the NGOs to use in the field. A team from the Ministry of Water (MOW) facilitated the trainings in collaboration with the WASH project manager.

NGOs were then responsible for training a cadre of community-based health volunteers in methods of negotiating small doable actions with mothers and demonstrating proper hand washing techniques, proper water storage and point of use water treatments. In addition, NGOs trained staff of rural health clinics and schools within the context of the "WASH friendly" facilities approach. Masons were trained to produce hygienic latrine slabs.

c. Supervision and monitoring

USAID approved the project's Performance Monitoring Plan (PMP) in October 2008. This document defined performance indicators for the outcomes and outputs of the project, outlined a plan to manage the data collection process from the VS NGOs that met the USAID/M reporting requirements, provided a framework for incorporating data collection requirements into activities implemented by VS and their implementing partners, and communicated expectations regarding reporting requirements to VS implementing partners. The PMP included relevant SNISE (*Système National du Suivi/Evaluation*) indicators used by

the Malagasy government to track national progress in the water and sanitation sector as well as relevant annual performance indicators required by USAID Washington.

The VS Monitoring and Evaluation Specialist established detailed monitoring and evaluation plans unique to each sub-grantee. NGOs submitted quarterly reports to VS that included updated indicator tracking tables reflecting progress from the previous quarter. Quarterly results from each NGO were compiled into a central database in Antananarivo. In addition, the VS Monitoring and Evaluation Specialist and the WASH programs coordinator conducted quarterly formative field trips throughout the project. Recommendations from field visits were shared with all of the NGOs to facilitate collective learning throughout the project.

The USAID/M water and sanitation projects manager and members of the VS technical staff performed an informal end-of-project field evaluation in October 2009. The evaluation team visited the work of six NGOs within seven communes in four target regions. A formal project evaluation by a third party agency was not completed because of the circumstances surrounding the sudden termination of the project.

In November 2009 two representatives from USAID/M performed a spot check on the VS data management system to assess quality in the projects' management of field data. Performance indicator reference sheets were completed for the two OP indicators critical to the program. The USAID/M team found the VS data to be of high quality, verifiably accurate, and consistent with data reported in quarterly reports from the NGOs.

d. Environmental compliance

USAID/M approved the project's Initial Environmental Examination (IEE) in January 2009. This document, in accordance with 22CFR216, provided the first review of the reasonably foreseeable effects on the environment, as well as recommended threshold decisions for each project activity. The IEE provided a list of monitoring and mitigation measures required for the activities related to infrastructure construction categorized under negative determination with conditions. Mitigation measures included: use of an environmental screening form for all drilling sites, keeping borehole logs, and performing water quality testing for arsenic and fecal coliforms at each water point installed during the project. Surprisingly, 3 boreholes in the commune of Beproasy tested positive for elevated levels of arsenic on two occasions. Further follow up tests, however, were negative and the pumps were not removed from the boreholes. All other boreholes tested negative for arsenic. On a few occasions, boreholes drilled using the rota-sludge technique tested positive for low levels of fecal contamination. In these cases, boreholes were re-chlorinated and tested after one month at which time no traces of contamination were detected. Voahary Salama submitted a follow-up Environmental Monitoring and Mitigation Report (EMMR) to USAID in September 2009, summarizing the projects' exhaustive efforts taken to follow the mitigation measures outlined in the IEE.

IV. Program Accomplishments by Strategic Objective

This section summarizes the major outcomes and outputs of the project. Results are presented in tabular format to comparatively show the baseline value, target number cited in

the PMP, Life of Project (LOP) result, and the % of target achieved by the end of the project.

a. SO 1: Access to sustainably managed improved water sources increased

Result	Indicator	Baseline value	Target	LOP Result	% of target reached
Strategic Objective 1: Access to sustainably managed improved water sources increased	People in target areas with access to improved drinking water supply as a result of USG assistance (OP)	0	27,700	15,732	56.8%
	Liters of drinking water disinfected with USG-supported point-of-use treatment products (OP)	0	ND	365,125	ND
Output 1.1: Existing improved water points rehabilitated /retrofitted and capacity of community water management committees strengthened	# of existing improved water points rehabilitated/ retrofitted and community water management structures strengthened (SNISE)	0	36	14	40%
Output 1.2: New improved water points constructed including training water management committees.	# of new improved water points constructed with functioning community management structures (SNISE)	0	150	87	58%
Output 1.3: USAID approved POU household water treatment methods promoted	# of bottles of Sur Eau sold by the ASBC during the project.	0	2,300	1,342	58%
	% of households having knowledge of the SODIS (Solar Disinfection) water treatment system	0	30%	26.6%	89%
	% of households using the SODIS water treatment system	0	10%	3.2%	32%

Discussion

The project provided 15,734 persons with access to an improved water source. This number represents only 56% of the project’s target for this outcome. *NOTE:* the 15,732 persons receiving access to improved water supply does not include persons using water points constructed at 3 health clinics and one school because of the lack of an established method for making an accurate estimation of the number of daily users at each site.

Reasons for the project falling well short of its target in terms of numbers of persons with access to an improved water source include: USG sanctions prohibited the project from installing water points at schools and health centers beginning in April 2009; a Public Private Partnership to rehabilitate and manage the water supply system in a large district center of over 4,000 persons being abandoned in April 2009; and two communes being deemed unfeasible for manual well drilling after a preliminary feasibility study completed in December 2008. In addition, one of the NGO trained in the rota-sludge technique seriously underperformed during the project, constructing only one productive borehole in 9 months.

In respect to Point of Use (POU) water treatment, the project did not attempt to quantify the numbers of liters of water treated by boiling because of the difficulty inherent in accurately measuring the correct application of the technique. As for the other two methods, VS estimates that 365,125 liters of drinking water were treated using Sur Eau and SODIS as a result of the project.

Output 1.1 Existing improved water points rehabilitated /retrofitted and capacity of community water management committees strengthened.

The project successfully rehabilitated 14 of the 36 abandoned water points identified at the start of the project. Rehabilitated infrastructure included one Gravity Flow Water Supply System (GFWSS) with 7 public standpipes, and 7 boreholes fitted with *vernet* model hand pumps. Rehabilitation was done within the framework of community action plans established by the community during the PHAST process. Communities contributed raw materials (i.e. gravel and sand), and unskilled labor to these projects. Trainings to reinvigorate existing community management structures were an important component of the rehabilitation process, as was training a group of local technicians charged with long-term maintenance of the infrastructure.

Output 1.2: New improved water points constructed including training water management committees

A combination of private sector and NGO well drilling teams installed a total of 87 new water points during the project. These teams used a variety of manual well drilling techniques – EMS drilling, rota-sludge, and jetting – depending on the soil conditions at the drilling sites. The locally manufactured and government approved *canzee* pump was fitted on most boreholes. A small number of boreholes were fitted with a family rope pump model designed for use by less than 100 persons daily. The average number of daily users for the 87 water points was 167 persons. This figure is considerably lower than the Malagasy government assumption of 250 users per water point when calculating the national access rate to an improved water source. In addition, two rainwater harvesting systems were installed at a elementary school and health center. All new water points were branded with a donor plaque containing the logos of USAID, VS, the local NGO, and the Ministry of Water.

The project used The Participatory Hygiene And Sanitation Transformation (PHAST) process to prepare communities for the infrastructure construction. PHAST is a seven-step process that uses methods and materials that stimulate the participation of women, men and children in the development process. It relies on the use of graphic materials that reflect the actual characteristics of communities in a particular area. NGOs lead communities through a series of participatory exercises meant to: identify community problems; understand the links between dirty water, un-hygienic sanitation and hygiene practices, and common health problems in the community; identify and understand possible solutions; and plan communal actions to improve health. The sudden termination of the project meant that no NGO reached the 7th step in the process; a community celebration after achieving goals outlined in the community action plans.



Teams from the local enterprise *BushProof* installing a borehole using the EMS manual drilling technique

In 5 communes, the project collaborated with the social enterprise *BushProof* to pilot novel strategy aimed at assuring the longterm maintenance and sustainability of water points constructed in remote rural areas. In this scheme, VS negotiated multi-year annual maintenance contracts between BP and the mayors of the communes, who are lawfully responsible for assuring the maintenance of all infrastructures in their jurisdiction, to guarantee maintenance of each of the boreholes installed during the project. The communes agreed to pay \$60 per year per each water point and sign a minimum of a two-year contract after installation. In return, *BushProof* agreed to make quarterly visits to each borehole months for routine maintenance. A technician is also available on an on-call basis in the event of an emergency. BP was maintaining a total of 45 water points in this way at the end of the project. For the remaining boreholes not maintained by *BushProof*, the project trained two local technicians at each water point in how to maintain the hand pumps as well as established a local supply chain of spare parts for the canzee model hand pump installed at each borehole.

Output 1.3: Point of Use (POU) household water treatment methods promoted

The project worked through a network of 260 Community Health Workers (CHW) to disseminate messages about household water treatment and storage. CHW promoted three USAID approved POU treatment methods: the chlorine solution *Sur Eau*, Solar Disinfection (SODIS), and boiling. Messages were transmitted via household visits, casual conversation, informal group discussions, and public skits and marionette shows. The CHW transmitted messages related to POU water treatment and storage to an estimated 80,000 persons over the life of the project.

Work to establish a Memorandum of Understanding between VS and PSI to sell *Sur Eau* in all project communes was abandoned in March 2009. As a result, *Sur Eau* was sold in only 6

of the 27 target communes. A total of 1,342 bottles of Sur Eau were sold during the project. Discouraging, a dependable supply chain to continue supplying Sur Eau was not established before the end of the project.



A household in the Commune of Tranomaro, Region Anosy, practicing SODIS

The project promoted SODIS in five communes in two arid southern regions of the country. Before this project there had been little experience promoting SODIS in Madagascar though conditions in the southern and western parts of the island are ideal for its application. The project manager gave a special training on SODIS to field staff from three NGOs, and action plans were developed to aggressively promote SODIS in five communes. One NGO, ASOS Sud, received a donation of over 1,000 used PET bottles, the type that is required for SODIS, from a mining company. These

were distributed to vulnerable households in their 3 target communes.

Results from the final LQAS survey related to SODIS were encouraging, with over 26 percent of female head-of household in the five target communes reporting having knowledge of the technique at the end of the project. Adoption rates were much lower at only 3%, but this is to be expected given the typical time it takes to introduce a new innovation, compared to the short period and limited resources field partners had to promote the technology.

b. SO 2: Access to hygienic sanitation facilities increased

Result	Indicator	Baseline value	Target	LOP Result	% of target reached
Outcome 2: Access to hygienic sanitation facilities increased	Number of people in target areas with access to improved sanitation facilities as a result of USG assistance (OP)	0	15,600	5,448	35.0%
	% of households having traditional latrines	32.79	37.79% (Baseline plus 5%)	49.9	152% (target +12% points)
	% of households having hygienic latrines (SNISE)	17.89	22.98 (Baseline plus 5%)	7.5%	minus 10% points
Output 2.1 Hygienic latrine slabs produced	# of hygienic latrine slabs sold by local masons	0	1,300	454	35%

Result	Indicator	Baseline value	Target	LOP Result	% of target reached
and marketed in rural villages.					
Output 2.2: knowledge and practice of Hand Washing with Soap at critical moments by female caregivers increased	% in female caregivers who score above a “6/9” on the LQAS survey regarding hand washing	43.85	53.85 (Baseline plus 10%)	51.00	94%
	% of latrines with the necessary materials needed for HWS in their vicinity.	8.2	18.3 (Baseline plus 10%)	4.3	Minus 4% pints

Discussion

No program aimed at reducing water-borne disease is effective without improving sanitation and promoting hand washing. Nevertheless, sanitation is often a much lower priority for rural communities than is an improved water supply. The project adhered to USAID Madagascar’s policy of subsidy free toilet promotion. The project’s multi-faceted sanitation promotion strategy used schools, health centers, community health workers, and local masons to disseminate messages about the proper use and maintenance of simple, locally affordable toilets models. The NGO encouraged households to take steps up the “sanitation ladder”, meaning that those having latrines were encouraged to improve their structure and upgrade to a pit with a washable platform, while households practicing open defecation were encouraged to build simple structures using locally available resources.

At first glance, the outcome of only 5,448 out of a target of 15,600 persons receiving improved sanitation is disappointing. However, results of the project’s efforts promoting improved sanitation are deceptive. USAID and the government of Madagascar consider only latrines that have washable platforms to be improved. The PMP indicator for the project was to sell a minimum of 50 latrine slabs in each of the 28 target communes. This target was likely too ambitious for such a novel approach given the short project duration and the remote, impoverished target communes. Nevertheless, the project sold 454 washable latrine slabs. This figure assumes that 12 people share a latrine. It also should be noted that hygienic latrine platforms were marketed in only 26 of the 28 target communes. The other two communes were excluded from this activity because of environmental concerns about contaminating the shallow groundwater supply with simple, unlined pit latrines. NGOs reported that the subsidy free nature of the approach was a barrier to convincing households to invest in an "expensive" \$7 latrine slab.

This figure also does not capture the number of students using toilets and urinals built at schools during the project. As a result of the suspension, NGOs were unable to continue supporting school action plans aimed at achieving the status of "wash friendly". In the absence of project support, many toilets remained only partially finished. In cases where latrines were finished before the project suspension, there numbers are not included here because they were not considered when setting the target cited in the PMP.



Example of a locally produced sanplat model purchased by a rural household, Commune of Ambodimangavalo

Considering only latrines with washable platforms as improved does not capture the efforts made by many households to take a step up the sanitation ladder by constructing a simple, un-hygienic with their personal resources. These considerable gains were captured in the statistically significant increase in households with non-hygienic sanitation facilities from 32.5 % at baseline to 49.9% at the end of the project. It is unfortunate that these gains are not reported annually to USAID Washington, as they represent a first step towards the long-term goal of reaching the ideal situation of 100% improved sanitation coverage.

discovered that some NGO had mistakenly counted non-hygienic latrines as hygienic. However, these errors were not adjusted for when defining the project’s PMP baseline indicators because it was impossible identify with certainty where and how frequently the errors occurred. It is not surprising, therefore that the end-of-project survey results yielded this result.

The numbers of persons in the target zones using improved latrines reduced significantly at the end of the project compared to the baseline. The likely cause to this anomaly was improved precision in the final survey compared to the baseline in terms of properly identifying improved latrines as only those having a washable slab. While processing the baseline results, VS

Output 2.1 Hygienic latrine slabs produced and marketed in rural villages

To facilitate the availability of hygienic latrine slabs in the projects’ 26 target communes, NGOs trained and equipped more than 80 local masons to produce and market two types of sanitation platforms or “sanplat”. Sanplat is a proven intermediate technology that fits the World Health Organization definition of a hygienic latrine slab and can be installed in both new or existing latrines. Each mason was given a “starter kit” (moulds, 100 kg of cement, reinforcing steel) that allowed them to begin producing sanplats. Sanplants were sold at a price that was affordable yet profitable to the mason.



Local workshop producing SanPlat latrines in the Commune of Andasibe

In some cases, parents’ groups ordered sanplats to install in school latrines. Social marketing techniques varied by commune, with some masons agreeing to share a percentage of profits with a CHW who convinced a household to invest in the product. In a handful of communes, masons set-up high profile workshops close to public gathering places from which to produce and market their products.

Output 2.2: knowledge and practice of hand washing with soap at critical moments by female caregivers increased

Hand washing with soap (HWS) or an appropriate alternative at critical moments is proven to prevent 35% of diarrheal disease. To increase awareness of the critical moments for HWS and the proper steps for effective hand washing among mothers with young children; the project trained local CHW to promote HWS using IEC tools and negotiation techniques developed by the HIP project. Simple water dispensers made of locally available materials or “Tippy taps” were promoted as an appropriate technology to facilitate hand washing at households, schools, and rural health centers. Project records estimate that approximately 40,000 persons were exposed to messages promoting HWS over the life of the project. This resulted in a statistically significant increase in female caregivers who score above a “6/9” (correctly citing 6 of a possible 9 correct answers relating to the critical moments and proper steps related to hand washing) on the final LQAS survey compared to baseline.

c. SO 3: WASH friendly primary schools and health clinics established

Schools and health clinics are natural gateways into rural communities. The national WASH platform developed the “WASH friendly” schools and health centers approaches in 2007. These approaches, essentially identical in terms of activities, each have guides published by the Ministry of Health and the Ministry of Education that outline a stepwise process for achieving WASH friendly status. The project anticipated certifying 146 elementary schools and 36 health centers as WASH friendly by the end of the project.

Result	Indicator	Baseline value	Target	LOP Result	% of target reached
Outcome 3: WASH friendly primary schools and health clinics established.	# of WASH friendly primary schools established according to national norms. (SNISE)	0	146	0	0%
	# of WASH friendly health centers established according to national norms including having proper systems of disposal of hazardous medical waste. (SNISE)	0	36	0	0%

Discussion

From June 2008 until March 2009, NGOs worked with health clinics and elementary schools to achieve the title of a WASH friendly, including training over 400 teachers and health clinic staff in promoting the three WASH messages. The project promoted friendly competition between neighboring schools to maximize performance and encourage innovation. Each facility received a set of posters and IEC materials related to each of the three WASH



Example school latrine with separate cabins for boys and girls built with local funding from a parents association in the commune of Beforana

messages. A kit of jerry cans with plastic taps and two buckets were distributed to most clinics. At schools, parents' associations purchased soap used in daily hand washing demonstrations. The project anticipated organizing festivals at the end of the project to award the title of WASH friendly to each establishment.

Discouragingly, all progress towards certifying schools and health centers as WASH friendly was suspended in March 2009. As a result, no schools or health centers completed the certification process. School action plans were at different stages of completion at the time of the

suspension. In terms of infrastructure, some schools completed building latrines with separate boys and girl's cabins using money collected by local parents associations. In other cases, infrastructure construction was abandoned when the NGO support ended.

d. SO 4: Private sector operators providing products and services related to the water and sanitation sector supported

Result	Indicator	Baseline value	Target	LOP Result	% of target reached
Outcome 4: Private sector operators providing products and services related to the water and sanitation sector supported	# of boreholes drilled using manual well drilling technologies and fitted with low cost hand pumps installed by national private sector operators	0	70	40	57%
	# of boreholes drilled using rota-sludge technology and fitted with low cost hand pumps by NGO drilling teams	0	80	47	58%
Output 4.1: Local entrepreneurs trained in manual well drilling and hand pump manufacture	# of well drilling teams trained in rota-sludge technologies	0	4	4	100%
	# of local workshops trained in manufacturing the family rope pump (SNISE)	0	4	4	100%
Output 4. 2: PPP management contracts established	# of PPP management agreements for large gravity flow water systems established during the project (SNISE)	0	1	0	0%

Result	Indicator	Baseline value	Target	LOP Result	% of target reached
Output 4. 3: Manual well drilling and pumping technologies promoted at regional and national levels.	# of technical studies published and regional/national workshops organized promoting manual well drilling and pumping technologies. (SNISE)	0	2	1	50%

Discussion

Combining manual well drilling technologies with inexpensive, robust, locally produced hand pumps has the potential to revolutionize water service delivery in rural Madagascar. To this end, engaging the private sector to supply products and services related to the WASH sector in underserved communities was a core concept within the water component of the project. The project anticipated the involvement of the private sector to take on two forms: (1) Establishing a PPP to rehabilitate and manage one large gravity flow water supply system and (2) Training NGOs and local entrepreneurs in the manual well drilling technique rota-sludge and the production of a low-cost model hand pump.

Output 4.1: Local entrepreneurs trained in manual well drilling and hand pump manufacture



Training 4 NGO in the Rota-sludge manual well drilling technique

The project engaged the *Practica* to train four NGO-sponsored drilling teams, in the rota-sludge manual drilling technique. Participating NGOs were selected based on prior experience in the water and sanitation sector, and their likelihood to continue offering drilling services to the public at the end of the project. Using rota-sludge, a five-man crew can drill a 4.5-inch (100mm) borehole to a depth of 95 ft. (30 meters) in less than 15 days. Each team was given two complete “kits” of rota-sludge tools, manufactured locally in Antananarivo out of commonly available materials.

Over an 8-month period, three drilling teams installed 12, 15, and 17 boreholes respectively. This success demonstrates that rota-sludge is a robust technology appropriate for many parts of Madagascar. Of particular interest was the adaptability of rota-sludge to the high plateau regions traditionally serviced exclusively by expensive GFWSS. Combining this technology with the *canzee* hand pump, also manufactured in Madagascar, resulted in an average cost per beneficiary of less than \$10 for two of the four drilling teams; making this the most cost-effective approach available to increasing access to an improved water supply in rural areas.

Rota-sludge drilling was generally successful, but not entirely without complications. One NGO lost an entire drill rig when an 18m deep hole collapsed encasing the materials in 10 meters of thick mud. A combination of unfavorable geology and human error resulted in one rota-sludge team based in the south installing only one productive borehole over an 8-month period.

In addition to rota-sludge, The *Practica* also trained four local entrepreneurs to produce the family rope pump, a technology new to Madagascar at the time. This two-week training was cost shared by the Dutch NGO Water for All. Each entrepreneur is now selling family rope pumps in their four respective regions throughout the county. One particularly motivated entrepreneur in Fianarantsoa sold and installed six rope pumps before the project ended. He anticipates continuing to market the product via word-of-mouth advertising and participating in demonstrations periodically organized by the local WASH committee.

Output 4. 2: Private Public Partnership (PPP) management contracts established

The project laid a solid groundwork towards establishing one PPP to rehabilitate and manage a GFWSS in a large district center with a population of approximately 4,500 persons. VS organized a series of meetings with local authorities and a group of interested investors beginning in May 2008. The competitive bidding process was scheduled to begin in late January with construction scheduled for March 2009. Sadly, one manifestation of the social strife that gripped the country in the early months of 2009 was a wave of ethnically motivated crimes towards merchants from the high plateau region working in coastal regions. Each of the four potential investors expressing interest in the project fitted this profile, and in February 2009 they requested that the activity be postponed until the political situation had stabilized. Unfortunately, this activity was canceled entirely when USAID suspended all project activities targeting public facilities, many of which would have benefited from the project.

Output 4. 3: Manual well drilling and pumping technologies promoted at regional and national levels

The intent of this output was to advocate for the expanded use of low-cost, appropriate technologies for increasing access to an improved water supply in rural areas of Madagascar. The project anticipated organizing one national workshop to share experiences among the many projects working in the domain of manual well drilling. In addition, three regional workshops with local government officials were planned for March 2009. Each of these activities was canceled as a result of the crisis.

One successful activity within this output was hiring *Practica* to perform a hydrogeologic mapping study to delineate areas suitable for a variety of manual drilling technologies within the 9 target regions. Results from the study concluded that over 40% of the population in the project's target regions could be served using manual well drilling. The study projected that using manual well drilling technologies to supply water to these populations would cost 50% less than conventional technologies. Capitalizing on manual well drilling technologies is thus a cost-effective use of limited government resources and a viable strategy for reducing the funding gap needed to reach the country's development goals for rural water supply.

e. **SO 4: Capacity for Voahary Salama partners to implement future projects in the water and sanitation sector increased.**

Result	Indicator	Baseline value	Target	LOP Result	% of target reached
Outcome 5: Voahary Salama members' capacity to implement projects in the WASH sector increased.	# of technical trainings and capacity building workshops attended by the VS implementing partners	0	6	6	100%

Discussion

One of the objectives within the GSM grants mechanism is increasing the technical and institutional capacity of recipient organizations. Prior to this grant, few VS NGOs had implemented projects in the water and sanitation sector. Trainings events to build capacity were organized on the following topics: PHAST, small doable actions related to the three WASH messages, community management of community rural water supply, latrine building. In addition, Voahary Salama continued to be an active member of the National Diorano-WASH steering committee, and grant recipients participated actively in WASH activities organized in each of the project regions.

V. Problems Encountered and Lessons Learned

The following is a list of problems encountered and lessons learned during the project's implementation. These are meant to assist in the design and of future USAID investments in the Madagascar water and sanitation sector.

a. Problems Encountered

- The 2009 political crisis:** As referenced multiple times in this report, the national political crisis that began in January 2009, culminating in a coup d'état in March and the project's premature termination in September prevented the project from achieving many of its ambitious objectives. Voahary Salama estimates that at a minimum, an additional 40 boreholes and 2 gravity flow water supply systems, providing access to an additional 8,680 persons, would have been installed had the project continued until December 2009. The premature suspension of non-infrastructure related activities in July 2009 prohibited the NGOs from implementing a sustainability plan in each target commune.
- Contracting VS NGOs to perform the baseline survey:** Voahary Salama contracted NGO partners to perform the baseline survey in their anticipated intervention zones. Results from the baseline survey were poor. Many survey forms were completed incorrectly, yielding results that were sometimes inconsistent with known local conditions. For example, one remote commune along the east coast was reported to

have 98% latrine coverage, with all latrines there reported to be hygienic. Nowhere is this a reality in Madagascar. As a result, accurately determining the baseline values for some indicators, specifically those for sanitation coverage, was difficult. The project, however, had little choice but to use these results when setting the project targets reported in the PMP.

3. **Difficulty drilling in the south:** Rota-sludge drilling in the south was slowed by the existence of semi-impermeable layer of consolidated limestone 6m below the surface. The NGO using the Rota-sludge technique to drill in the south completed only one positive borehole in 8 months. This issue could have been avoided by an accurate scoping study before deciding to drill in these communes.
4. **Producing dome sanplats:** Local masons produced and marketed two types of *sanplat*, a dome and square model, during the project. Of the 467 *sanplants* sold, less than 2% were dome models. The principal reason for this was the inability of the local masons to master the technique of properly fabricating the dome model. Monitoring visits revealed that dome models were often either too thin or did not respect the correct slope of the dome shape. Fearing the possibility of poor local craftsmanship leading to an unsafe product susceptible to collapse, the project decided to abandon dome model *sanplat* in February 2009.

b. Lessons Learned

1. **Number of beneficiaries per water point:** The average number of persons using boreholes constructed during the project is 167. This number is significantly less than the figure of 250 that the ministry of water uses arbitrarily to calculate access rates for rural water supply in Madagascar. This number reflects the dispersed living patterns typical of rural areas, and is consistent with the number of users that one *canzee* pump can suitably support. As such, future USAID programs should consider aiming for higher coverage rates than typically achieved in rural areas.
2. **Training masons in local areas:** The project's strategy of promoting hygienic latrine slabs through groups of local masons was a mixed success. However, in four communes, including two that were two days walk from a navigable road, local masons sold over 50 latrine slabs in less than 8 months. This result not only achieved the intended project objective, but also proved to be a significant source of additional income for the masons. It is unlikely that providing a service such as this will ever be profitable enough to be a full-time job; however, the activity has proven to provide a significant source of disposable income for vulnerable households.
3. **SODIS in the south:** The project's positive results promoting SODIS in the arid south are encouraging in a region where a fresh water source is often more than 10 km away. Future investment should be directed to disseminating SODIS in areas where it is climatologically favorable for its application and developing new IEC messages and communication tools that reflect local dialect of the region.

4. **Mobilizing local resources for achieving WASH friendly schools:** Multiple NGOs reported success in mobilizing community funding for toilet construction within the WASH friendly approach. Every public elementary school in Madagascar receives an annual allocation of money from the federal government for unrestricted activities related to the school. Parents' associations allocate this funding depending on local needs and priorities. If effectively coordinated, mobilizing this source of funding represents a significant opportunity for donors to stimulate local investment towards community WASH activities.
5. **Cost effectiveness of rota-sludge:** The cost per beneficiary of boreholes installed by two of the VS NGOs was less than \$10. This cost, including drillers' salaries, construction materials, and monitoring and evaluation, is the most affordable option for infrastructure construction available in Madagascar (or anywhere else in the world). As such, Rota-sludge should be promoted in zones where conditions are favorable. Eventually, NGO drilling teams should be transformed into small-scale enterprises that offer their services to local populations without donor support.
6. **Exploring new approaches for maintaining water points:** The enthusiasm of local authorities to engage in the partnership with BushProof to maintain water points in their domain is an encouraging step forward to a more sustainable model for assuring regular service delivery in the rural water sector. The long-term effectiveness of this model should be monitored and documented by USAID/M.

VI. Documentation of Shared Learning

Voahary Salama published two *Photo and Caption* briefs during the project (See *annex B*). In addition, the VS approach to latrine promotion was featured as a best practice in a national report commissioned by UNICEF Madagascar. The mapping project done by Practica is available on the USAID development clearinghouse website, as will be the final version of this report.

VII. Follow-up and Sustainability

Given the suddenness of the project suspension, there was little opportunity to implement a formal project exit strategy and sustainability plan. As a result, some of the project's achievements, specifically those related to schools and health centers risk being lost. Similarly, it is probable that local masons who underperformed during the project will discontinue offering their services after the project is finished. In the other communes, however, where significant demand for improved sanitation was stimulated, masons are likely to continue producing *samplats* in the future.

Voahary Salama believes strongly, however, that the new water points installed by both the NGO and BushProof are likely to be properly maintained for years to come. In the case of water points installed by NGOs, there exist at each borehole a robust community management structure with access to a readily available supply of spare parts. As detailed

previously, each borehole installed by BushProof will be maintained through a multi-year management contract between BushProof and the commune in which a BushProof technician will visit the boreholes every three months to perform preventative maintenance and repair. Assuming that the communes are satisfied with this service and renew their contracts as anticipated, this is a sustainable system that could lead to a revolution in water service delivery in Madagascar.

Regardless of the efforts made during the project to achieve sustainability in terms of water supply, Voahary Salama recommends that USAID continue to support the management and maintenance of the water supply infrastructure in the project's target communes as part of future WASH investments. It is important that some level of support be maintained given the extraordinary conditions of the project's sudden termination.

VIII. Conclusion

The final outcomes of the WASH project module were a mixed success. The project achieved only 50% of its goals in terms of increasing access to improved water sources and hygienic sanitation facilities. Nearly half of the project implementation period was mired by a national political crisis that paralyzed national, regional, and local government structures. Many of the project's activities were suspended in March 2009, and the project was terminated in September 2009, three months before its anticipated end date. In spite of this, VS through its member NGOs showed great courage and perseverance working in such difficult circumstances and tangible, significant results were achieved. The project successfully demonstrated that manual well drilling has great potential in much of Madagascar, and is an affordable alternative to other traditional piped water supply. Promoting sanitation through local masons proved, in some cases, to be an effective strategy of increasing access to services in remote areas. Also, the project piloted a new strategy to assure the long-term maintenance of water points through annual maintenance contracts with a private sector service provider, and robust hand pumps models not previously available in Madagascar are now being marketed to the public. As such, despite the setbacks, the project was successful in paving the way for future USAID investments in the Madagascar WASH sector.

Annex A – List and map of Voahary Salama WASH target zones

Region	NGO	District	Communes
Amaron'i Mania	SAF FJKM	Fandriana	Imito
		Manandrina	Anjoman'Ankona
Haute Matsiatra	NT	Ambalavao	Ambohimahasina
			Sendrisoa
			Miarinarivo
	AINGA	Ambohimahasoa	Vohitsaoka
			Ambalakindresy
			Morafeno
Antsinanana	ASOS Est	Brickaville	Manandroy
			Vohitrانivona
Analanjorofo	MATEZA	Vatomandry	Anivorano Est
		Vavatenina	Ilaka Est
Alaotramangoro	MITSINJO	Moramanga	Ambodimangavalo
			Tamatve II
	SAF FJKM		Andasibe
			Amboasary
Vatovavy Fitovinany	MICET	Ikongo	Mangarivotra
			Beforana
			Tolongoina
Anosy	ASOS Sud	Amboasary	Maromiandra
			Ikongo
			Behara
Atsimo Andrefana	SAGE	Tuliara II	Tranomaro
			Ifotoka
Itasy	PENSER	Miarinarivo	Anakao
			St Augustin
			Soamahamainia
			Antoby Est
9 Regions	11 Partner NGOs	13 Districts	28 Communes

ZONES D'INTERVENTION DE
VOAHARY SALAMA
Eau hygiène Assainissement



LEGENDE

- Communes d'intervention
- Limites des régions
- Districts d'intervention

100 0 100 200 Kilometers



Annex B – Two *Photo and Caption* briefs submitted to USAID during the project



USAID | MADAGASCAR
FROM THE AMERICAN PEOPLE

PHOTO & CAPTION

Manual Well Drilling: A viable approach for reaching the MDG for rural water supply



Photo: Jonathan E. Amis

The project trained four teams in the *Rota Sludge* manual drilling technique in which a five-man crew can drill a 4.5-inch (100mm) borehole to a depth of 95 ft. (30 meters) in less than 15 days. *Rota Sludge* drilling tools are produced locally out of commonly available materials. Combining this technology with government approved, low-cost hand pumps, results is the construction of water points at a cost per beneficiary of less than 10 USD; the most cost-effective approach to increasing potable water supply in rural areas.

U.S. Agency for International Development
www.usaid.gov

In Madagascar, some 60% of the total population, including over 70% in rural areas, lack access to an improved water source. The deadly combination of inadequate clean water supplies, widespread open defecation practices, and poor hygiene behaviors result in diarrheal disease being the second leading cause of mortality among children under the age of five. Madagascar is not on track to reach the Millennium Development Goal (MDG) for improved water supply coverage in rural areas. The government reports an annual funding gap of over 60 million USD needed to construct the water supply infrastructure necessary to reach this objective.

Increasing sustainable access to improved water supply is one of the goals within the water and sanitation component of USAID's integrated *Improving Family Planning and Increasing Access to Safe Water and Sanitation in Rural Communities Project*. The project is supporting small-scale private sector operators who are using three manual well drilling techniques: *Rota Sludge*, *jetting*, and *Madrill*, to construct community water supply points at a fraction of the cost of conventional truck mounted drilling rigs or gravity flow water supply systems.

Results of a hydro-geologic mapping study commissioned by the project to delineate areas suitable for manual drilling technologies concluded that over 40% of the population in the project's target regions could be served using manual well drilling. The study projected that using manual well drilling technologies to supply water to these populations would cost 50% less than conventional technologies. Capitalizing on manual well drilling technologies is thus a cost-effective use of limited government resources and a viable strategy for reducing the funding gap needed to reach the country's MDG for rural water supply.

Manual well drilling techniques will be used to drill over 150 boreholes, providing access to improved water supply to over 30,000 people by the end of the project in December 2009.



PHOTO & CAPTION

Demand Driven Sanitation: Empowering rural communities to take a “step up” the sanitation ladder



Photo: Jonathan E. Annis

Local masons are trained to produce two types of “Sanplat” using moulds made out of locally available materials. The masons are given a “starter kit” (moulds, 100 kg of cement, rebar) at the beginning of the project that allows them to begin producing sanplats. Sanplants are sold at a price which the masons can profitably maintain their small business at the end of the project.



Photo: Jonathan E. Annis

In a handful of communes, masons have set-up high profile workshops close to public gathering places from which to produce and market their products.

While over 50% of the population in Madagascar has access to pit latrines, less than 10% of these can be classified as hygienic sanitation facilities, defined by the WHO as a toilet with a minimum of a washable platform and a drop-hole cover. The absence of sanitation related products and services in remote areas is a primary obstacle to increasing rural access to hygienic sanitation, particularly within segments of the population who are prepared to invest in proper sanitation technology.

Increasing access to hygienic sanitation facilities is a primary goal of the USAID funded *Increasing Access to Safe Water and Sanitation in Rural Communities* project being implemented by the Malagasy association Voahary Salama. Voahary Salama (VS) is increasing sanitation access through a comprehensive approach that simultaneously targets schools, rural health centers and individual households within a community. Implementing partners NGOs use the PHAST methodology to trigger communal behavior change and a network of community health volunteers promote healthy sanitation and hygiene habits to mothers. VS does not subsidize toilet construction, rather encourages households to incrementally take steps up the sanitation ladder using whatever means are available. Poorer families without toilets are encouraged to construct simple pit latrines using local materials; households with traditional pit latrines are encouraged to invest in hygienic latrine slabs. Implementing partners propose different latrine models according to the locally available materials and cultural traditions of the regions.

To facilitate the availability of hygienic latrine slabs in the projects' 26 target communes, VS has trained and equipped more than 70 local masons to produce and market sanitation platforms or “sanplat”. Sanplat is a proven intermediate technology that fits the WHO definition of hygienic and can be installed in both new or existing latrines. The masons produce sanplat locally and market them to households at a price that is affordable yet profitable to the mason. Preliminary reports on the effectiveness of this approach are encouraging. Masons have received orders from more than 50 households in most communes, and parents groups are ordering sanplats to be installed in school latrines. Social marketing techniques are diversifying, with some masons agreeing to share a percentage of profits with a community health volunteer that convinces a household to invest in a sanplat. The project aims to sell 1,400 sanplat by the end of December 2009.