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EVALUATION

Performance Evaluation of Water Interventions in Urban and Rural Areas of Zimbabwe

March 2014

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PERFORMANCE EVALUATION OF WATER INTERVENTIONS IN URBAN AND RURAL AREAS OF ZIMBABWE

MULTIPLE INTERVENTIONS TO IMPROVE WATER SUPPLY

March 25, 2014

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ACRONYMS

ADRA	Adventist Development and Relief Agency
CBO	Community Based Organizations
CDC	Centers for Disease Control
CWPC	Community Water Point Committee
DDF	District Development Funds
DEC	Development Experience Clearinghouse
DIV	Development Innovation Ventures
DRR	Disaster Risk Reduction
DWSSC	District Water and Sanitation Sub-Committee
EAWAG	Eidgenössische Anstalt für Wasserversorgung, Abwasserreinigung und Gewässerschutz (Swiss Federal Institute of Aquatic Science and Technology)
ECHO	European Commission on Humanitarian Aid & Civil Protection
FY	fiscal year
GoZ	Government of Zimbabwe
HCC	Harare City Council
IOM	International Organization for Migration
IMC	International Medical Corps
IQC	Indefinite Quantity Contract
IRC	International Rescue Committee
IRD	International Relief & Development
IWSD	Institute of Water and Sanitation Development
JI	Joint Initiative
JMP	Joint Monitoring Program
KII	key informant interview
lpcd	liters per capita per day
MOU	Memorandum of Understanding
mpcd	minutes per capita per day
MSI	Management Systems International
MVP	Mobile and Vulnerable Populations
NCU	National Coordination Unit
NGO	Non-Governmental Organization
OFDA	Office of U.S. Foreign Disaster Assistance
OIG	Office of Inspector General
PDL	poverty datum line
PROOF I	Peri-urban ROOFtop Rainwater Harvesting in Zimbabwe
PSI	Population Services International

PWSSC	Provincial Water and Sanitation Sub-Committee
RDC	Rural District Committee
RFP	Request for proposal
RWH	rooftop rainwater harvesting
SODIS	solar water disinfection
SOW	Statement of Work
WASH	Water, Sanitation, and Hygiene Promotion
WHO	World Health Organization
USAID	U.S. Agency for International Development
VPM	Village Pump Minder
ZimAHEAD	Zimbabwe Applied Health and Development
ZIMROOF	Zimbabwe Rooftop Rainwater Harvesting
ZINWA	Zimbabwe National Water Authority

EXECUTIVE SUMMARY

EVALUATION PURPOSE AND EVALUATION QUESTIONS

The purpose of this performance evaluation is to examine the extent to which the U.S. Agency for International Development's (USAID) water supply projects have improved water supply infrastructure, increased access to water, and mitigated negative health outcomes associated in target communities. This evaluation examined USAID/Office of U.S. Foreign Disaster Assistance (OFDA)–funded water supply interventions in Zimbabwe from fiscal year (FY) 2009 to FY2012 to determine whether they provided adequate access to improved water during the rainy and dry seasons. Additionally, the evaluation examined the sustainability of water supply infrastructure in various locations, including households and schools.

This evaluation assesses five issue areas encompassing 20 specific evaluation questions with support from information gathered during dry and rainy season field visits (July and December 2013, respectively) and a thorough document review. The five areas are (1) overall performance and impact, (2) efficiency, (3) coverage and design, (4) sustainability, and (5) gender equality and equity.

Key audiences for the evaluation include USAID/OFDA, the USAID Zimbabwe mission, and other institutional donors to Zimbabwe.

PROJECT BACKGROUND

In response to Zimbabwe's critical health status and the degraded state of the country's water infrastructure, USAID/OFDA funded 12 projects related to the Water, Sanitation, and Hygiene Promotion (WASH) sector in schools, hospitals, and clinics across Zimbabwe beginning in 2009 (see Annex VI.

EVALUATION DESIGN AND METHODS

The performance evaluation of USAID/OFDA-funded Zimbabwe WASH interventions consisted of a literature review, a rapid assessment, an inception report, site sample selection, data collection, and analysis. (See Table 1).

Table 1. Summary of Methods

Method	Purpose	Justification
Key informant interviews	Both structured and unstructured to get firsthand information from implementers and stakeholders	Gain depth and insight of the project and bring out the critical issues
Rapid assessment	Observe very limited sample in urban areas	Validate audit findings
Desk study	Review existing reports, documentation, and publications	Review sector "best practices" for benchmarking findings, get oversight of project purpose and progress, and help structure the fieldwork and final report
Household and institution visits	Personally observe what has been done and interview beneficiaries	Verify reported information and judge the reality "firsthand." Observe installed hardware and its compliance with "good practice" standards
Data analysis	Explore and interpret collected data	Determine system characteristics, community behavior, performance trends and project impacts in time

LIMITATIONS[1]

The evaluation team encountered several limitations including:

- Prior to the team's July 2013 site visit, upcoming general elections limited the team's ability to visit rural intervention areas.
- Data collection during the rainy season was delayed due to very little rainfall
- Respondents were not always available at the time of the team's household visits
- Ability to collect samples for water quality analysis was limited by the number of sample bottles available from the CIMAS lab; as a result water quality samples were not collected from boreholes. Annex II describes this limitation and the team's reasoning in more detail.
- The team had to rely on proxy indicators for behaviors given the team's limited time to conduct surveys – e.g. asking people if they have soap for handwashing is a proxy for handwashing behavior.
- Several of the questions on the survey could also be affected by recall bias.

FINDINGS

Overall Performance and Impact: The evaluation team used the established service level ladders shown in Table 2 as a guiding framework to assess the average service levels by type of water source. Indicators included quantity, quality, accessibility and reliability. The service levels evaluation indicates that none of the water sources, on average, provides a basic level of service. Water quality, reliability, and quantity are the areas of particular challenge for the interventions.

The estimated quantities of water obtained from the rooftop rainwater harvesting (RWH) tank per person ranged from 0 to 89 liters per day. People report using more water from USAID-funded RWH tanks in the rainy season (15 liters per person per day) than the dry (11 liters per person per day). The majority of the households perceived the water supply to be good, very good, or excellent.

Overall findings on performance and impact are summarized below:

- The majority of water quality samples (70%) from RWH tanks were of excellent quality (based on local CIMAS and global WHO standards).
- The majority of water quality samples (79%) from protected wells were of unsatisfactory quality in the dry season.
- Almost all of the water quality samples from protected wells and RWH systems were unsatisfactory in the rainy season.
- Only 4% of rural water samples were of excellent or satisfactory quality.
- Regardless of the actual water quality, a high percentage (>93%) of respondents from urban and rural households with RWH systems and protected wells perceived that water was of good quality (i.e. odorless, colorless and good taste) both in the dry and rainy seasons. Benefits brought by the RWH systems to households included: a closer water source to home; the ability to share water with neighbors and to store the intermittent municipal water.
- Specific uses for fetched RWH water included, in descending order: drinking, washing dishes, cleaning the house, laundry, bathing, watering garden, flushing toilet, cooking, construction, and watering livestock.

Efficiency: Based on observations, RWH systems and protected wells in general are not efficient in providing water supply throughout the dry season:

[1] Please reference Annex II for additional information.

- In the dry season, 79 of 142 RWH tanks (56%) in urban areas had no water. At least 18 households (13%) had connected their municipal water tap to the RWH tank.
- One and a half months into the rainy season, it had not rained as much as expected in the weeks preceding the surveys, and as such, no RWH tanks were full. Similarly, out of 22 protected wells visited in the high-density suburb of Epworth, 6 were dry and one was almost dry.

There was no evidence of RWH replication or ability to do so during surveys in urban areas. The team observed some RWH systems in rural areas but these were not modeled on the USAID/OFDA-funded RWH interventions.

- RWH systems cost from US$1,000 to US$13,400 to build, and parts for some types of tanks are not easily available.
- On the other hand, a hand-dug, protected well costs on average about US$400 to rehabilitate (depending on depth), so this intervention is thought to have more potential for replication.

There was good coordination among donors and non-governmental organizations (NGOs), and with government entities, during and immediately after the outbreak. Ongoing coordination or uptake of responsibility by government entities is not apparent however.

Coverage and Design: The coverage was limited to certain households (vulnerable families), which required them to share water. Social problems include neighbors threatening to poison the tank if the RWH household did not share the water, or other pressures to share.

The design, even of the "gold standard" International Relief & Development (IRD) tanks, needs improvement:

- The team observed that 34% of RWH systems were functioning with problems, and 8% were not operational.
- Reported and observed problems with RWH systems include vandalism and theft, of taps in particular; leaking tanks and downpipes; and clogged downfall pipes.
- IRD tanks were designed with a small access hole in the top of the tank. This seems to be a design flaw, since some respondents said there was no easy way to remove sediment from the tank.
- There was an expectation that IRD would come back to fix or clean the tank.

Sustainability: Both RWH systems and protected wells have functionality challenges:

- In both rainy and dry seasons, 58% of the urban household RWH systems were fully functional, 34% were functioning with problems, and 8% were not operational.
- The lack of regular maintenance indicates those systems that are functioning might not provide ongoing services.
- Reported problems included leakage (of tank, tap and gutter), poor water quality, vandalism or theft, and design failure.

Gender Equality and Equity: Beneficiaries of the interventions (household residents) are evenly split between males and females. However, many of the households report using multiple sources, including those away from home, and 60% of the households reported women and/or girls are responsible for fetching water. Thus women and girls still bear more of the burden related to water.

CONCLUSIONS

Overall Performance and Impact: Using an average of results, none of the water system types evaluated provides a basic level of service. The major issues influencing the achievement or non-achievement of the objectives include the following: changes in rain patterns; sharing of water sources; using water for purposes other than drinking or handwashing. The evaluation team determined and compared service levels by type of water source using established service level ladders as a guiding framework[2] (see Table 2 below).

Table 2. Service Levels and Indicators

<table>
<tr><th>Service Level</th><th>Quantity (lpcd)</th><th>Quality</th><th>Accessibility (mpcd)</th><th>Reliability</th><th>Joint Monitoring Program (JMP)</th></tr>
<tr><td>High</td><td>>=60</td><td>Good</td><td><10</td><td>Very</td><td rowspan="3">Improved</td></tr>
<tr><td>Intermediate</td><td>>40</td><td rowspan="2">Acceptable</td><td rowspan="2"><30</td><td rowspan="2">Reliable/Secure</td></tr>
<tr><td>Basic (normative)</td><td>>20</td></tr>
<tr><td>Substandard</td><td>>5</td><td>Problematic</td><td><60</td><td>Problematic</td><td rowspan="2">Unimproved</td></tr>
<tr><td>No service</td><td><5</td><td>Unacceptable</td><td>>60</td><td>Unreliable/insecure</td></tr>
</table>

Regarding impact, the evaluation team discovered during the field visits that many households in urban areas use multiple sources. This unexpected finding made it difficult to determine the contribution of the USAID/OFDA-funded sources to an improved water supply.

Efficiency: The program design of providing RWH systems for certain households led to inefficient provision of water for households during the dry season because of sharing. More households use the RWH systems than designed for and so tanks run dry about two to four months into the dry season.

- Some households seemed happy to share the water with their neighbors but others had conflicts with their neighbors, or could not prevent access to the tank.
- Schools are able to better control the use of the water from the tanks, but RWH water supply does not get them through the dry season. This probably is due in part to the use of the water for purposes not planned for in the design, such as watering gardens and cleaning school latrines.
- In general there was good coordination among the NGO partners during the implementation phase, particularly around RWH best practices. There was also good coordination with the government during the implementation phase.

Coverage and Design: The method of providing water interventions to only the selected households in each suburb or village, typically those with vulnerable residents, left many households without direct access to the additional water source provided by the USAID/OFDA-funded interventions**.** For this reason, the storage volume needed for the design would have been difficult to predict.

- Most partners assumed that RWH tanks built during their programs would be full in the rainy season but dry up in the dry season. However, the reality is that more households use each RWH system than designed for and so the tanks run dry about two to four months into the dry season.
- Sharing has a strong impact on the amount of water available through the dry season. Some households seemed happy to share the water with their neighbors but others experienced conflicts
- Because the RWH tanks are located outside the house and visible to the neighbors, households without a lockable fence or tap could not prevent neighbor's access to their tank. Vandalism or theft of RWH system parts was reported in 15% (rainy) and 16% (dry) of the households.

[2] As described in "Ladders for Assessing Water Service Delivery," IRC WASH Cost working paper, 2011. Available at http://www.washcost.info/page/753

Sustainability: The types of water systems evaluated are generally not sustainable, due to the lack of maintenance and inability or unwillingness to repair systems.

Gender Equality and Equity: It is reasonable to assume that the whole household, including women and girls are receiving the same benefits from the interventions. However, when they are not, women and girls are still disproportionately burdened with fetching water from other sources.

RECOMMENDATIONS

Several key strategic and tactical recommendations are provided below. An exhaustive list of strategic and tactical recommendations can be found on page 64.

Overall Performance and Impact:

- Given that the overall performance (in terms of service levels) is poor, USAID/OFDA should ensure its partners conduct all water infrastructure interventions, even in emergencies in a manner that considers how to provide ongoing services. ***(Strategic)***
- USAID/OFDA should facilitate capacity for a management structure whether it be community-based, private sector, local government, or a combination. ***(Tactical)***

Efficiency:

- USAID/OFDA and implementing partners should select the most efficient water supply model for the context using the concepts of the Technology Applicability Framework[3]. ***(Strategic)***
- Unless implementing partners can provide evidence of a design that works well in rural areas, USAID/OFDA should only consider funding RWH in a peri-urban setting closer to markets for parts, artisans for building and rooftops adequate for water collection. ***(Tactical)***

Coverage and Design:

- USAID/OFDA could address poor functioning systems by funding water supply programs that ensure full coverage in a defined geographic area (e.g., a suburb, rural village). ***(Strategic)***
- USAID/OFDA-funded NGOs should consider construction guarantees (ideally for 5 years) with their contractors or performance-based contracts since the collapsed well linings seemed to be related to poor construction. ***(Tactical)***

Sustainability:

- USAID/OFDA should consult with one of the development banks or the African Council of Ministers of Water on ways to provide support to DDF on the budgetary front if they are to effectively undertake their mandate (IMC, 2013). ***(Strategic)***
- In many cases, the most cost-effective intervention would be for USAID/OFDA to fund its implementing partners to facilitate the repair of broken down pumps and maintenance training. A revolving fund/access to micro-credit/savings mechanisms could be put in place to provide necessary monies to buy spare parts when the time arises. ***(Tactical)***

Gender Equality and Equity:

- USAID/OFDA should utilize evidence-based "next practices" for mainstreaming gender issues into the designing, planning, and maintenance stages of OFDA-funded projects to ensure that appropriate and sustainable systems are in place. ***(Strategic)***
- USAID/OFDA should use common indicators across all programs to allow for comparison of methods and results, both among USAID-funded programs and with programs funded by other donors. That way, it will be possible to determine which methods are most successful, and can thus be scaled up. ***(Tactical)***

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[3] http://www.irc.nl/page/80150

EVALUATION PURPOSE AND EVALUATION QUESTIONS

EVALUATION BACKGROUND

USAID/OFDA awarded $335,618 to Social Impact, through Task Order AID-OAA-TO-13-00024 under the Evaluation Services Indefinite Quantity Contract (IQC), to conduct a performance evaluation of water supply projects implemented by USAID/OFDA in Zimbabwe since FY2009. The one-year contract occurred between March 25, 2013 and March 25, 2014. The team conducted a rapid assessment in April 2013 as an urgent response to a recent audit finding, commenced data collection for the dry season in June 2013, and completed rainy season data collection in January 2014. The SI headquarters team of Dennis Wood, James Fremming, Patrice Howard, and Michele Wehle provided additional logistical and technical support throughout fieldwork and report writing.

The evaluation team consisted of Team Leader and Evaluation Specialist Ms. Susan Davis; Water Supply Expert Mr. Gift Manase, later replaced by Mr. Lawrence Nyagwambo, for rainy season data collection; two Evaluation Project Specialists, Mr. David Bonnardeaux and Dr. Jaison Chireshe; and National Project Evaluation Specialist Mr. Roy Mutandwa.

EVALUATION PURPOSE

The purpose of this performance evaluation is to examine the extent to which USAID's water supply projects have improved water supply infrastructure, increased access to water, and mitigated negative health outcomes associated in target communities. This evaluation examined OFDA-funded water supply interventions in Zimbabwe from FY2009 to FY2012 to determine whether they provide adequate access to improved water during the rainy and dry seasons. Additionally, the evaluation examined the sustainability of water supply infrastructure in various locations, including households and schools. This report provides answers to the 20 key evaluation questions, drawing on results from the dry and rainy season field visits (July and December 2013, respectively) and document review.

The evaluation was conducted in response to findings and recommendations from an audit of the OFDA activities in Zimbabwe (Office of Inspector General, 2012). The Regional Inspector General/Pretoria conducted the audit to determine whether USAID/OFDA activities in Zimbabwe were achieving its goal of mitigating the effects of the country's complex emergency. The audit determined that the project was mitigating the ongoing effects of the complex emergency in Zimbabwe. Specifically, the digging of wells and, to a lesser extent, the construction of RWH tanks increased the availability of clean drinking water; the promotion of sanitation and hygiene increased awareness of the risks of disease; the introduction of chlorine water treatment products such as WaterGuard began to provide a commercially available product for households to use to treat their water; and the distribution of inputs and promotion of conservation farming resulted in increased food availability (Office of Inspector General, 2012).

However, the audit noted that OFDA does not have a systematic way to determine whether its activities are working. According to the audit, "Because it provides disaster relief, OFDA has been exempted from having performance monitoring plans. Yet for long-term risk reduction programming, it needs a monitoring and evaluation system to guide strategic decisions about activities in Zimbabwe and to measure their effectiveness." To address this issue, the audit recommended that USAID/OFDA:

1. Conduct an independent evaluation of key programmatic decisions regarding the complex emergency in Zimbabwe to determine whether OFDA is allocating resources to projects that are demonstrating meaningful results.
2. Develop a timeline for the implementation of a monitoring and evaluation system for its disaster risk reduction activities in Zimbabwe.

Specific decisions that could be informed by this evaluation include improving methodology for future emergency and non-emergency WASH interventions in Zimbabwe and elsewhere and determining appropriate future funding levels.

Key audiences for this evaluation include USAID/OFDA, the USAID Zimbabwe mission, and other institutional donors to Zimbabwe.

EVALUATION QUESTIONS

This evaluation assesses five issue areas, with specific evaluation questions as follows:

Area I. Overall Performance and Impact

1. What is the overall performance of the USAID/OFDA–funded water supply projects in Zimbabwe implemented since FY2009?
2. To what extent were the stated strategic objectives of increasing access to improved water supply in Zimbabwe achieved? What were the major issues influencing the achievement or non-achievement of the objectives?
3. What is the current quality and quantity of water available from the water supply interventions in different seasons and for how many people?
4. What are the most significant results these water supply projects have delivered to both direct and indirect beneficiaries since FY2009?
5. Is there evidence that the water supply projects were associated with cholera prevention or mitigation?
6. Is there evidence that the water supply projects were associated with drought mitigation?
7. What evidence is available that demonstrates the RWH activities have been replicated or may be replicated in the future?

Area II. Efficiency

8. Are the RWHs in Zimbabwe efficient in providing a reliable water source to households year-round? How does this compare to wells in the same communities?
9. Are the RWHs in Zimbabwe cost-effective for households and institutions? Please stratify findings by households, schools and clinics. How does this compare to wells in the same area?
10. Were the water supply interventions funded by USAID/OFDA in Zimbabwe well coordinated with other donors to avoid duplication of effort?

Area III. Coverage and Design

11. Assess the appropriateness and success of the design of the different USAID/OFDA–funded RWHs implemented in Zimbabwe in various locations, including urban vs. rural settings of

households, schools, and health facilities. The assessment will include, but is not limited to, the size and construction quality of tanks, gutters, piping, taps, and roofs.

12. Assess how replicable the current designs of the RWH systems are in Zimbabwe. The RWH systems were intended as "demonstration" systems that could be made replicable if a low-cost design were perfected and demonstrated. Will households, schools, or health facilities be able to afford to construct similar systems without foreign aid?
13. Assess the storage volume constructed for each household, school, and health clinic. Was the storage volume designed appropriately? Would a different storage volume be more replicable and still reduce cholera risks?
14. Was vector control required at the water supply site and, if so, how well did it function?

Area IV. Sustainability

15. Are the water supply interventions currently operational? If not, why?
16. What support is available within the community, school, or health facility for maintaining the water supply intervention?
17. How does the sustainability compare between RWH, boreholes, shallow wells, and spring boxes?
18. What assumptions and/or challenges related to the policy and enabling environment of Zimbabwe will likely affect sustainability of the RWH, boreholes, shallow wells, and spring boxes?

Area V. Gender Equality and Equity

19. Did the water supply projects ensure the involvement of women and assist men and women equally?
20. What additional steps might the water supply projects in Zimbabwe undertake to improve gender equity and equality?

PROJECT BACKGROUND

In 2008, the population of Zimbabwe suffered under the simultaneous collapse of the country's economy, health system, and water and sanitation infrastructure. While many provinces had undergone flooding during the previous rainy season, other provinces were affected by severe drought, both of which resulted in severe food insecurity. In addition, a cholera outbreak that began in August of 2008 spread rapidly across the country due to widespread fecal contamination of surface water sources and shallow wells, as well as poor sanitation and hygiene practices.

This complex emergency was further exacerbated by political violence during the 2008 presidential and legislative elections, which displaced some 30,000 people, according to the United Nations Office for the Coordination of Humanitarian Affairs. From August 2008 to July 2009, Zimbabwe's poorly maintained water and sanitation infrastructure and fragile health system led to 98,600 cases of cholera, resulting in nearly 4,300 deaths, concentrated primarily in Mashonaland West, Central, and East; Harare, Manicaland, Masvingo, Matabeleland South, and Bulawayo (Office of Inspector General, 2012).

In response to the population's critical health status and the degraded state of Zimbabwe's water infrastructure, USAID/OFDA funded 12 projects related to the Water, Sanitation, and Hygiene Promotion (WASH) sector in schools, hospitals, and clinics across Zimbabwe beginning in 2009 (see Figure 1). These programs aimed to increase access to improved water supplies through rainwater harvesting (RWH), new boreholes, and rehabilitation of existing wells and spring boxes.

By 2012, many Zimbabweans were enjoying improved humanitarian conditions, but significant needs and vulnerabilities remained. Following a decade of economic deterioration, poorly maintained infrastructure continues to limit adequate access to health care and WASH, as well as to contribute to poor hygiene practices. Underlying risk factors still persist in Zimbabwe, including water-borne disease and food insecurity.

In decentralizing responsibility for water sources to provincial authorities, there has not been an effective and concomitant transfer of resources to fulfill their mandate. As a result, boreholes are breaking down and not being rehabilitated in a timely fashion or at all. Municipal water is also being affected due to resource constraints, with households going for weeks without any tap water. As a result, people do not pay their water fees, leaving the water utility in arrears. This vicious cycle has therefore created a need for alternative sources of water provision in the short and medium term.

It is also clear that a lack of resources at the central government level poses an ongoing challenge to the provision of safe and reliable water services. This lack of resources is creating a cascade of problems down to local authorities. A third of rural Zimbabweans still drink from unprotected water sources, and a typhoid outbreak in urban informal settlement areas around Harare in early 2012 and localized cholera outbreaks in May 2012 occurred because of poor WASH and health infrastructure. USAID/OFDA disaster risk reduction (DRR) programming in the WASH sector seeks to mitigate these ongoing vulnerabilities. Since the cholera outbreak, USAID/OFDA WASH programs have transitioned from humanitarian response to recovery and DRR.As part of the continued transition, USAID/OFDA DRR programs in the WASH sector have increasingly focused on RWH to provide increased access to improved water during periods of either drought or high risk from water-borne disease. This programming seeks to mitigate ongoing vulnerabilities to drought, food insecurity, and water-borne diseases. As part of this transition, the programs increasingly have focused on RWH to provide increased access to improved water during periods of drought and high risk of water-borne disease.

PROGRAMS FUNDED BY USAID/OFDA

Since 2009, USAID/OFDA has funded the following projects:

- The WASH-Focused Disaster Risk Reduction Initiative implemented by the International Rescue Committee (IRC) to rehabilitate deep and shallow wells and construct RWH systems in 30 schools.
- The Zimbabwe ROOFtop and Peri-urban ROOFtop Rain Water Harvesting projects managed by IRD, with the objective of installing RWH systems in households and schools across Zimbabwe.
- The Rural Water Supply and Treatment Infrastructure and Hygiene Promotion projects implemented by Medair in 2011 and 2012 promoted the construction of new shallow hand-dug wells protected and fitted with hand pumps, the rehabilitation of existing protected wells, and the construction of rainwater harvesting tanks in schools.
- The NGO Joint Initiative for Urban Zimbabwe with Mercy Corps to improve WASH conditions in urban areas and increase communities' resilience to WASH-related shocks such as disease outbreaks by installing water harvesting systems in 83 households and 22 institutions.
- The Public Health Program for Urban Humanitarian Crisis implemented by Oxfam is designed to reduce vulnerability of at-risk urban and peri-urban populations to water-related disease through the installation of 20 water tanks in clinics in the most affected areas for rainwater harvesting, the rehabilitation of 20 boreholes, and the protection of 100 shallow wells.
- The Livelihoods Recovery Thru Agriculture, Water, Sanitation and Health Interventions program, also implemented by Oxfam, is designed to mitigate water-related disease through 200 borehole emergency repairs, 20 elephant pumps, 20 rainwater harvesting systems, 20 bio-sand filters, 250 households with SODIS (solar water disinfection), 20 urban wells protected and 75 tool kits for long-term operation and maintenance of water sources.

NGO partners that have received funding from USAID/OFDA to implement water supply programs include Adventist Development and Relief Agency (ADRA), Concern, GOAL, International Medical Corps (IMC), International Organization for Migration (IOM), IRC, IRD, Medair, Mercy Corps, and Oxfam. Locations of programming, as shown on the map in Figure 1, include the following:

- Bulawayo Province-Bulawayo District
- Harare Province
- Midlands Province
- Manicaland Province
- Mashonaland East Province
- Mashonaland West Province
- Mashonaland Central Province
- Masvingo Province

Figure 1. Locations of USAID DRR Projects in the WASH Sector

Water supply projects funded by OFDA in Zimbabwe used several different approaches, including new boreholes, rehabilitated boreholes, rehabilitated spring boxes, and RWH systems. Overall, these projects were carried out for approximately 900 households, 80 schools, and 40 clinics nationwide. Annex VI provides further detail on the USAID/OFDA–funded programs in Zimbabwe.

EVALUATION METHODS AND LIMITATIONS

The evaluation team conducted a performance evaluation that assessed the effectiveness and sustainability of various water supply intervention approaches—rehabilitated protected wells and RWH systems—in meeting both the water access and health objectives during both the rainy and dry seasons. The evaluation of USAID/OFDA–funded Zimbabwe WASH interventions consisted of a literature review, a rapid assessment, an inception report, site sample selection, data collection, and analysis. This section outlines each element in more detail.

LITERATURE REVIEW

The evaluation team conducted a thorough and targeted literature review of all USAID/OFDA–funded project documents, including USAID award documents, baseline surveys, needs assessments, and final reports. In addition, the team requested program reports, including evaluations, from the NGO partners. Reports were reviewed for data, conclusions, and recommendations relevant to the five main issues stated in the request for proposal (RFP), including (1) overall performance and analysis, (2) efficiency, (3) coverage and design, (4) sustainability, and (5) gender equality and equity. This literature review provided the evaluation team with pertinent information for the time-sensitive rapid assessment and the formulation of the inception report. Final reports also provided quantitative data on project achievements that could be used for comparative analysis of evaluation results. Please see Annex IV for a full list of documents reviewed.

RAPID ASSESSMENT

The evaluation team members located in Zimbabwe visited communities near Harare where NGOs and implementing partners had installed RWH units. The purpose of these visits was to assist USAID with an urgent need to respond to an audit finding by May 1, 2013. The visits occurred over a two-week period from April 2–13+, 2013. Team members performed a rapid assessment using questions from the Coverage and Design category of the evaluation questions to assess the appropriateness and success of the design of the different USAID/OFDA–funded RWH systems implemented in Zimbabwe in various locations, including only urban households and schools. The assessment included, but was not limited to, the size/volume and construction quality of tanks, gutters, piping, taps, and roofs; existence of vector control; and efficacy of maintenance. Both key informant interviews (KIIs) and site visits were conducted. Qualitative information was also gleaned from the water infrastructure projects to assess the extent to which they have achieved the desired objectives. The preliminary findings, which can be found in the accompanying Inception Report document, informed the design of the full evaluation.

INCEPTION REPORT

The evaluation team compiled an Inception Report, outlining the evaluation plan and including detailed methodology for sampling and data collection. This Inception Report was subjected to a critical discussion process by SI and USAID staff in order to ensure all expectations for the evaluation were met.

SITE SAMPLE SELECTION

USAID/OFDA funded interventions through 10 partners with 16 projects, resulting in approximately 1,000 water points that spanned south, central and eastern Zimbabwe, in rural, peri-urban, and urban locations. The evaluation team faced the challenge of evaluating a variety of interventions in a very limited timeframe; variables included the following:

- Type of WASH intervention (e.g., RWH systems, protected wells, and boreholes)
- NGO partner—there were several implementing partners with varying policies and capacities
- Type of ward (e.g., peri-urban, urban, rural)
- Climatic conditions (e.g., drought-prone southern districts, dry and rainy seasons)
- Year of implementation—some projects had installed tanks/protected wells as early as 2009, while others were just concluding operations in 2013

Given that the interventions to evaluate were spread across the country, the evaluation team had to balance the need for in-depth data collection from a representative number of communities with the time and resources available under the contract. SI took a random sample from a subset of sites for evaluation, from urban/peri-urban and rural sites, during both the rainy and dry seasons. Peri-urban and urban sites in Harare, and rural sites in Manicaland, were chosen as there were relatively more USAID/OFDA–funded interventions undertaken in these areas by various NGOs (including Mercy Corps, IRD, IRC, and Oxfam) requiring less travel and time to visit and administer questionnaires. The specific sites visited were selected to be representative of the urban and rural interventions across the country.

To the extent that the security situation allowed, SI believed it important to visit the communities that were remote (i.e., far from a main road) because the sustainability of those projects would potentially be at greatest risk. There are two main reasons for this: (1) remote communities have less access to town and NGO staff, hardware stores, plumbers, etc., and are less likely to have networks that can provide support in finding solutions to problems as they arise; and (2) the less extensive NGO presence in remote communities means less training and less follow-up to ensure proper use of the installed systems. Sites in Manicaland Province (Mutasa and rural Mutare districts) served that purpose.

SAMPLING PROCEDURE

SI sampled water systems including RWH systems, rehabilitated protected hand-dug shallow wells, and boreholes with reservoir tanks. Water quality samples were collected from a subset of RWH and rehabilitated protected hand-dug shallow wells and analyzed for presence of fecal coliform. Water quality samples were not collected from boreholes due to a limitation on the number of water samples that the CIMAS laboratory would allow to be collected at one time. Of the water intervention types, boreholes are the least seasonally dependent, thus the team decided to focus on RWH and protected wells. Annex II describes this limitation and the team's reasoning in more detail.

Table 3 displays the sample size and total number of each type of intervention (boreholes with storage tanks, spring wells, hand pumps with shallow wells, protected shallow wells, and RWH)[4], by school/institution and household. The *surveyed* column indicates how many of those types of interventions were surveyed during the site visits.

Table 3. Survey Sample Sizes

Intervention Type	Infrastructure Number	Estimated Schools/ Institutions	Surveyed	Estimated Households	Surveyed
Boreholes and storage tanks	**430**	3	**9**	28,763	**0**
Spring wells	**6**	0	**0**	267	**0**
Hand pumps and wells	**150**	0	**0**	5,432	**0**
Protected shallow wells	**1,121**	4	**0**	>37,606	**60**
RWH	**1,060**	130	**10**	1,764	**145**
TOTAL	**2,767**	137	**19**	73,832	**205**

Due to resource and time constraints (i.e., limited resources to cover geographically dispersed intervention communities across the country), the evaluation team chose to utilize a multi-stage

[4] A well (protected or unprotected) can have a windlass and bucket or a handpump to extract water. Here the protected shallow wells refer to those with windlass and bucket that were evaluated. Shallow wells with handpumps were not included in the evaluation.

sampling approach to obtain a representative sample of households, schools, and clinics serviced by USAID/OFDA interventions. The multi-stage sampling approach is a complex variant of cluster or convenience sampling by which the population of interest is sectioned off into groups and different groups are subsequently chosen at random at various stages to be included in the study. For the purposes of this study, the units of analysis, which includes households, schools, and clinics, are located within districts and across wards within each district. Given that the wider breadth of USAID/OFDA interventions are located in Harare, the team was able to limit the study area to Harare and still obtain a representative sample.

After gathering geographic information, the evaluation team first sampled at the district level and then at the ward level. The team identified all USAID/OFDA WASH interventions at the ward level and randomly sampled from those interventions. To select households, the team followed an agreed-upon walking pattern, using the intervention site as the focal point. More information about the sampling technique is available in the accompanying Inception Report.

Table 4 shows the towns that the evaluation team visited in rainy and dry seasons and the distribution of urban/rural, type of water source, implementing NGO, and schools vs. households.

Table 4. Locations Visited for Surveys

Suburb/ Town	Urban/Rural	Households	Implementer	Type	Schools/ Institutions	Implementer	Type	TOTALS
Budiriro	Urban	2	IRD	RWH	2 1	Oxfam IRD	Storage tanks RWH	**5**
Chitungwiza	Urban	57	IRD	RWH	–	–		**57**
Glenview	Urban	5	IRD	RWH	2	Oxfam	Borehole/ storage tank	**7**
Mabvuku	Urban	70	IRD	RWH	–			**70**
Mbare	Urban	6	IRD	RWH	5	Oxfam	Various[5]	**11**
Tafara	Urban	5	IRD	RWH	1	IRD	RWH	**6**
Epworth	Urban	22	Oxfam	Wells	–			**22**
Mutasa	Rural	24	IRC	Wells	5	IRC	RWH	**29**
Mutare	Rural	14	Mercy Corps	Wells	3	Mercy Corps	RWH	**17**
TOTAL		**205**			**19**			**224**

[5] Types of water sources include three storage tanks (reservoirs), one tank connected to borehole, and one tank connected to municipal tap.

Table 5 shows the locations where the evaluation team collected water samples for laboratory testing.

Table 5. Water Samples Collected: Dry and Rainy Seasons[6]

Season	Urban/ Rural	Location	Source	Number of Samples
Rainy	Urban	Epworth	Protected well	**15**
Rainy	Urban	Mabvuku	RWH	**10**
Rainy	Urban	Chitungwiza	RWH	**4**
Rainy	Rural	Mutare	Protected well	**15**
Rainy	Rural	Mutare	RWH	**3**
Rainy	Rural	Mutasa	RWH	**4**
Rainy	Rural	Mutasa	Protected well	**11**
Dry	Urban	Epworth	Protected well	**8**
Dry	Urban	Mabvuku	RWH	**17**
Dry	Rural	Mutare	Protected well	**14**
Dry	Rural	Mutasa	RWH	**2**
Dry	Rural	Mutasa	Protected well	**11**
			TOTAL	**114**

DATA COLLECTION

Data collection methods included:

- Key informant interviews (KIIs)
- Surveys and observations of the installed infrastructure at households and schools

The evaluation considered the present-day status and impacts of WASH infrastructure in both the rainy and dry seasons. Rainy season in Zimbabwe usually begins in early to mid-November and lasts until early April. Thus two site visits to the same locations were planned, one in July 2013 (hot dry season) and a second in December 2013 (rainy season).

Key Informant Interviews

Semi-structured interviews were administered to key stakeholders, including:

- NGO implementing partners
- Parastatal WASH Organizations (IWSD, NCU)
- Provincial Water and Sanitation Sub-Committees

[6] Water quality samples were not collected for boreholes due to the limited number of sample bottles available from the CIMAS lab. Appendix II describes this limitation and the team's reasoning in more detail.

- District Water and Sanitation Sub-Committees

Key informant interviews were designed to collect as much pertinent information around the five main issues stated in the RFP, including (1) overall performance and analysis, (2) efficiency, (3) coverage and design, (4) sustainability, and (5) gender equality and equity. Given the emphasis placed on rainwater harvesting systems by USAID/OFDA in direct response to the Office of Inspector General (OIG) audit, the evaluation team chose to focus primarily (but not exclusively) on these interventions. Annex III contains the interview questions.

Surveys and Observations

The evaluation team visited households and schools to observe USAID/OFDA–funded water infrastructure and to interview household members or school representatives. The evaluation team utilized a multi-stage sampling approach to obtain a representative sample of households, schools, and clinics serviced by USAID/OFDA interventions. A detailed description of this sampling approach is described in the accompanying Inception Report and under the Sampling Procedure subheading of this report. Annex III contains examples of data collection tools.

ANALYSIS

The evaluation team compared the effectiveness of the USAID/OFDA–funded projects to the effectiveness of projects funded by other donors through qualitative analysis. This was done by comparing the results for USAID/OFDA projects from this evaluation to existing recent evaluations of water programs supported by other donors in Zimbabwe. This cost-effective approach was necessary because it required an analysis of peer-reviewed literature and evaluation reports rather than collecting data via site visits to other donors' projects, which was not feasible given the time and budget.

Annex VIII shows the evaluations of WASH programs in Zimbabwe identified to date that were used for this comparison.

SI used established service level ladders as a guiding framework to assess the average service levels[7] by type of water source (see Table 6). These levels provide greater specificity than the Joint Monitoring Program (JMP) definitions of "improved" or "unimproved" water points (WHO and UNICEF, 2013). This allows for a simple comparison of the quality of current services for constructed RWH systems and protected wells.

[7] As described in "Ladders for Assessing Water Service Delivery," IRC WASH Cost working paper, 2011. Available at http://www.washcost.info/page/753

Table 6. Service Levels and Indicators

<table>
<tr><th>Service Level</th><th>Quantity (lpcd)</th><th>Quality</th><th>Accessibility (mpcd)</th><th>Reliability</th><th>JMP</th></tr>
<tr><td>High</td><td>>=60</td><td>Good</td><td><10</td><td>Very</td><td rowspan="3">Improved</td></tr>
<tr><td>Intermediate</td><td>>40</td><td rowspan="2">Acceptable</td><td rowspan="2"><30</td><td rowspan="2">Reliable/Secure</td></tr>
<tr><td>Basic (normative)</td><td>>20</td></tr>
<tr><td>Substandard</td><td>>5</td><td>Problematic</td><td><60</td><td>Problematic</td><td rowspan="2">Unimproved</td></tr>
<tr><td>No service</td><td><5</td><td>Unacceptable</td><td>>60</td><td>Unreliable/insecure</td></tr>
</table>

Each indicator is defined below (IRC, 2011):

- **Quantity** is the simplest indicator conceptually and the most commonly used for monitoring and comparing between services. It is typically measured in terms of liters per capita per day (lpcd). For schools, the evaluation team used five liters per person per day for all schoolchildren and staff as the quantity for basic service as recommended by the WHO for schools in low-cost settings (Adams, Bartram, Chartier, and Sims, 2009).
- **Quality** refers to both microbial and chemical quality of the water, including a number of different sub-indicators (i.e., biological contamination and several physical parameters). For this evaluation, the team used water quality samples and national norms for fecal coliform to determine the service level.
- **Accessibility** refers to the ease with which people can get water. A key indicator for this is time per day spent fetching water, as it incorporates a number of traditional barriers to reducing access, such as distance and waiting time. This can be measured in minutes per capita per day (mpcd).
- **Reliability** refers to the extent to which the service performs according to expectations. This evaluation used observed functionality (operational status) to determine reliability. Typically this is expressed as the percentage of time that the service is (not) fully functional.

An acceptable level of service is one that meets agreed norms for each of the four key indicators. Turning this mix of indicators into a single objectively identifiable aggregate indicator can be complex. However, one simple way to deal with the mix is to say that the level of service accessed by a person is set by the level of the lowest individual indicator. That is, a person spending an hour a day taking 30 lpcd from a reliable borehole of acceptable quality would have access to a substandard service due to the time required, despite other indicators suggesting a basic service (IRC, 2011).

The service level methodology is relatively new, so past evaluations did not use it. Therefore, qualitative comparison of results to other existing evaluations provided information on how USAID/OFDA–funded interventions performed relative to other donors' programs. Annex VII summarizes these results. Key findings from other evaluations are shared in the relevant sections.

During rural and urban site visits in the rainy and dry seasons, the evaluation team collected water quality samples from a subset of the sites surveyed and analyzed the samples for presumptive coliform and fecal coliform at the CIMAS laboratory in Harare.

The evaluation team conducted descriptive statistical analysis on data collected with the surveys using Microsoft Excel; this included determination of the frequency of responses where multiple options were available. For open-ended questions, the evaluation team evaluated all answers and coded them into categories. For quantitative data, the evaluation team compared the average results for type of water infrastructure (RWH, protected wells, and other), location (urban and rural), and season (rainy and dry).

LIMITATIONS

The evaluation team encountered several challenges that are important to note. In the data collection phase, the upcoming general elections prior to the team's July 2013 site visit limited its ability to visit rural intervention areas. In addition, data collection during the rainy season was delayed due to very little rainfall, and respondents were not always available at the time of the team's household visits. The team's ability to collect samples for water quality analysis was limited by the number of sample bottles available from the CIMAS lab (only 30 at a time).

Self-reporting bias and recall bias were other limitations the team needed to manage. Regarding self-reporting bias, proxy indicators were used to measure a condition that is related to the behavior of interest, such as handwashing. Although these indicators only provide an estimation of actual behavior, the team relied on these indicators given its limited time to conduct surveys. Several of the questions on the survey could also be affected by recall bias, which is a systematic error caused by differences in the accuracy or completeness of the recollections by study participants regarding events or experiences from the past. Additional information regarding the limitations to the evaluation is in Annex II.

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The following section synthesizes the evaluation team's key findings, conclusions, and recommendations. Each section is organized by the evaluation's five topical areas: (1) overall performance and impact, (2) efficiency, (3) coverage and design, (4) sustainability, and (5) gender equality and equity.

FINDINGS

Area I. Overall Performance and Impact

1. What is the overall performance of the USAID/OFDA–funded water supply projects in Zimbabwe implemented since FY2009?

The evaluation team used service level indicators of water quality, quantity, accessibility, and reliability to determine the overall performance of the interventions.

Overall findings on performance and impact are summarized below:

- The majority of water quality samples (70%) from RWH tanks were of excellent quality (based on local CIMAS and global WHO standards).
- The majority of water quality samples (79%) from protected wells were of unsatisfactory quality in the dry season.
- Almost all of the water quality samples from protected wells and RWH systems were unsatisfactory in the rainy season.
- Only 4% of rural water samples were of excellent or satisfactory quality.

- Regardless of the actual water quality, a high percentage (>93%) of respondents from urban and rural households with RWH systems and protected wells perceived that water was of good quality (i.e. odorless, colorless and good taste) both in the dry and rainy seasons. Benefits brought by the RWH systems to households included: a closer water source to home; the ability to share water with neighbors and to store the intermittent municipal water.
- Specific uses for fetched RWH water included, in descending order: drinking, washing dishes, cleaning the house, laundry, bathing, watering garden, flushing toilet, cooking, construction, and watering livestock.

2. To what extent were the stated strategic objectives of increasing access to improved water supply in Zimbabwe achieved? What were the major issues influencing the achievement or non-achievement of the objectives?

The evaluation team surveyed households regarding which water sources they used most in the rainy and dry seasons and how long it took to walk to each source, collect water, and return home (dry season only).[8] Most households used multiple sources. Urban households used sources beyond the RWH, including another tank, boreholes, protected or unprotected shallow wells, and household taps (municipal water supply). (See Table7.)

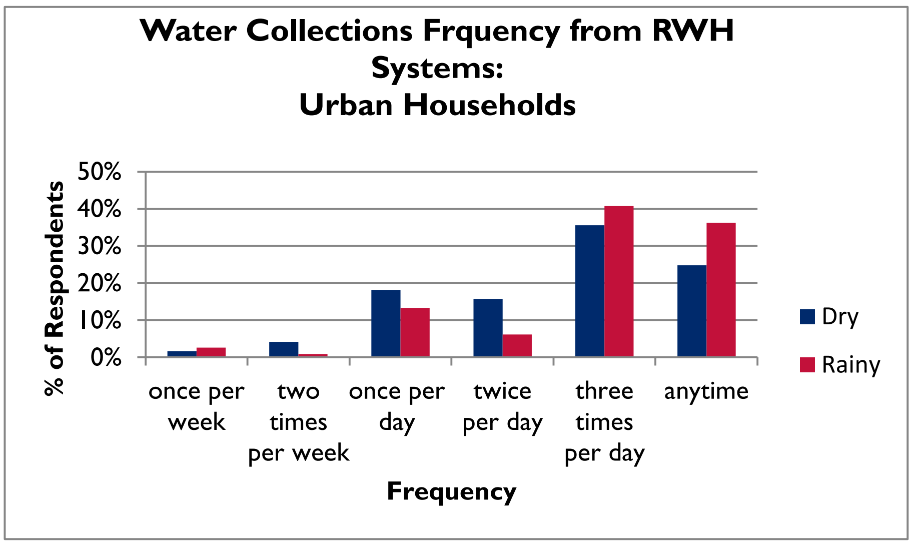
Table 7. Water Collection Times (Round Trip) by Water Source: Urban Households

		Round-Trip Time (mpcd)		
Water Source	***n***	**Average**	**Min**	**Max**
RWH	**41**	6	0	120[9]
Other tank	**4**	25	1	120
Borehole	**55**	151	1	1075
Protected well	**45**	26	1	180
Unprotected well	**21**	31	2	180
Household tap (municipal)	**44**	13	0	60

[8] During the first visit, the team asked the question regarding what sources they used most in both rainy and dry seasons. The team did not ask this question twice because we didn't expect their answers to change. Copies of dry & modified rainy questionnaires are in Annex III.. See Questions C3 & C4 on the dry season household survey
[9] This one data point is likely a mistake by the surveyor, given that the RWH tank is in the front yard.

When urban households were queried about how often they collect water from functioning RWH systems, the most frequent response was three or more times per day in both the rainy and dry seasons (see Figure 2). A larger number of respondents reported this frequency of water collection in the rainy season than dry season. Due to budget and time constraints the evaluation team could only afford to focus its efforts on one rural area: Manicaland Province. It was chosen given its relative accessibility and the fact that three different USAID/OFDA–funded projects were implemented in the area. Nevertheless, the NGO partners did not put in place any RWH systems in households in the rural areas in question given the inappropriate roofing material found there.

Figure 2. Reported Frequency of Water Collection from RWH Systems: Urban Households



3. What is the current quality and quantity of water available from the water supply interventions in different seasons and for how many people?

Findings for quantity and quality are described separately in the following sections.

a. Quantity

The household and school surveys asked, "How much water do you collect from the system per day?" or "How much water do you collect from the well per day?" To determine quantity per person, the evaluation team divided the quantity collected within the household by the reported household size, or the reported number of students. Table 8 shows a summary of quantities of water collected from USAID-funded interventions. The *n* values do not necessarily match the number of households or schools visited and vary between dry and rainy season because a) while the evaluation team visited the same households and schools in the rainy and dry season, the team was unable to find representatives on some visits; and/or b) the interviewee was unable to estimate the amount of water used per day or provide the number of residents/students.

From qualitative information gathered during data collection, the evaluation team noted that several households share their water with one or more other households, either regularly or in cases of water scarcity. However, it was not realistic to obtain comprehensive information on how many other households share the water and how much they collect per day. Household sharing could reduce the actual per-person quantities reported.

Table 8. Average Quantity Collected by Type of Water Source

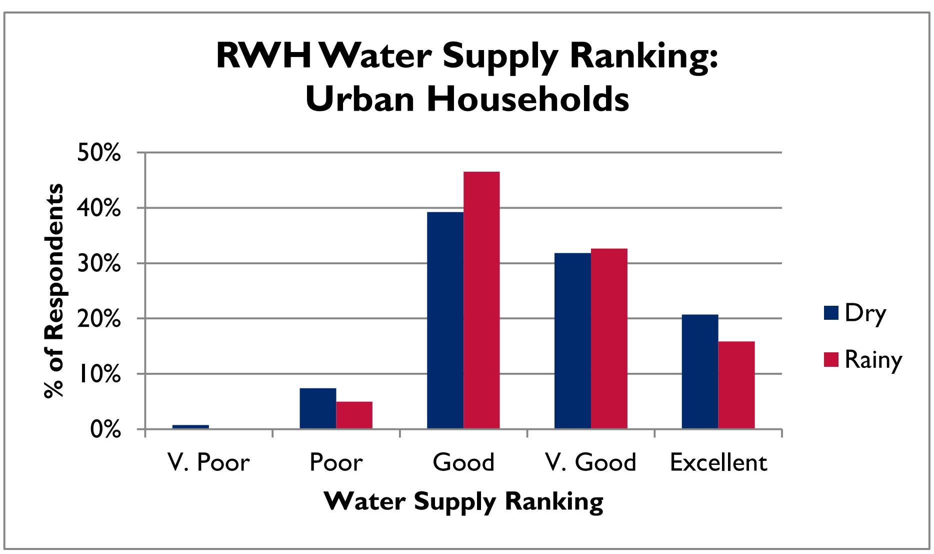
Location	Average Quantity Collected from Intervention (lpcd)			
	Dry		Rainy	
	lpcd	(n)	lpcd	(n)
Urban households with RWH systems	11	120	15	118
Urban households with protected wells	17	21	22	19
Rural households with protected wells	24	38	52	21
Urban schools with RWH systems	0.8	2	1.6	4
Urban schools with other systems	3	2	1	2
Rural schools with RWH systems	1.1	8	1	9

i. Urban households with RWH systems

The evaluation team determined the quantity of water used in urban households with RWH systems through self-reported responses to survey questions and observations of RWH tanks. Of 147 households selected for the urban area sample, 142 households, or 97%, actually had tanks; all were 10,000-liter galvanized iron.

Several households surveyed in the suburban areas were home to multiple families, which increased the average household size in the sample. Thus, urban RWH households ranged in size from two to 28 people, with an average reported household size of 10 people, and over 75% reporting between five and 20 people. When asked to rank the supply of the RWH system from very poor to excellent, most of the urban households (95%) reported “good,” “very good,” or “excellent” supply. (See Figure 3.)

Figure 3. Reported Water Supply Ranking from RWH Systems: Urban Households



In the rainy season, the estimated quantities of water obtained from the RWH tank per person ranged from 0 to 89 liters per day, with an average of 15 liters per day. People reported using more water from USAID-funded RWH tanks in the rainy season (15 lpcd) than the dry season (11 liters lpcd). The distribution for rainy and dry seasons is shown in Figure 4 and Figure 5 below.

Figure 4. Water Quantity Reported by RWH Households: Rainy Season

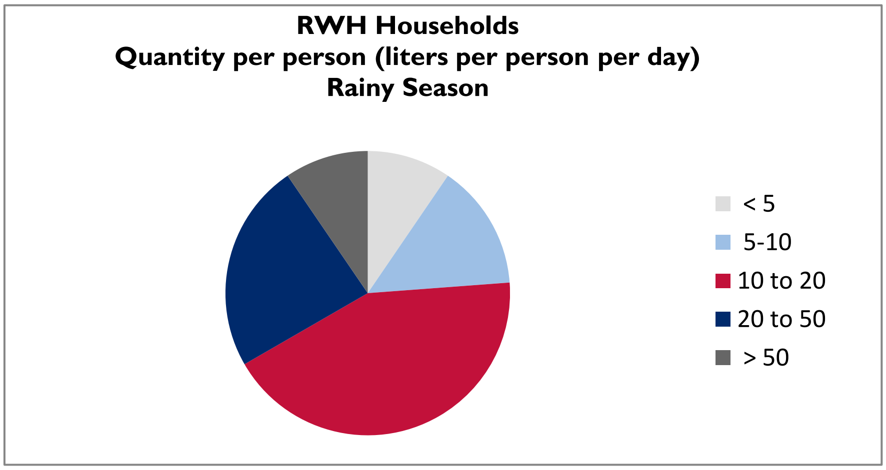
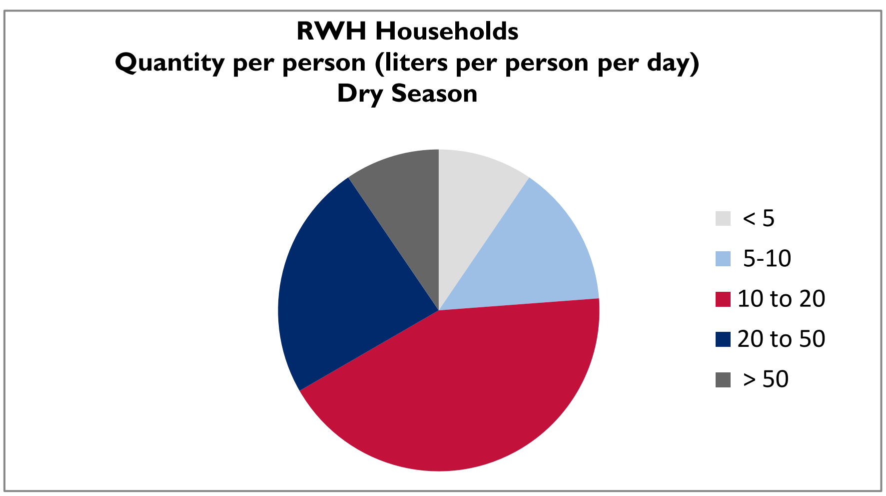


Figure 5. Water Quantity Reported by RWH Households: Dry Season



The evaluation team observed more tanks with water in the rainy season (75%) than the dry season (44%), despite below-average rainfall in regions visited. More people connected their municipal water tap to the RWH tank in the dry season (13%) than in the rainy season (9%). See Table 9.

Table 9. Quantity and Access in Urban RWH Households

Urban RWH Households	Dry	Rainy
Average reported quantity (liters per household per day)	62	88
Average estimated quantity (liters per person per day)	11	15
% of tanks with water during visit	44%	75%
% of RWH tanks with municipal water attached	13%	9%
Number of households sharing water	33	50

ii. Urban RWH schools

The evaluation team visited two urban schools with multiple RWH tanks. The team estimated the per-person quantity by dividing the reported quantity used by the total number of reported students. The calculation excludes the number of teachers at each school, likely making the reported figures an overestimate of the actual available quantity (see Table 10).

Table 10. Quantity and Access in Urban RWH Schools

Urban RWH Schools	Dry	Rainy
Average reported quantity (liters per school per day)	1250	1960
Average estimated quantity (liters per student per day)	0.8	1.6
% of tanks with water during visit	69%	69%
% of RWH tanks with other source attached	0%	0%

iii. Rural RWH schools

The evaluation team visited eight rural schools (with an average size of 535 students) in Mutasa and Mutare and observed a total of 17 RWH tanks. IRC and Mercy Corps had installed 5,000-liter PVC tanks at schools in these districts. All of the schools visited use boreholes as another source of water. One school had connected the borehole to the RWH tank to store water year-round. (See Table 11).

Table 11. Quantity and Access in Rural RWH Schools

Rural RWH Schools	Dry	Rainy
Average reported quantity (liters per school per day)	591	440
Average estimated quantity (liters per student per day)	1.1	1.0
% of tanks with water during visit	59%	56%
% of RWH tanks with borehole attached	14%	14%

Respondents from schools with one tank responded that they did not have enough water from the tanks; respondents generally wished to have larger and/or more tanks. While the NGOs probably intended the RWH tanks to provide or supplement drinking water supplies, it appears that at schools, the RWH water is mostly used for handwashing and borehole water, if available, is used for drinking.

iv. Urban schools—other systems

The evaluation team visited 10 urban schools and the Tariro Organization (a residential facility for patients with mental disabilities), all of which had had USAID-funded water interventions; these interventions included reservoir tanks connected to boreholes or a municipal tap and boreholes. Because seven of the respondents did not estimate the amount of water collected from the water source, the evaluation team could not calculate estimated quantities per person for those schools/facilities. Since the Tariro Organization also sells water to the community and the evaluation team did not obtain estimates on the number of people who buy water and in what quantities, it was not possible to calculate a realistic estimate of quantity per person for that water point. Thus the averages in Table 12 are based on data from three schools.

Table 12. Quantity and Access in Urban Schools: Other Water Systems

Urban Schools—Boreholes and Reservoir Tanks	Dry	Rainy
Average reported quantity (liters per school per day)	4100	900
Average estimated quantity (liters per student per day)	3	1

v. School sentiment regarding quantity

No school representative ranked water supply from the USAID-funded systems as poor or very poor. Of school representatives, 83% and 17% reported water supply as “very good” and “good,” respectively, in the rainy season; 56% and 11% reported water supply as “very good” and “excellent,” respectively, in the dry season. Rural school rankings were similar in rainy and dry seasons.

vi. Urban protected well households

The evaluation team visited 22 households in Epworth. The average size of surveyed households was 19, with a very broad range of five to 100 residents. Several homes had lodgers, and residents were asked to include them in the count, which accounts for the large range in residents. One large household, with 100 reported residents, consisted of several multi-family homes. Protected and unprotected wells are the main source of water for most households in Epworth; only five of the surveyed households, or 23%, reported having municipal taps. The quantities of water reported for households with protected wells are reported in Table 13.

Table 13. Quantity and Access from Protected Wells: Urban Households

Epworth Households	Dry	Rainy
Average reported quantity (liters per household per day)	295	336
Average estimated quantity (liters per person per day)	17	22
% of households that reported sharing	59%	9%

Figures 6 and 7 indicate that, for both the rainy and dry seasons, 43% of households with protected wells had between 10 and 20 lpcd of water. The distribution of households within each range of water quantity is very similar for both the rainy and dry seasons.

Figure 6. Reported Quantity of Water Collected from Urban Protected Wells: Rainy Season

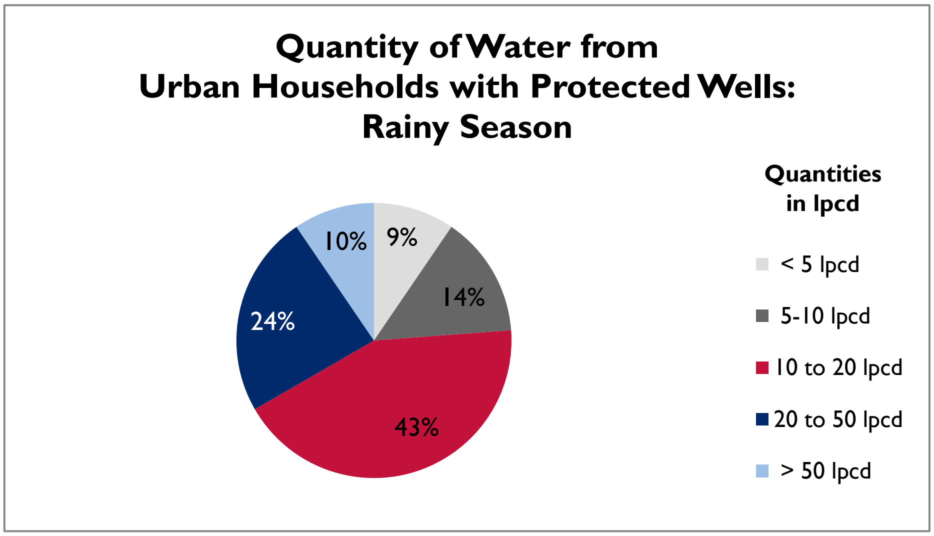
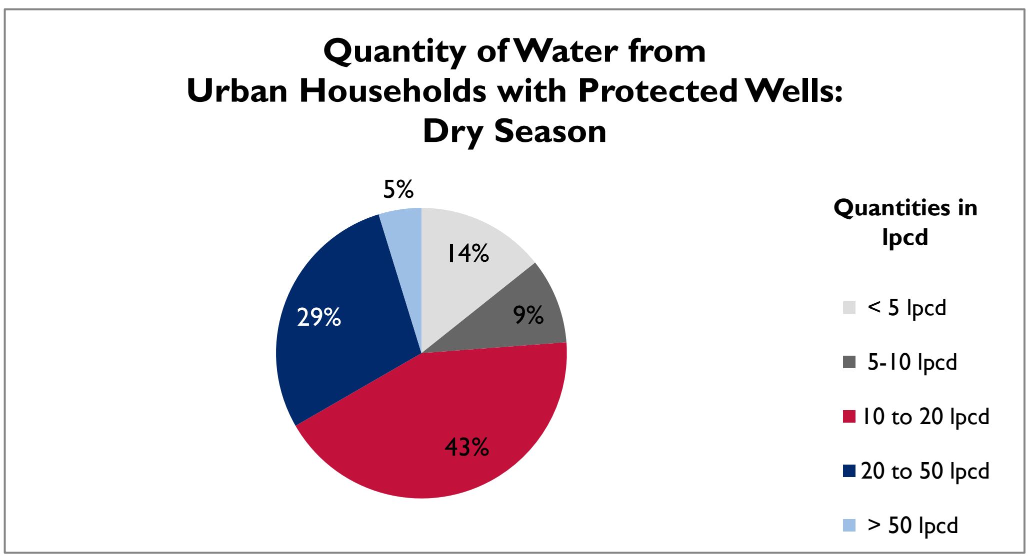


Figure 7. Reported Quantity of Water Collected from Urban Protected Wells: Dry Season



When representatives from urban households were asked to rank the water supply from their protected wells, the majority (71%) reported "good," "very good," or "excellent," while 29% reported that supply was "poor."

vii. Rural protected wells

The evaluation team visited 27 rural households (18 in Mutare and nine in Mutasa) with protected wells during the rainy season, and 38 (14 in Mutare and 24 in Mutasa) during the dry season. In the rainy season, the team experienced more difficulty accessing all of the households due to poor road conditions. At each household, the team surveyed residents, observed infrastructure, and collected water quality samples. (See Table 14.)

Table 14. Quantity and Access from Protected Wells: Rural Households

Mutare and Mutasa Households	Dry	Rainy
Average reported quantity (liters per household per day)	147	197
Average estimated quantity (liters per person per day)	24	52
% of households that reported sharing	45%	Not asked

b. Quality

Some NGO partners, including ADRA and Oxfam, conducted water quality testing during the project lifecycle. However, none of the NGOs tested water quality after the project's end: no funds were allocated for such testing because it was not considered part of the project. Water quality testing usually is the purview of the DWSSCs and PWSSCs, as a mandate of the Ministry of Health and Child Welfare and according to ADRA (ADRA, 2012). However, only at two households did the team hear that the PWSSCs have actually undertaken water quality sampling; the results were not made public.

ADRA conducted five water quality tests on RWH tanks; the results show that in general, water from RWH tanks was safe (ADRA, 2012).

At the end of the Zimbabwe Rooftop Rainwater Harvesting (ZIMROOF) program[10] (February 2013), 36 samples were taken from RWH tanks at schools. None tested positive for fecal coliform, and the majority (61.1%) had no coliform present. The remaining samples showed that 16.7% had one to two coliform, 19.44% had three to five coliform, and 2.78% had six to eight coliform per 100 ml. Ideally, the tanks would all have had zero coliform per 100ml. However, the samples were taken during the peak of the rainy season, when coliform counts are typically higher (IRD, 2013).

SI collected 115 samples from USAID-funded interventions in both the rainy and dry seasons. The results were compared to a standards table provided by CIMAS and based on WHO standards (see Table 15).

Table 15. CIMAS Water Quality Standards

	Presumptive Coliform Count (per 100 ml)	Probable No. of Fecal Coliform (per 100 ml)
Excellent	0	0
Satisfactory	1–3	0
Suspicious	4–10	0
Unsatisfactory	>10	≥1

[10] Described in Annex VI.

In 2011, Oxfam conducted water quality tests including fecal coliform on 26 out of 50 protected wells, post-rehabilitation (see Annex IX for results). Only three had detectable fecal coliform (ranging from one to three coliforms per 100 ml).

Table 16 shows that the majority of water quality samples (70%) from rainwater harvesting tanks were of excellent quality. The majority of water quality samples (79%) from protected wells were of unsatisfactory quality in the dry season. The majority of water quality samples from both protected wells and RWH systems were unsatisfactory in the rainy season.

In urban areas, 47% of water quality samples were of excellent quality, and 38% of water quality samples were of unsatisfactory quality. In rural areas, 91% of water quality samples were of unsatisfactory quality.

Table 16. Overall Water Quality Results

Location	Season	Source	Urban/ Rural	No. of Samples	*Excellent	*Satisfactory	*Suspicious	*Unsatisfactory	Not Analyzed
Epworth	Dry	Protected well	Urban	8	2	3	0	3	0
	Rainy	Protected well	Urban	15	0	0	0	14	1
Mabvuku	Dry	RWH	Urban	17	17	0	0	0	0
	Rainy	RWH	Urban	10	4	0	1	4	1
Tafara	Dry	RWH	Urban	5	4	0	0	0	1
	Rainy	RWH	Urban	3	0	2	0	1	0
TOTAL			**Urban**	**58**	**27**	**5**	**1**	**22**	**3**
PERCENTAGE			**Urban**	**100%**	**47%**	**9%**	**2%**	**38%**	**5%**
Mutare	Dry	Protected well	Rural	14	0	1	0	11	2
	Rainy	Protected well	Rural	13	0	0	0	13	0
	Rainy	RWH	Rural	2	0	0	0	2	0
Mutasa	Dry	RWH	Rural	2	1	0	0	1	0
	Rainy	RWH	Rural	5	0	0	0	5	0
	Dry	Protected well	Rural	11	0	0	1	10	0
	Rainy	Protected well	Rural	10	0	0	0	10	0
TOTAL			**Rural**	**57**	**1**	**1**	**1**	**52**	**2**
PERCENTAGE			**Rural**	**100%**	**2%**	**2%**	**2%**	**91%**	**4%**
TOTAL (BOTH SEASONS)				**115**	**28**	**6**	**2**	**74**	**5**
PERCENTAGE (BOTH SEASONS)				**100%**	**24%**	**5%**	**2%**	**64%**	**4%**

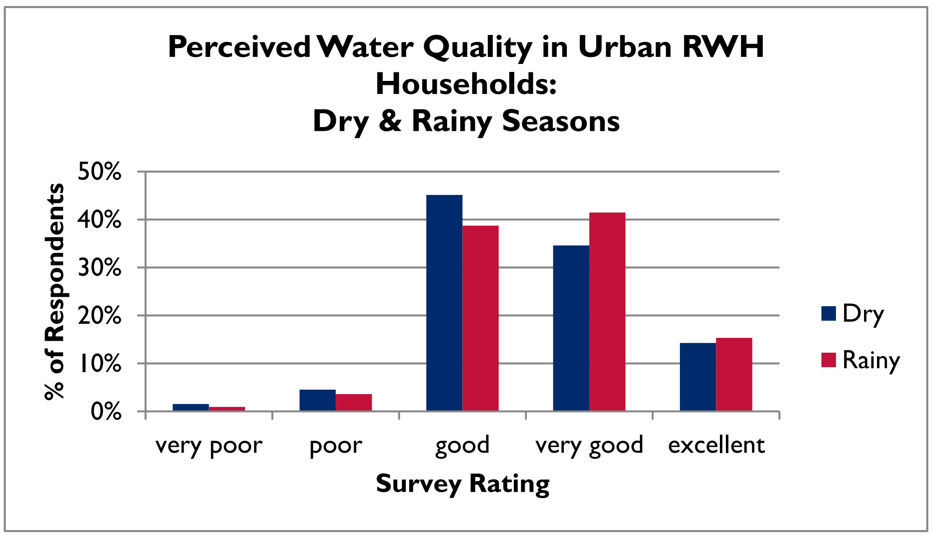
Perceived Quality

Actual water quality results, such as those presented in Table6, sometimes differ from the water quality that people perceive. The evaluation team asked all household and school survey respondents to rank the quality of water. At houses and schools with RWH, the team also asked specific questions about color, odor, and taste. Some households (five urban RWH) and schools (two urban RWH) did not answer the taste question because they do not use the water for drinking.

i. Urban RWH households

More households reported very good quality in the rainy season than in the dry season. In both the rainy and dry seasons, very few households (less than 7%) reported poor or very poor quality. Figure 8, which summarizes survey responses, ranks quality on a slightly different scale—"very poor" to "excellent"—than in the CIMAS results.

Figure 8. Perceived Water Quality in Urban RWH Households: Dry and Rainy Seasons



A high percentage of respondents from urban households with RWH systems reported that water was of good quality: 97% said it was odorless, 95% said it was colorless, and 98% said it had a good taste. These numbers decreased only slightly in the dry season, to 96%, 94%, and 93%, respectively.

The evaluation team visited two urban schools with RWH tanks. At both schools, the respondents reported that the water was odorless, colorless, and tasted good in the rainy and dry seasons.

ii. Urban protected wells

The evaluation team visited 22 households with protected wells in the dry season. All of them ranked water quality as "good," "very good," or "excellent." The evaluation team visited the same 22 households in the rainy season. Again, every household (except for one no response), ranked the water quality as "good," "very good," or "excellent."

iii. Rural protected wells

The evaluation team visited 38 rural households with protected wells in the dry season. Only two households (5%) ranked the water quality as "poor" or "very poor." The evaluation team visited 22 households with protected wells during the rainy season (due to constraints previously described) and all, except for one no response, ranked the water quality as "good," "very good," or "excellent."

c. Water Treatment

The World Health Organization (WHO) specifies that the appearance, taste, and odor of drinking water should be acceptable to the consumer. Water that is aesthetically unacceptable can lead to the use of water from sources that are aesthetically more acceptable but potentially less safe (WHO, 2011). In urban areas, boreholes are thought to provide the best drinking water and [shallow, hand-dug] wells are not thought to provide good drinking water, regardless of whether they are lined or protected (GOAL, 2013).

Water treatment at the point of use, if performed regularly and effectively, can improve water quality.

Water treatment at the household level in Harare and Mutare is compromised by low incomes and power outages (Mercy Corps, 2012). Oxfam's baseline study in Bulawayo, Chitungwiza, Kadoma, Mbare, and Mutare showed that 67.7% of the households did not treat their drinking water. The reason most reported for not treating drinking water was the perception that the water was clean (Oxfam, 2009). This is one of many reported reasons for not treating water, including lack of resources and knowledge, health concerns, taste and acceptability, trust in authorities, time constraints, and more (Oxfam, 2009).

Oxfam speculated that lack of water treatment stemmed from the trust that the respondents had in municipal authorities to adequately treat the water, or that they used and trusted borehole water (Oxfam, 2009). ADRA encouraged other options such as boiling for groups like the Apostolic Church members since they did not accept the use of WaterGuard or other chemical treatment of water (ADRA, 2012).

Therefore, some of the USAID-funded programs included promotion of water treatment. Some of the NGOs distributed soap and Aquatabs as part of their interventions. In Masvingo and Gweru, UNICEF water treatment chemical support ended in September 2011, making it difficult for the council to supply treated water (Mercy Corps, 2012). The following list provides a summary of the water treatment elements of USAID-funded interventions:

- During the ZIMROOF implementation period, IRD signed a Memorandum of Understanding (MOU) with Population Services International (PSI) for the promotion of the water treatment product, WaterGuard, a relatively new, locally produced product in Zimbabwe, in rural areas including Mutare (IRD, 2013).
- Medair instructed schools and clinics in the districts of Bulilima and Mangwe, Matabeleland South, to treat water with WaterGuard and put it in a place where students and patients can access it (Medair, 2013). Schools, clinics, and households were given samples of WaterGuard.
- IMC's hygiene promotion encouraged people in Bindura, Shamva, Rushinga, Mt. Darwin, and Mbire, Mashonaland, to treat (using Aquatabs and WaterGuard) and safely store water. The end-of-program survey found that point-of-use water treatment was being administered by 88% of the target participants. However, on average, correct water use was observed in 79% of cases (IMC, 2011). IMC provided Aquatabs and soap for handwashing at key points during the cholera outbreak and post-outbreak over three months to break the cycle. It also supported the creation of health clubs, which bought WaterGuard and sold it through community representatives. PSI provided continuity once IMC left the District.
- Concern's hygiene promotion included safe water treatment and donated goods from the United Nations Children's Fund (UNICEF). It distributed hygiene kits that included water treatment tablets to 73,360 households in Chegutu, Gokwe North, Gokwe South, and

Nyanga (Concern Worldwide, 2009). However, it found that many households in these areas had little or no ability to purchase replacement consumable items such as soap and water treatment tablets. Also, as the outbreak was subsiding in many areas, people commented that as the cholera was over, they felt they no longer needed to continue safe hygiene practices (Concern Worldwide, 2009).

- ADRA trained 261 trainers in social marketing of point-of-use water treatment chemicals and distributed WaterGuard to 4320 households (ADRA, 2012).
- GOAL provided a three-month supply of soap and Aquatabs and a five-month supply in high-risk areas (GOAL, 2013)
- Oxfam—Hand-dug protected wells were chlorinated after rehabilitation and beneficiaries were provided training on treating well water every month using Aquatabs or WaterGuard (Oxfam, 2013).

i. Urban RWH Households

The evaluation team asked a subset of urban households with RWH (11 out of 142, or eight %) whether they treated water. Figure 9 below summarizes the results. A majority (58%) of the households responded "yes" or "sometimes" in the rainy season. More people responded "yes" in the dry season to treating water. When asked "What can be done to improve water supply from the System," 23 respondents asked for treatment chemicals during the dry season visits; 25 asked for treatment chemicals in the rainy season.

Figure 9. Water Treatment Responses: Urban RWH Households

Are you treating water?		
Household Response	**Dry**	**Rainy**
Yes	52%	26%
Sometimes	0%	32%
No	48%	42%
Requested treatment chemicals	23	25

4. What are the most significant results these water supply projects have delivered to both direct and indirect beneficiaries since FY2009?

The most significant results provided by the water supply projects are related to quantity, quality, and cholera reduction[11]. Findings on quantity and quality are presented in Question 3 above. Findings on cholera are described in Question 5 below.

[11] These results are only tentative and partial, since disease prevalence is typically determined by multiple factors, and the quality and accessibility of water is only one of these. USAID/OFDA requested that the evaluation team address these questions early on in the evaluation.

Findings related to additional results delivered—health, benefits, and uses—are described below.

a. Health

Water pumped into homes by the Harare City Council (HCC) is not currently considered fit for drinking purposes and could soon cause another outbreak of water-borne diseases, according to an independent test commissioned by *The Standard* in October 2013 (Mbanje, 2013).

Diarrheal cases have been increasing in recent years. The Ministry of Health and Child Care receives between 8,000 and 15,000 diarrhea cases per week. At least 440 children under the age of five died of diarrheal diseases in 2013, according to the Minister of Health and Child Care. "While most cases are emanating from the rural provinces, the cities and towns have also contributed significant cases with Harare, Chitungwiza and Kadoma, reporting outbreaks of typhoid and dysentery in early 2013," the Minister said (Mbiba, 2013). Table 17 provides a comparison of reported cases of diarrhea by intervention type. In both seasons, households with RWH reported more cases of diarrhea within the last week than households with protected wells.[12]

Table 17. Comparison of Reported Diarrhea Cases by Intervention

	Household Member Had Diarrhea in Last Week	
Location and Intervention Type	Dry Season	Rainy Season
Urban households with RWH Systems	15%	20%
Urban households with protected wells	9%	9%
Rural households with protected wells	8%	25%

b. Reported Benefits and Uses

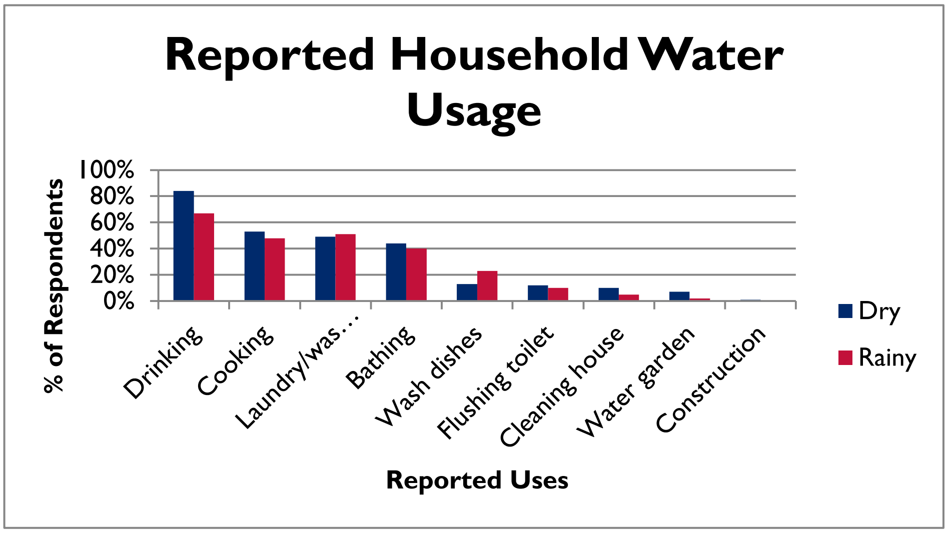
Self-reported household benefits include a water source closer to home, the ability to share water with their neighbors, and the unintended benefit of being able to store intermittent water from municipal taps with the RWH systems.

Several urban households mentioned drawbacks to the RWH system: it prevented them from extending their home to accommodate more lodgers (and thus more income) and the tank takes up space meant for a garden.

Reported uses for water retrieved from RWH systems are compared for rainy and dry season in Figure 10. Drinking, cooking, laundry, and bathing (in that order) are the most common uses for RWH water in rainy and dry seasons.

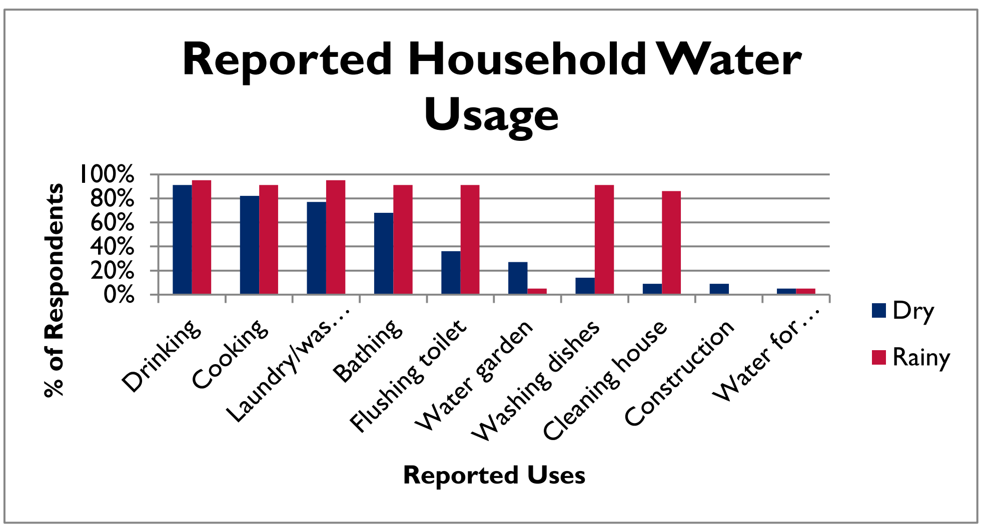
Figure 10. Reported Household Water Usage for RWH: Urban

[12] Please see the footnote above.



Reported uses for water retrieved from protected wells are compared for rainy and dry seasons in Figure 11. Drinking, cooking, laundry, and bathing (in that order) are the most common uses for water from protected wells in rainy and dry seasons. However, in the rainy season, more people reported using water for flushing toilets, washing dishes, and cleaning house.

Figure 11. Reported Household Water Usage for Protected Wells: Urban



Figures 12 and 13 compare the reported uses for water retrieved from RWH systems to reported uses from protected wells for the dry season and the rainy season, respectively. This indicates that a higher percentage of households are using water for purposes other than drinking in both rainy and dry seasons.

Figure 12. Reported Urban Household Water Usage for Dry Season: RWH vs. Protected Well

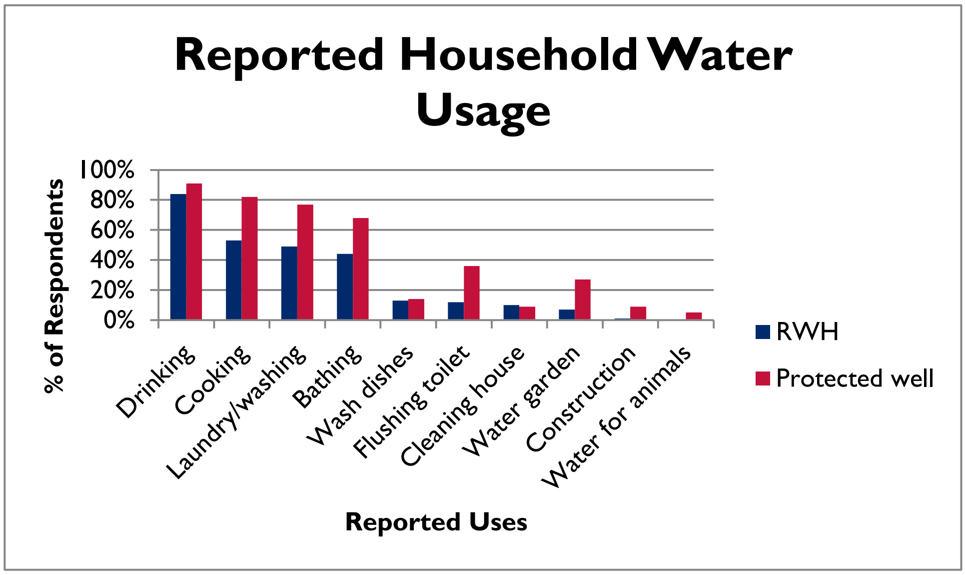


Figure 13. Reported Urban Household Water Usage for Rainy Season: RWH vs. Protected Well

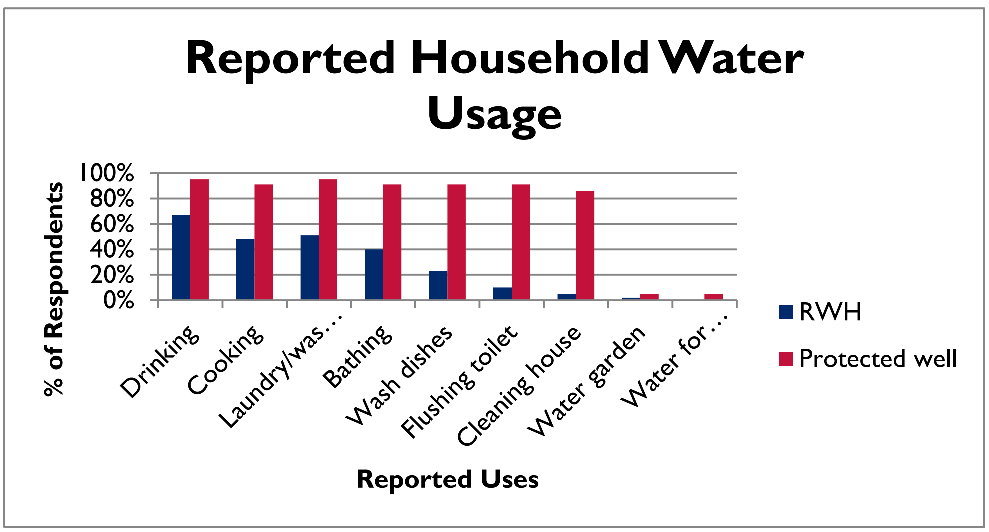
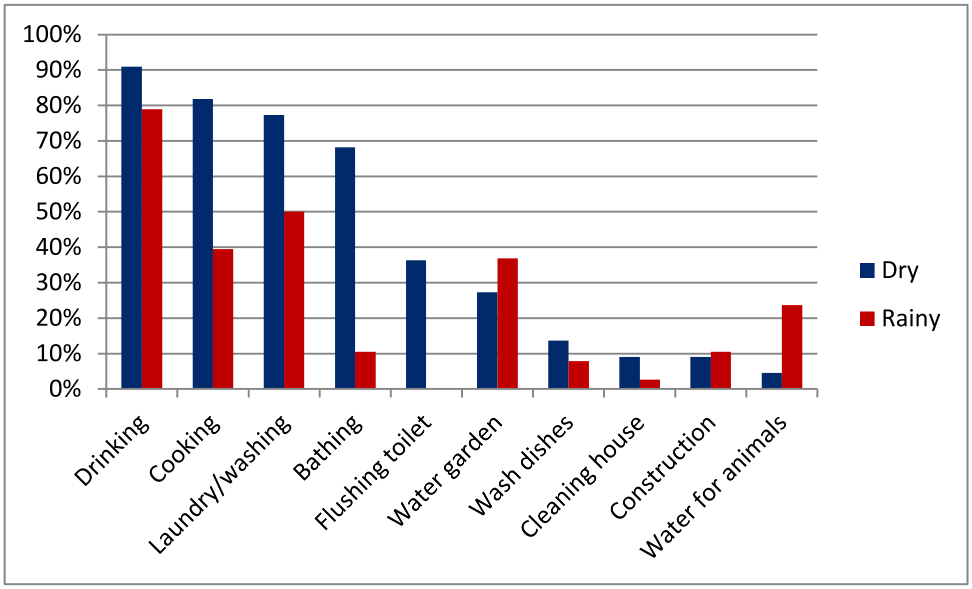


Figure 14 compares the reported uses for water retrieved from protected wells for dry and rainy seasons. This indicates that households rely on the well for more basic uses—drinking, cooking, laundry, bathing, and flushing the toilet—in the dry season than in the rainy season. More water is used for watering animals and construction in the rainy season.

Figure 14. Reported Rural Household Water Usage for Protected Wells: Dry and Rainy Seasons



Urban and rural schools with RWH systems report using water for multiple uses including drinking (50% of respondents), cleaning the school building (50%), handwashing (50%), cleaning or flushing the toilets (50%), watering gardens (50%), cooking (10%), and teachers taking home (10%).

5. Is there evidence that the water supply projects were associated with cholera prevention or mitigation?

From August 2008 to July 2009, Zimbabwe's poorly maintained water and sanitation infrastructure and fragile health system led to 98,600 cases of cholera, resulting in nearly 4,300 deaths (Office of Inspector General, 2012). In 2008–2009 the capital, Harare, was the epicenter of the epidemic; in the working-class suburb of Budiriro, 30 strains of cholera were detected and all water sources in the area were contaminated, but in the last few months WHO had reported only six cases in the capital and no deaths (IRIN News, 2010).

According to the OIG audit, rainwater harvesting tanks would likely not mitigate a large cholera outbreak because they collect water only during the rainy season. Water collected by a tank may then be consumed in a matter of days or weeks, depending on the size of the tank and the number of users, while wells provide water throughout the year. However, the cholera outbreak of 2008–2009 (one of the worst in a century) started in August, one of the driest months of the year, when the rainwater harvesting tanks would likely have been empty or at low levels (Office of Inspector General, 2012).

Most of the RWH households (78%) that the evaluation team surveyed in the rainy season in urban areas said they also used municipal water; 23% of the households with protected wells also reported using municipal water. In urban areas, 44% of the households with RWH tanks also reported using boreholes; none of the Epworth households reported using borehole water.

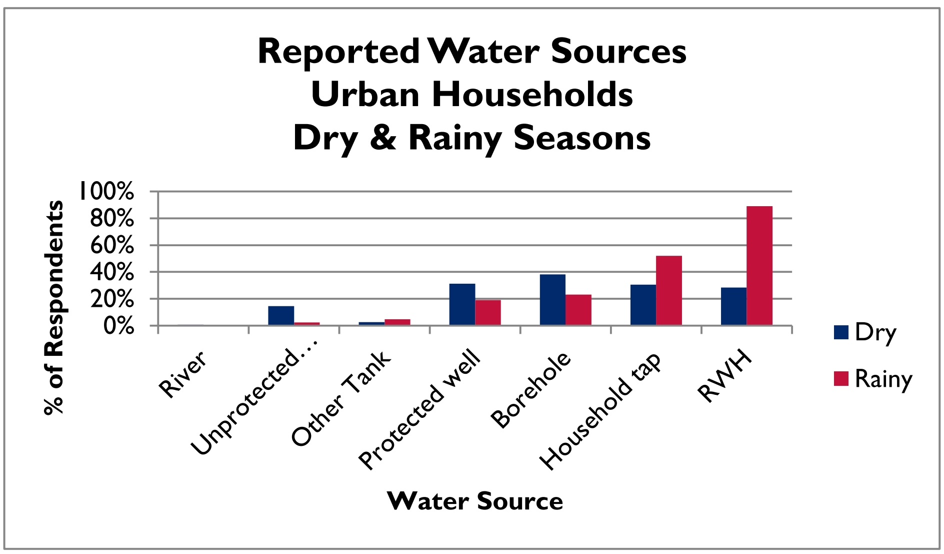
During surveys, the evaluation team asked all households, "Did any household member suffer from cholera since 2009?" (See Table 18.)

Table 18. Comparison of Cholera Rates by Intervention

Location	Household Member Had Cholera Since 2009	
	Dry Season	Rainy Season
Urban households with RWH systems	3%	8%
Urban households with protected wells	0%	0%
Rural households with protected wells	3%	0%

Many households in Harare suburbs have municipal taps but rely on multiple water sources because municipal water services are unreliable (reportedly coming only twice per week). Some households have an unprotected source that is just as convenient as the improved water intervention. Most households report using multiple sources in addition to the RWH system, including household tap (municipal water supply), borehole, protected wells, unprotected wells, and other sources (see Figure 15).

Figure 15. Reported Household Water Sources for RWH Households: Dry and Rainy Seasons



Handwashing

While not specifically mentioned in the evaluation questions, handwashing with soap is an important part of cholera prevention. Because of the limited time available for surveys, SI used proxy indicators—the reported and/or observed presence of soap—for handwashing. The evaluation team asked, “Do you have soap available for handwashing?” and a follow-up question, “If yes, can we see the soap?” Thus, these numbers do not necessarily indicate handwashing behavior by any or all members of the household, even if soap was observed. The soap observed most often was “green bar”—a multipurpose soap that is often used for laundry. In some cases the respondents reported that the soap was locked up, and because of limited time to do each survey, were not asked to bring it out.

A greater percentage of urban households reported having soap for handwashing than rural households. However, a greater percentage of rural schools reported having soap than urban schools (see Table 19.)

Table 19. Handwashing Reported and Soap Observed

Location (number of respondents)	Handwashing Reported	Soap Observed
Urban households with RWH systems (143)	68%	58%
Urban households with protected wells (21)	86%	28%
Rural households with protected wells (36)	58%	53%
Urban schools with RWH systems (2)	100%	100%
Urban schools with other systems (7)	57%	50%
Rural schools with RWH systems (8)	75%	50%

6. Is there evidence that the water supply projects were associated with drought mitigation?

There is no direct evidence that USAID/OFDA–funded water supply interventions were associated with drought mitigation. As described in the findings for the efficiency section, not all of the RWH tanks in Zimbabwe are providing a reliable source of water to households year-round.

The evaluation also considered whether water was available for more purposes than drinking as a proxy for drought mitigation. For example, findings on the different ways that households use water (described in Question 5) show that more households use less protected well water for gardening in the dry season (drought situation) than in the rainy season. Also, those rural households use less protected well water in the dry season as water for animals than in the rainy season (5% versus 24%).

The evaluation team also looked for the presence of gardens that might be watered using the water intervention as another proxy indicator of drought mitigation. In urban areas, 17 RWH households (12%) had evidence of agricultural activities in the form of small gardens within the compound.

7. What evidence is available that demonstrates the RWH activities have been replicated or may be replicated in the future?

IRD Zimbabwe's willingness-to-pay study concluded that 5% to 15% of Chitungwiza's 300,000 homeowners are willing to pay more than US$1,000 for a standard rooftop RWH system, while up to 25% of the homeowners are willing to pay US$500. This indicates the potential demand for 6,000 to 18,000 Rainwater Harvesting Units equating to $6–8 million in revenue for local businesses and local industry (IRD, 2013). However, this evaluation found that only 58% of respondents make more than US$100 per month. While these respondents make more than US$100 per month, this income level is still well below the poverty line for Zimbabwe, as shown in Table 20 below.

The poverty datum line is an official figure published by ZimSTAT (formerly Central Statistics Office); the average estimate is the average from independent studies in the country. These data suggest that most people in Zimbabwe, about 60%, live on less than a dollar per day. The respondents in this evaluation suggest an even lower household income of US$100 per month (or US$0.56 per person per day) as maximum. The table below therefore indicates that the average household cannot afford to pay for its own RWH system.

Table 20. Reported Household Income Compared to Poverty Datum Line

Household Income Estimates	USD/Month	USD/Year
Poverty datum line (PDL)	550	6,600
Average estimate (various)	200	2,400
58% of respondents for this evaluation[13]	100	1,200

There was no evidence of RWH replication or ability to replicate during surveys in urban areas. There are some examples of homemade, low-tech RWH systems in rural areas but they were built before the USAID-funded RWH interventions.

To get a sense of how interested the general population was in RWH systems, the evaluation team asked urban and rural households with protected wells whether they were familiar with RWH systems. The team observed no RWH systems in Epworth. The evaluation team asked the 12 urban household respondents who were familiar with RWH tanks whether they were willing to construct their own RWH system; 11 said yes. The team then asked two follow-up questions, "Do you know how much it costs to build a RWH system?" and "Where would you get materials to build RWH?" None of households knew the costs or where to get the materials. One person asked whether the NGO would contribute.

The evaluation team asked 24 rural households with protected wells, "Are you willing to construct your own household RWH system?" and 16 (67%) said yes. One household had built one already. The team asked two follow-up questions, "Do you know how much it costs to build a RWH system?" and "Where would you get materials to build RWH?" Seven respondents gave estimated costs, ranging from US$200 to $1,000, or an average of US$557. Several households said materials would be locally available. Reasons for not constructing a RWH system generally fell into two categories: "The well is sufficient" and "There are not enough resources." The 24 rural households were selected from the sample frame and using the methodology described previously.

Mercy Corps found replication of the health clubs that were established under the project. For example, in Guruve, out of one health club 34 others blossomed, as neighbors trained their neighbors (with shadowing but not active training by IMC) (IMC key informant, 2013). The program was designed to be self-sustaining. Community members trained on how to form hygiene clubs were tasked to start a club in their community and train neighboring community health workers to form their own clubs. Among other topics covered through health club sessions was the construction of low-cost latrines to reduce open defecation in the respective communities. IMC distributed WaterGuard to health clubs for them to sell to community members at a small profit. With the profit realized, clubs would procure more WaterGuard units on their own to repeat the distribution cycle and expand the distribution geographically (IMC, 2013).

[13] The remainder report less income per month.

Area II. Efficiency

8. Are the RWHs in Zimbabwe efficient in providing a reliable water source to households year-round? How does this compare to wells in the same communities?

The RWHs in Zimbabwe are not all providing a reliable source of water to households year-round. In the dry season, 79 out of 142 (56%) RWH tanks in urban areas had no water. However, they do provide a way to store the intermittent water that comes from the municipal taps. At least 18 households (13%) had connected their municipal water tap to the RWH tank. In the rainy season, it had not rained as much as expected in the weeks preceding the surveys. As a result, none of the RWH tanks that the team visited were full.

For comparison, not all the protected wells are providing water reliably year-round, either. In Epworth, some unprotected wells had water while the protected wells across the street did not. During the evaluation team's rainy season visits, there was very little rain in Epworth. Out of 22 protected wells, six were dry and one was almost dry. No other water sources are available there. At one well, the team counted 50-plus buckets waiting to collect water.

9. Are the RWHs in Zimbabwe cost-effective for households and institutions? Please stratify findings by households, schools, and clinics. How does this compare to wells in the same area?

The RWHs are not cost-effective for households but might be for institutions such as schools. A key informant noted there are problems with getting people to pay for WASH provisions. This is compounded by the fact that in most areas boreholes provide "free" water in parallel with piped water systems, albeit very sporadically (Concern, 2013). RWH systems are often not favored due to a combination of low return on investment and perceived health risks (Oxfam, 2013).

The cost varied widely depending on the type of tank, the NGO that installed it, and the location of the intervention. Table 21 compares the costs by implementer and tank type. Costs for RWH systems range from US$1,000 to $13,400.

Table 21. Cost of Building RWH Systems, by NGO

NGO	Cost of Building RWH per Household (USD)	Tank Size (m^3)	Tank Type	Unit Cost (USD/m^3)	Average NGO Rate (USD/m^3)
IRC	3,700	5	PVC	740	740
Mercy Corps	1,350	18	Brick/cement	75	310
	1,000	5	PVC	200	
	6,000	10	Galvanized iron	600	
	11,000	30	Galvanized iron	367	
ADRA	1,300	10	Ferrocement	130	339
	2,200	5	Galvanized iron	440	
	13,400	30	Galvanized iron	447	
OXFAM	6,000	30	Galvanized iron	200	200

IRD	1,620	10	Galvanized iron	162	199
	8,800	30	Galvanized iron	293	
	1,250	10	Ferrocement	125	
	4,350	20	Ferrocement	218	

A more recent best practices document prepared by IRD after the interventions evaluated here presents these costs per beneficiary (see Table 22) (IRD, 2013).

Table 22. Cost per Beneficiary Comparison of RWH Designs Constructed by IRD

Tank Design	Location	Cost per Beneficiary (USD)	Notes
Galvanized steel	Household (peri-urban)	$90	18 users per household
Galvanized steel	School (peri-urban)	$44	200 students per tank
Ferrocement	Household (rural)	$78	16 users per household
Ferrocement	School (rural)	$29	150 students per tank

For comparison, a hand-dug protected well costs on average about US$400 to rehabilitate (depending on the depth). This intervention is thought to have more potential for replication given its lower cost (Oxfam, 2013).

IRD used ferrocement (reinforced concrete) tanks in schools and households in rural areas as these were not less expensive but required material and workforce available at the community level. Under the Mercy Corps–led JI program, targeted households were given the option to cluster together and opt for a larger tank and share a single water harvesting system. Households would then be able to share water with others in the community at their own discretion and following their own agreed-upon procedures.

IRD's willingness-to-pay study showed that there was a demand for an RWH system priced at US$1,100 (for a 10,000-liter tank), with up to 15% of Chitungwiza's 300,000 homeowners willing to pay more than US$1,000 for a standard RWH system and up to 25% willing to pay US$500 (for a 5,000-liter plastic tank) (IRD, 2011). Nevertheless, the study also highlighted the need for financial mechanisms to support the demand and income levels of interested households.

Urban RWH households report paying an average of $24 per month for water bills. The evaluation team found very few cases where individuals paid money to maintain RWHs and/or wells, except that several households do purchase Cobra, an inexpensive polish that they use on the concrete of the protected wells.

To understand households' ability to pay for operations and maintenance, water treatment products, or soap, the evaluation team asked each household their main source of income and their estimated monthly income. These questions were only asked during the first (dry season) field visit because the answers were not likely to change within six months. Urban households reported income from informal employment (30%), rental income (20%), formal employment (19%), remittances (15%), growing and selling vegetables (10%), and pensions (6%). The majority of urban households with RHW systems surveyed earned more than US$100 per month.

10. Were the water supply interventions funded by USAID/OFDA in Zimbabwe well-coordinated with other donors to avoid duplication of effort?

One key informant stated that OFDA was deemed to be the first off the mark after the outbreak in committing and disbursing funds essential for mitigation projects (GOAL, 2013).

Concern International was the coordinator of WASH activities during the cholera outbreak, both in Chegutu (the location of its OFDA-funded intervention) and beyond (Concern, 2013). As a result, there was good coordination during and immediately after the outbreak. The JI Program spearheaded by Mercy Corps facilitates such coordination (among ADRA, GOAL, OXFAM Great Britain, and IRC) in urban areas. There was also coordination outside this mechanism. Under the JI Program, Mercy Corps and its partners were able to leverage the investments USAID/OFDA made in improved RWH approaches in Zimbabwe. Mercy Corps also led the WASH segment of the national European Commission on Humanitarian Aid & Civil Protection (ECHO) project and, as such, was able to coordinate well with other donors under the OFDA-funded interventions to avoid duplication.

IRC worked with IRD Peri-urban ROOFtop Rainwater Harvesting in Zimbabwe I (PROOF I) in the design process of the project. It collaborated with Mercy Corps, sharing information and learning from their experience: a "look and learn" partnership. IRC also worked closely with PSI on use of WaterGuard at the point of use (IRC, 2013). NGO partners generally undertook similar capacity building and training of communities/schools—for example, in proper point-of-use water management and in operation and maintenance of water sources (RWH, boreholes, shallow wells, etc.). According to the literature review, by and large, similar stakeholders were targeted, including School Health Clubs, School Development Committees, environmental health workers, vulnerable group–headed households (orphans/widows/HIV-AIDS afflicted/elderly). For example, ADRA Zimbabwe collaborated with Zimbabwe Applied Health and Development (ZimAHEAD) for production of materials and monitoring and evaluation support (ADRA, 2013). IMC also partnered with ZimAHEAD on the training of community volunteers on hygiene clubs (IMC, 2013).

Area III. Coverage and Design

11. Assess the appropriateness and success of the design of the different USAID/OFDA–funded RWHs implemented in Zimbabwe in varying locations, including urban vs. rural settings of households, schools, and health facilities. The assessment will include, but is not limited to, the size and construction quality of tanks, gutters, piping, taps, and roofs.

According to the IRD best practices guide (IRD, 2013), the application of rainwater harvesting technologies varies widely, according to context-specific factors, including:

- High degree of community involvement
- Locally available skills
- Cost
- Availability of materials
- Suitable climactic conditions
- Market/demand for additional tanks
- Resource mobilization from multiple stakeholders
- Training and demonstrations

While plastic tanks are relatively less expensive, IRD purposefully chose to install galvanized tanks in high-density areas over plastic tanks for a number of reasons:

- In order to attain the requisite 10,000-liter storage volume, two 5,000-liter plastic tanks would be required, which would not only double the cost but would necessitate more (unavailable) space to actually locate the tanks within people's homesteads.
- Plastic tanks are too tall for high-density homes, while galvanized iron tanks could be manufactured to the desired height and footprint.
- Plastic tanks are easily tradable commodities, particularly given the current economic conditions.

The production of galvanized iron tanks created a small industry, albeit short-lived, that in turn provided employment and income for many community members (Key Informant, 2013). Additional details on the reported and observed problems with RWH systems can be found under Question 15. The reported and observed problems with RWH systems include:

- Vandalism and theft, of taps in particular
- Neighbors threatened to poison the tank (e.g. putting a dead cat in the tank) if the RWH household did not share the water)
- Leaking tanks
- Downfall pipe clogged
- Sediment in the bottom of the tank
- No easy way to remove sediment from the tank—if you could remove the tap easily you could get sediment out through the hole
- Hole at the top is so small that only small children can get in. One respondent said he did not want to put his child in the tank because he heard that a child had died in the tank.
- Expectation for IRD to come back to fix or clean
- Many downpipe elbows leaking

There were also some concerns about asbestos in the roof tiles; all of the homes in suburban areas had asbestos tile roofs. One man stopped the team in the street in between surveys and asked us how rooftop rainwater could be safe if it was going across asbestos, which has been banned.

Most of the RWH systems that the evaluation team observed were placed in front of one half of a duplex, but the gutters ran across the full building. While the tank and the water in it are considered the property of the household whose yard the tank is in, the water comes from the whole roof. While the team was conducting surveys, some neighbors complained that once the roof is used for rainwater harvesting, it restricts the use of the roof for the neighbor. For example, the neighbor cannot put laundry on the roof or dry maize on the roof.

The evaluation team asked users what could be done to improve water supply from the system. Some respondents had more than one recommendation, thus the percentages are based on the total number of recommendations rather than the number of households.

Out of 76 total recommendations, the most common request (26% of responses) was for water treatment chemicals to be provided. The second most common (20% of responses) was to provide some sort of maintenance or repair. Eleven households (14% of responses) wanted another source (e.g., municipal tap or tanker truck) to fill the tanks in the dry season. Design changes include adding an extra gutter, increasing the size or number of tanks, and providing more durable taps. To collect water more efficiently, one could add gutters on either side of the same house. This would probably require relocating the RWH tank from the front to the side of the house.

In the rural households with protected wells, the most common improvement suggested was to deepen the well (57% of responses, out of 14 total recommendations). Other suggested improvements included a new chain or rope and/or bucket; adding a storage tank; fencing the area around the well to keep out animals; and adding a pump and/or pipe to get the water from the well to a garden.

12. Assess how replicable the current designs of the RWH systems are in Zimbabwe. The RWH systems were intended as "demonstration" systems that could be made replicable if a low-cost design were perfected and demonstrated. Will households, schools, or health facilities be able to afford to construct similar systems without foreign aid?

As described in the findings for Question 9 above, there was no evidence of replication of the RWH systems. As described in the findings for Question 7 above, households do not know the costs or how to build a RWH system. The evaluation team did, however, observe the presence of some non USAID-funded RWH systems in the rural areas. The data collection schedule did not allow time to determine how these were made (i.e., whether they were made locally or with donor funds).

13. Assess the storage volume constructed for each household, school, and health clinic. Was the storage volume designed appropriately? Would a different storage volume be more replicable and still reduce cholera risks?

The storage volume design would probably be appropriate if households did not have to share water. As presented in Question 3 above, both RWH and protected well households share the water with other households. In high-density suburbs, the RWH tanks are obvious to anyone walking through the neighborhood. Many households do not have a fenced yard with a gate, so unless they lock the tap, they have no way to regulate access to water from the RWH tank. Ten households had locks on their tap. (Using a lock can backfire, however: one household had lost the key and so had no access to its tank). A rough calculation shows that people with locks or limited sharing seemed to have more water,[14] as shown in Table 23.

Table 23. Comparison of Quantity of Water in RWH Tanks for Locked and Unlocked Taps

Tap Locked	Average Estimated Quantity in Tanks (liters)	
	Dry	Rainy
Yes	2235	3418
No	1481	1905

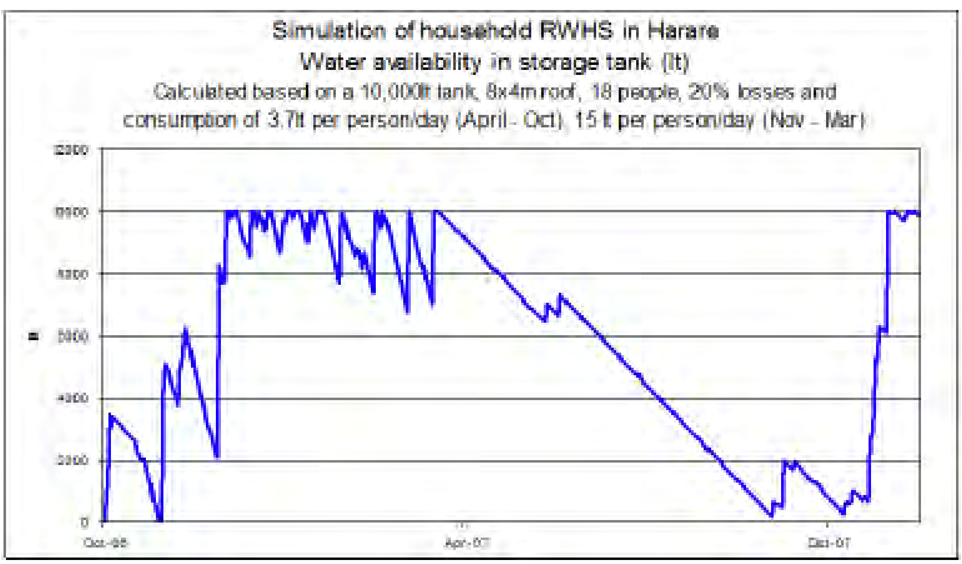
[14] The original survey did not include whether taps were locked; some enumerators, however, took note of this important characteristic and reported whether taps were locked. This, however, was not a required observation and the data is not comprehensive, so there is some inaccuracy in the numbers presented, especially for the dry season.

The question about whether different storage volumes would be more replicable and still reduce cholera risks implied that the original storage volume was replicable. As described in the findings for Question 7, there is no evidence of replication. The question also implies that cholera reduction can be attributed to the interventions. As described in the findings for Question 5, cholera rates are reduced across the country but cannot be directly attributed to the USAID/OFDA–funded interventions.

Storage volume for RWH interventions varied depending on the type of tank, end user (institution vs. household), and the NGO counterpart that installed it. As was noted in interviews with the various NGO representatives, most NGOs that built RWH systems followed the work of IRD.

IRD undertook simulations of the volume of water within different sizes of tanks over time for different levels of water consumption per capita, taking into consideration historical daily precipitation data for the sites in question. In this way, IRD estimated the optimal tank volume for household and school/institution tanks. Assuming a consumption estimate of 270 liters of water per day (15 lpcd) during the rainy season (Nov–Mar) and 67 liters per day (equivalent to 3.7 lpcd) during the dry season (April–Oct), IRD estimated a household tank of 10,000 liters would provide water year-round for the household (in this case, technically made up of three families of six people each, totaling 18 people) if well managed (see Figure 16 for simulation of a "household" in Harare).

Figure 16. Simulation of Assumptions for Household Rooftop RWH in Harare



Source: IRD. (2013). *Rooftop Rainwater Harvesting Best Practices Guide*. USAID.

For schools, several (up to eight) 30,000-liter tanks were installed depending on the number of students enrolled (most schools had over 1,400 students).

A survey conducted three years after PROOF I in the high-density suburbs of Mabvuku and Tafara showed that 90% of households' water from RWH systems did not last all year, partly due to sharing with other households.

14. Was vector control required at the water supply site and, if so, how well did it function?

In urban areas, vector control was part of design for IRD tanks (screens and lids), which were the only types of tanks the evaluation team observed in the urban areas. IRC did not require vector control in their RWH design (IRC, 2013). ADRA included a screen where the downpipe enters the tank to keep out insects (ADRA, 2013).

No mosquitoes or larvae were observed during the dry or rainy seasons. In rural areas, nine out of 17 tanks (53%) had vector control (screens and lids).

Area IV. Sustainability

15. Are the water supply interventions currently operational? If not, why?

The OIG audit noted that OFDA's strategy for disaster risk reduction emphasized RWH tanks rather than wells, because well pumps tend to break if they are not maintained regularly. However, during site visits, auditors found that five of 14 (36%) recently constructed USAID RWH tanks were no longer functional or were not being maintained to allow maximum clean water collection and retention. Two other tanks had not been constructed properly to prevent leaks, although the grantee was confident that the concrete would cure properly. However, all five OFDA-constructed hand-dug wells observed during audit site visits were functional (Office of Inspector General, 2012).

The evaluation team observed the infrastructure during school and household visits, which provided a snapshot of the functionality. To understand the long-term reliability of the water points, survey participants were asked about (1) how many times the water system has broken down since it was constructed and (2) whether there are any problems with water supply from the system.

One key informant estimated that 50% of the rehabilitated boreholes were operational at present, due to greater competition for the water from many uses (household, irrigation, etc.) and concomitant erratic rainfalls in the past five to six years. Another key informant indicated that the high failure rate of boreholes might also have been due to the poor performance of one contractor.

Spare parts are difficult to obtain, especially in rural areas. For example, if a borehole in Mutasa needs a leather cup to be replaced, this $1 item can only be obtained in Mutare, about 60 km away. To acquire it a water committee member—usually the Village Pump Minder (VPM), if there is one—has to first report to the District Development Funds (DDF). Then he is referred to the DDF District Office in Mutasa, who in turn directs him to the provincial stores in Mutare. He will likely be told that the cups are not in stock, so he must either go back and wait another three to six months or go to the head office in Harare 270 km away. If he is persistent, it will take him at least one week and upwards of $20 (for travel) just to get a $1 item. Naturally, most people just give up and wait for "nature to take its course."

a. Urban RWH Households

The evaluation team observed the RWH tanks and found that, in both rainy and dry seasons, 58% were fully functional and had not broken down since installation, 34% were functioning with problems, and 8% were not operational. In the rainy season, one household reported that the system had broken down three times but did not provide a reason why.

Figures 17 and 18 show the types of problems reported by households during dry and rainy season visits to urban households. Not all households reported problems. Reported problems fall into the following categories, in order of most reported to least reported issue: leakages (of tank, tap, or gutter); poor water quality; vandalism or theft (often of tap); difficult operations and maintenance; design failure; and quarrels with community about sharing water.

Figure 17. Reported Problems with RWH Systems in Urban Households: Rainy Season (128 households)

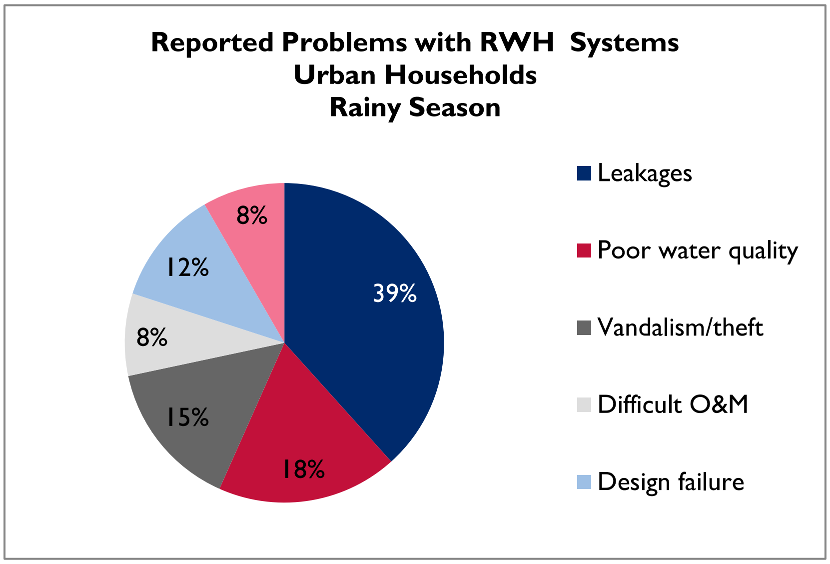
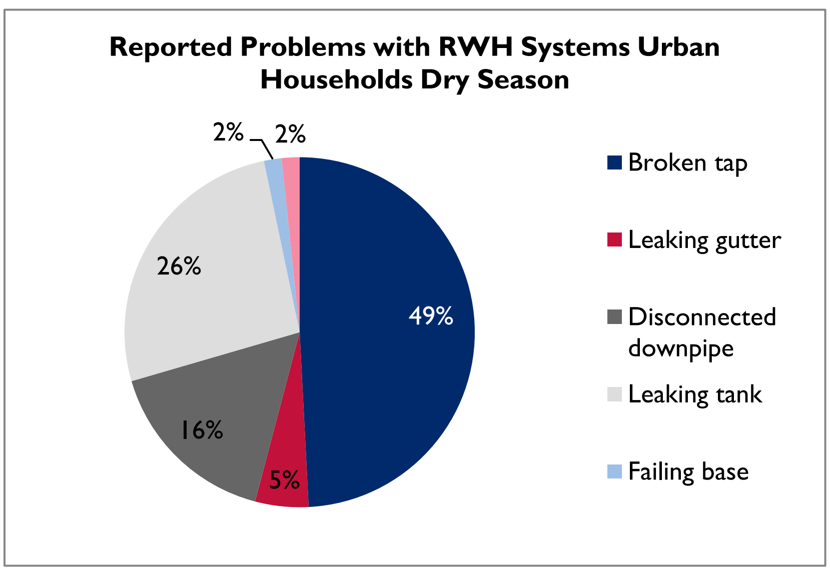


Figure 18. Observed Problems with RWH Systems in Urban Households: Dry Season (139 households)



b. Urban Protected Wells

The evaluation team observed the protected wells during household visits. In the dry season, 91% of the observed wells were fully functional or functioning with some problems. In the rainy season, fewer wells (68%) were fully functional or functioning with some problems. This may be due to the simple fact that a month and a half into the rainy season the protected wells had been used for an extra five months compared to the dry season field visits. Many protected and unprotected wells were also as dry, if not drier, than during the dry season (due to the late onset of the rains), causing some protected wells to be overburdened, resulting in problems.

In urban households with protected wells, 17% reported that the well had never broken down, while others reported that it had broken down once (10%) or twice (5%).

The evaluation team asked households in Epworth, "Are there any problems with water supply from the system?" Only 5% reported that they did not encounter any problems. The problem most reported was that the well was drying up: 35% reported this in the dry season and 45% in the rainy season. The evaluation team was not able to do any hydrogeological investigation, so the reason for wells drying up is unknown. Structural failure, theft of parts, and broken parts were other commonly reported problems.

c. Rural Protected Wells

In the rainy season, 30 of 38 (79%) household protected wells were fully functional; an additional six wells (16%) were functioning with some problems, and two wells (5%) were not operational.

In the dry season, 57% of the households reported that the wells had never broken down since rehabilitation, 14% reported they had broken down once, and 29% reported they had broken down three times. In the rainy season, 83% of the households reported that the wells had never broken down since rehabilitation, 8% reported they had broken down once, and 5% reported they had broken down three times.

The most common problem—reported by five households—in the dry season was that the well was going dry. Other reported problems include broken/missing chains or ropes (reported by three households), and turbid water (reported by two households). Types of problems reported in the rainy season include turbidity, collapsing lining, broken windlass (each reported once) and broken rope (reported twice). Some households reported more than one problem.

d. Urban Schools with RWH Systems

The evaluation team observed infrastructure at 13 tanks in four urban schools. In the rainy season, 100% of the tanks were fully functional or functioning with some problems. In the rainy season 42% of the tanks were fully functional or functioning with some problems. None of the urban RWH schools reported breakdowns. Two reported problems in the dry season related to the tanks not filling up, probably because there was not enough rain in the rainy season, and a resolved problem with the presence of mosquitos.

e. Urban Schools with Other Systems

In the dry season 13% of the systems were not operational but when the evaluation team returned in the rainy season later in the year, all of the urban schools with boreholes or reservoir tanks were fully functional or functioning with some problems.

In the dry season one school reported five breakdowns; two schools reported one breakdown; and two schools reported one breakdown. In the rainy season, one school said the tank never worked, two schools reported an RWH tank had broken down once, and one school said it had had two breakdowns.

Only one school reported a problem: the gutters "throw out" the water so that the tanks do not fill well.

f. Rural Schools with RWH Systems

The evaluation team observed 12 tanks at eight rural schools in the rainy season; 17 tanks were observed at these schools in the dry season. In the dry season, 80% of the tanks were fully functional or functioning with some problems; in the rainy season, fewer tanks (67%) were fully functional or functioning with some problems.

Rural schools reported from one to five breakdowns since installation. One of the tanks has not worked since it was built.

Often schools reported more than one problem. Different problems were reported at the same rural schools, as shown in Figures 19 and 20. One school has conflicts with the community, which wants to use the water during the holidays. The school has difficulty securing the water when no one is there during the holidays.

Figure 19. Reported Problems with RWH Systems, Rural Schools: Dry Season (8 schools)

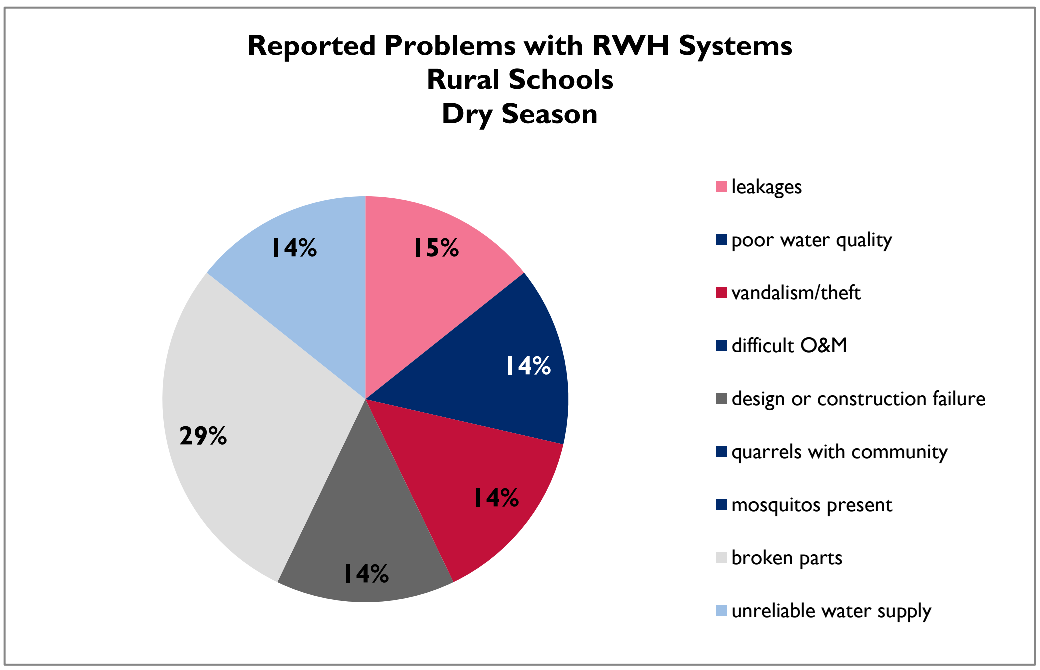
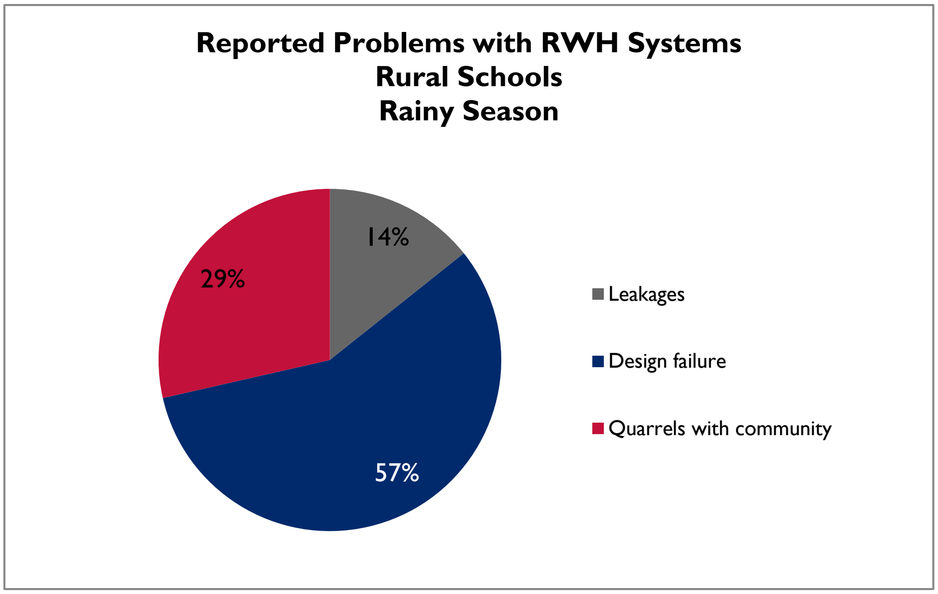


Figure 20. Reported Problems with RWH Systems, Rural Schools: Rainy Season (8 schools)



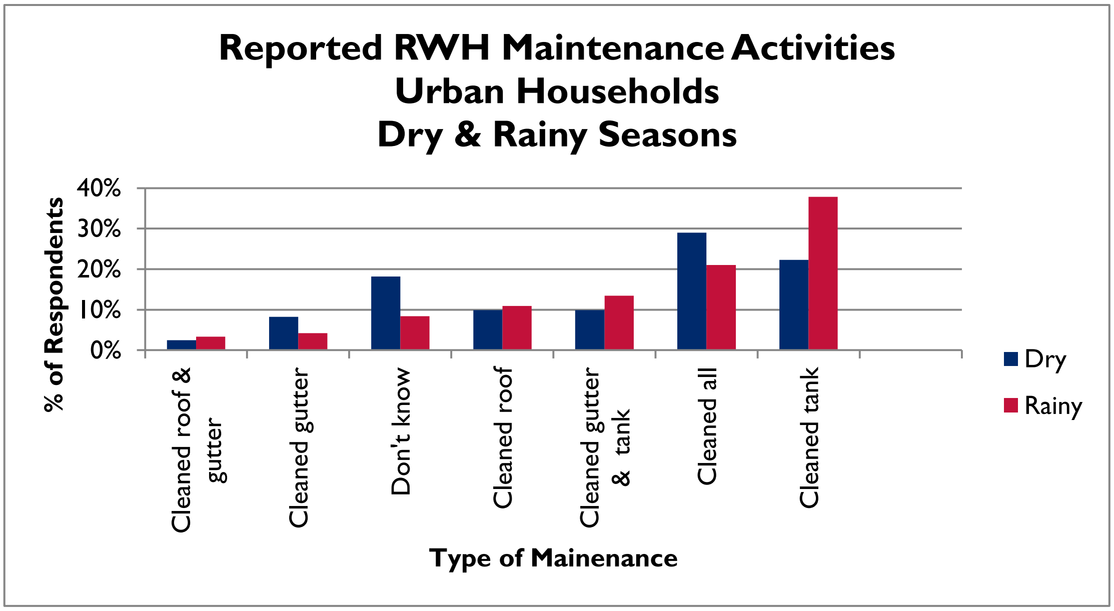
16. What support is available within the community, school, or health facility for maintaining the water supply intervention?

There was no evidence of support by NGOs or private service providers for operations and maintenance of the water supply interventions. In fact, one household reported, "We were not told who to consult for repairs." Another household reported that six community members were originally supposed to maintain RWH systems in their area, but this did not continue when the project ended. The community members have had no contact with the NGO since the project ended. Individuals in another household said they could hire someone for maintenance but that they did not want to pay.

When asked who was responsible for RWH maintenance in urban households, more than 75% responded that a household member was responsible. The second most frequent response was children in the family, at about 13%.

As is seen in Figure 21, people in urban households appear to be doing more maintenance during the rainy than in the dry season. People are more likely, however, to do an overall cleaning during the dry season.

Figure 21. Reported RWH Maintenance Activities, Urban Households: Dry and Rainy Seasons



17. How does the sustainability compare between RWH, boreholes, shallow wells, and spring boxes?

Table 24 compares the functionality rates in dry and rainy seasons for the various interventions the team evaluated. Rural household protected wells have the highest percentage of fully functional systems in the dry and rainy seasons (79% and 85%, respectively). Urban household protected wells have the lowest percentage of fully functional systems in the rainy season (32%). In the dry season, urban schools with RWH systems have the lowest level of fully functional systems (55%).

Table 24. Comparison of Functionality by Intervention Type/Location

	Dry Season			Rainy Season		
Intervention Type/Location	Fully Functional	Functioning with Some Problems	Not Operational	Fully Functional	Functioning with Some Problems	Not Operational
Urban households with RWH systems	58%	34%	8%	58%	34%	8%
Urban households with protected wells	64%	27%	9%	32%	36%	32%
Rural households with protected wells	79%	16%	5%	85%	14%	0%
Urban schools with RWH systems	55%	45%	0%	73%	27%	0%
Urban schools with other	63%	25%	13%	57%	43%	0%

systems						
Rural schools with RWH systems	60%	20%	20%	50%	17%	33%

18. What assumptions and/or challenges related to the policy and enabling environment of Zimbabwe will likely affect sustainability of the RWH, boreholes, shallow wells, and spring boxes?

DDF are responsible for water quality testing post project, but such testing is seldom done due to lack of resources.

At the district level there are local government entities responsible for the water sources that most people depend on, primarily the DWSSC and PWSSC. Responsibility for water sources has been decentralized from ZINWA in Harare to these provincial authorities, but there has not been an effective and concomitant transfer of resources to fulfill their mandate. As a result, boreholes are breaking down and not being rehabilitated in a timely fashion or at all. Municipal water is also being affected due to resource constraints, with households going for weeks without any tap water. As a result, people do not pay their water fees, leaving the water utility in arrears and in turn unable to fulfill its mandate. This vicious cycle has therefore created a need for alternative sources of water provision in the short and medium term.

For comparison, boreholes are established with support/assistance from DDF but the onus is on the Rural District Committees (RDCs) for operation and maintenance costs (Manicaland PWSSC, 2013).

Small problems can often be fixed by the communities themselves. For larger repairs and those requiring spare parts there is a need to get support from a donor or the GoZ (Manicaland PWSSC, 2013). Supposedly the RDCs charge a nominal levy (about US$1) on the Water Point Committees for maintenance, but it is not often paid/collected (Manicaland PWSSC, 2013).

Protected wells and RWH systems, however, do not fall under the purview of the DWSSC or DDF. In the case of Mercy Corps' Reducing Risk to Localized Food and WASH Emergency in Manicaland project, family wells were upgraded in a participatory manner. Custody of the wells remained the sole responsibility of the owning household (for private wells) or community (for communal wells), with the whole user community being encouraged to share use and maintenance of the upgraded wells. Hygiene and system maintenance information was imparted during installation of RWHs in schools to ensure a safe and sustainable source of water. VPMs and Community Water Point Committees (CWPCs) were strengthened by Mercy Corps. This included training in the maintenance and management of community water points, within the context of Community-Based Management of water points, encouraging user communities to take responsibility of the operation and maintenance of water points as well as the raising of financial resources to buy spares. Mercy Corps observed during the implementation phase that the communities led by the VPMs and CWPCs went on to rehabilitate extra water points (boreholes fitted with hand pumps), in addition to those supported by Mercy Corps. However, the effectiveness of these community structures was not apparent during visits to households with protected wells in rural areas.

Similar training was undertaken by other NGOs, including IRD (which produced a training manual on RWH including operation and maintenance), IRC, ADRA, etc. In the instances where community and School Water Point Committees were strengthened, the presence of these was not seen or felt on the ground. Similarly, training was imparted to local artisans/builders on ferrocement and galvanized tank building to ensure possible future replication. However, the evaluation team noted the lack of financing, knowhow, and motivation to fix a simple leaking tap, tank, or gutter.

MedAir went one step further in assuring sustainability of their interventions by providing schools that had RWH systems installed a one-year guarantee certificate from the contractors in case of damages/repairs. That said, no problems were reported a year past the project end date (SI could not independently verify this assertion).

Oxfam GB distributed 60 tool kits to strategic intervention wards to be used for maintenance of water points (namely boreholes) after project's end, albeit not for protected wells in Epworth where SI undertook part of the evaluation.

Area V. Gender Equality and Equity

19. Did the water supply projects ensure the involvement of women and assist men and women equally?

Under IRD's ZIMROOF project, a total of 347 teachers and School Committee Members (47% female) and 10,405 students (49.5% girls) were trained in appropriate hygiene and sanitation practices using IRD's manual. Another 331 clinic staff (57% female) were trained on the usage of WaterGuard. These figures provide evidence of the gender parity exhibited under this particular IRD project.

The final survey of IRD's PROOF II project showed that the program managed to maintain gender equity in provision of rooftop rainwater harvesting tanks, with 43% of female-headed households having rooftop rainwater tanks (compared to 28% of female-headed households without rainwater harvesting tanks).

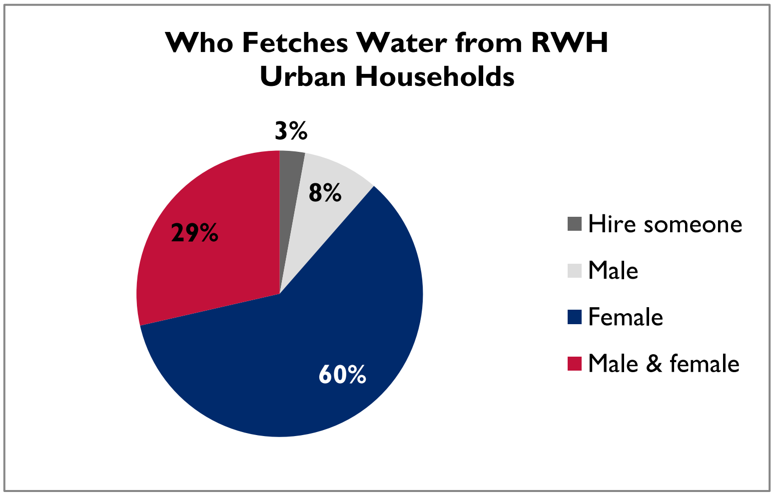
Of note, the Oxfam project—due to the fact that the majority of confirmed deaths during the cholera outbreak were men, as reported by Centers for Disease Control (CDC) mortality reports—shifted its awareness strategies to target more men. It mobilized them to participate in hygiene promotion activities and to become community health volunteers and environmental health technicians, using specific gender output indicators. Nevertheless, over 60% of participants in hygiene promotion sessions were women, probably because men were generally not home during the daytime, undertaking out-of-home livelihood activities (Oxfam GB, 2010).

IRC, in its WASH Focused Disaster Risk Reduction Initiative in Manicaland Province, specifically targeted female heads of households as they were deemed to provide more credible information on household water supply, sanitation, and hygiene.

Concern Worldwide equally made the point that water collection is generally the responsibility of women and children in target communities and as such these groups were the main targets for community awareness-raising on cholera, which emphasized the need to have equal participation of both men and women in any intervention. However, the evaluation team could not see any evidence of this equal participation in the project documents provided due to the fact that indicators were not disaggregated by gender (Concern Worldwide, 2009).

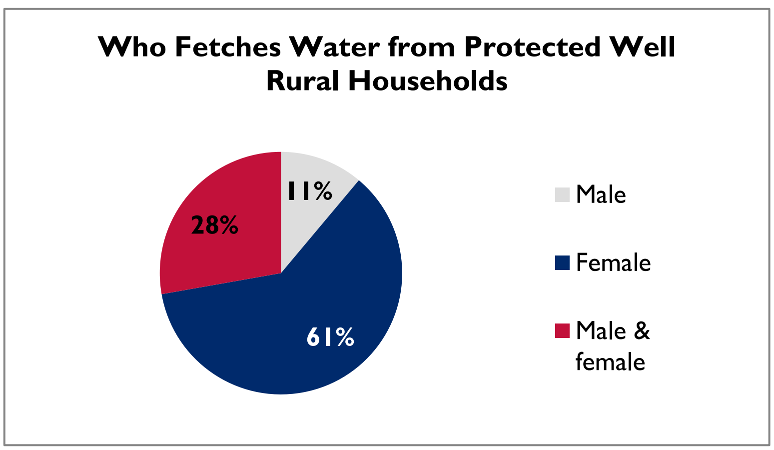
The evaluation team asked key informants the following question on this topic: "Who is responsible for fetching water in the household?" In urban RWH households, 60% of the households reported women and/or girls are responsible for this task (see Figure 22).

Figure 22. Who Fetches Water in Urban RWH Households



In rural households, 61% of the households reported that women and/or girls are responsible for fetching water from the protected wells (see Figure 23). The main difference between Figure 22 and Figure 23 is that urban households occasionally hire people while rural ones do not.

Figure 23. Who Fetches Water in Rural Protected Well Households



In urban areas, 54% of the heads of RWH households are female, and on average 42% of people at those households are female.

At urban households with protected wells, only 14% of the heads of households are female. On average 35% of people at those households with protected wells are female. In rural areas, 18% of the heads of visited households with protected wells are female. In those households, 49% of the household members are female.

20. What additional steps might the water supply projects in Zimbabwe undertake to improve gender equity and equality?

GOAL Zimbabwe, IRD, Mercy Corps, Oxfam GB, IRC, and IMC did disaggregate some indicators by gender, but not the same ones, so comparison across programs is difficult. However, for example, 8,475 internally displaced females (compared to 2,825 males) were assisted by GOAL's interventions, while 301 female and 173 male voluntary health workers were trained in hygiene promotion and cholera-awareness messaging. The project also reached an estimated 300,000 pregnant women (Goal, 2010). ADRA disaggregated coverage across the four wards in Gokwe north and Gweru (urban) by gender, with an average of just over 75% of the beneficiaries positively affected by the project being female. However, the indicators used were not disaggregated by gender. During implementation, low male participation was noted in Community Health Club activities. The NGO learned the importance of engaging men through these clubs in order to encourage them to "see and address the challenges women and children face" on WASH issues (ADRA, 2012).

CONCLUSIONS

Area 1. Overall Performance and Impact

1. What is the overall performance of the USAID/OFDA–funded water supply projects in Zimbabwe implemented since FY2009?

The service levels evaluation indicates that none of the water sources, on average, provides a basic level of service. Water quality, reliability, and quantity are the areas of particular challenge for the interventions. Further detail on related indicators follows. Most users, whether they are USAID beneficiaries or not, likely do not know what they are supposed to do related to their water points (how to run their water point committees; how to report problems and to whom; how to carry out minor repairs, e.g., fixing loose bolts on borehole headworks, cleaning gutters in RWH systems, etc.).

2. To what extent were the stated strategic objectives of increasing access to improved water supply in Zimbabwe achieved? What were the major issues influencing the achievement or non-achievement of the objectives?

Because many households in urban areas use multiple sources, it is difficult to determine the contribution of the USAID-funded sources to an improved water supply. The major issues influencing the achievement or non-achievement of the objectives include the following:

- Changes in rain patterns. In 2013 there was (anecdotally) less rain than expected. This is probably the most important factor.
- Sharing of water sources
- Using water for purposes other than drinking

3. What is the current quality and quantity of water available from the water supply interventions in different seasons and for how many people?

a. Quantity of Water

Using the service level methods, the average quantity of water per person (52 lpcd) is considered intermediate only at rural households with protected wells in the rainy season; it is acceptable (24 lpcd) in the dry season. Urban households with RWH have a basic level of water per person (20 lpcd) only in the rainy season; in the dry season the quantity per person (12 lpcd) is considered substandard.

Because households report using multiple sources, it is hard to determine what their actual overall water access per person is. Clearly, the USAID/OFDA–funded interventions are supplementing the previously existing sources.

b. Quality of water

Poor water quality results can be due to limited or no cleaning of RWH tanks, roofs, and gutters. Those who mentioned a reason for having poor water quality seemed to expect the NGOs to take care of maintenance. Also, some households did not perceive a need to treat water, and others were unwilling to purchase treatment chemicals.

For homes with protected wells, people might not have washed their hands before handling the rope and bucket, leading to contamination of the well water. As mentioned earlier in this report, handwashing with soap and treating water, in particular, are challenges in Zimbabwe, especially in the rural areas, as they are in many countries. GOAL, for example, is moving towards more behavioral change interventions like promoting handwashing and toilet use, with UNICEF support.

Other issues affect water quality as well, such as storing the bucket and chain or rope outside of the well and leaving the well unprotected from children and animals. In rural areas, RWH roofs were not often cleaned, so bird droppings could contaminate the water. In some households, a resident had disconnected the downpipe from the tank for the first rains to allow for water to flush out such debris from the roof. Because of the timing of the visits, the evaluation team is unable to determine whether this is regularly practiced by all households. In homes with protected wells, some latrines were located too close to the well.

4. What are the most significant results these water supply projects have delivered to both direct and indirect beneficiaries since FY2009?

Results of water and hygiene interventions typically include improved health, reduced time fetching water, and increased quantities of water.

Regarding health, the team asked questions about cholera and diarrhea. It is difficult to determine how diarrhea rates in intervention households compare to those without interventions, or whether they are higher or lower now than before the intervention.

As discussed above, handwashing with soap is a critical piece of preventing diarrhea, but it does not seem to be practiced regularly by all. According to the National Coordination Unit (NCU), the RWH intervention is best for handwashing at the institutional level.

A very small number of people mentioned that the tank takes up space in their yard, which they could use to expand the household or extend their garden. This could imply that the income or additional food is more valuable than the water source.

5. Is there evidence that the water supply projects were associated with cholera prevention or mitigation?

Current reported cholera rates are low in urban and rural areas in dry and rainy seasons, but this cannot be attributed solely to USAID-supported interventions, because even where systems have high functionality, households use multiple sources of water, have uneven hygiene practices, and do not regularly treat their water. In addition, the problems with the municipal systems have not been resolved. The evaluation team's findings confirmed the OIG conclusion that RWH would likely not mitigate a large cholera outbreak. Households choose to, or are forced to, share water from their tanks, causing the water to diminish even faster. The fact that rainwater quantities are not reliable means that most households must rely on alternate sources, which might not have good water quality. Borehole water might also be contaminated, according to experts (Mbanje, Zimbabwe: Not All Borehole Water Is Safe - Experts, 2013).

a. Cholera Prevention: Handwashing with Soap

An important part of cholera prevention is handwashing with soap. A greater percentage of urban households reported having soap for handwashing than rural households. This could be due to greater awareness of the need to wash hands with soap in urban areas, easier access to markets with soap, peer pressure from neighbors, and/or higher income levels than rural households.

During the outbreak NGOs flooded the market with soap, which deflated the preexisting market for soap products (GOAL, 2013). Poor households might expect free soap (and water treatment chemicals) to be distributed by NGOs. In fact, several household representatives mentioned "provision of water treatment chemicals" [the team inferred that they meant by the NGO] as a way to improve the system.

b. Cholera Prevention: Perception of Need to Treat

Another way to prevent cholera and other water-borne diseases is to treat water at the point of use (also known as household water treatment). However, as discussed in the findings to Question 3 above, many recipients are not treating water, which could be due to the fact that they think it looks, smells, and tastes good, or that they do not want to purchase water treatment chemicals.

In general, the residents with RWH systems seem to find the RWH more reliable in providing good quality water than other sources they have access to (boreholes and shallow wells) during the rainy season.

As shown in Annex X, water treatment products are relatively inexpensive compared to other household items. Household income is discussed under Question 9. The water treatment products Aquatabs and WaterGuard were mentioned during the team's household visits, suggesting that there is awareness of these methods among household recipients. However, there appears to be an unwillingness to pay for the necessary treatment products. Several households asked for NGOs to provide such chemicals (as noted in the Findings: Quality section). This attitude, which is commonly observed after many WASH interventions around the world, can be a problem if households are not properly handling and storing water, or worse still, if the water coming from the tank is actually tainted by fecal coliforms from dirty roofs/gutters or by dirty taps or dirty receptacles used for water transport.

6. Is there evidence that the water supply projects were associated with drought mitigation?

Many urban residents seemed to view the RWH as a bonus—while connected to piped municipal water, they almost all had multiple sources. However, in Epworth hand-dug wells (protected or unprotected) were the only source available. It is possible that urban RWH households would be more protected from a drought than households in Epworth with protected wells.

7. What evidence is available that demonstrates the RWH activities have been replicated or may be replicated in the future?

The evaluation team saw no evidence of replication of USAID-funded designs. Those households that were interested in building or having an RWH system wanted external financing to do so.
Protected wells have a greater chance of being replicated than RWH due to the relatively lower cost of implementation at about US$400 per well (Oxfam, 2013).

Area II. Efficiency

8. Are the RWHs in Zimbabwe efficient in providing a reliable water source to households year-round? How does this compare to wells in the same communities?

RWH systems are thought to be more reliable by the NGO partners in providing good quality water during the rainy season versus boreholes and shallow wells. However, this capability is drastically reduced during the dry season. Hence, most NGO partners agree that RWH systems should be included as an intervention as a supplement to existing water sources, particularly in areas with high incidence of water-borne diseases (due to open defecation, for example).

One benefit of a year-round supply of water is the ability to maintain a garden or farm, either for income or for nutrition. With respect to gardening, some families might also have plots outside of their compounds. However, it is difficult to attribute these activities directly to the water intervention because many households use multiple sources, as described below. Thus it is difficult to determine whether water from the RWH system is used exclusively for the gardens or whether the gardens existed before the intervention.

9. Are the RWHs in Zimbabwe cost-effective for households and institutions? Please stratify findings by households, schools, and clinics. How does this compare to wells in the same area?

Household income and municipal water fees are discussed in the findings above. One way to look at this is to say the RWH are very cost-effective, because people are neither paying to use or maintain RWH systems nor are they paying for protected wells or boreholes. Compared to the average municipal water bill of $24 per month, free is more cost-effective. The RWH tanks, even without treatment or maintenance, generally provide better water quality than protected wells and probably the municipal water supply (as discussed in findings for Question 3).

The conclusions under Question 10 include a discussion of cost.

10. Were the water supply interventions funded by USAID/OFDA in Zimbabwe well-coordinated with other donors to avoid duplication of effort?

In general there was good coordination among the NGO partners, particularly around RWH. The PWSSC and DWSSC were key stakeholders in any WASH intervention by all NGOs; because of this, duplication of effort was mitigated through their involvement.

Regarding coordination on technology, IRD is seen as the pioneer of RWH in the region and in Zimbabwe in particular. As a result, the other NGOs that implemented RWH systems learned a great deal from IRD's technical knowledge and experience. Such coordination is reflected in the relatively standardized RWH interventions across Zimbabwe. This was not coincidental, as USAID/OFDA encouraged coordination wherever possible, particularly on the use and marketing of WaterGuard with the help of an OFDA-funded PSI project (in the case of ADRA, IMC, OXFAM GB, IRD, and IRC, for example).

Ultimately, the WASH sector in Zimbabwe is relatively well coordinated with an NCU housed in the Ministry of Water Resources Development and Management. This NCU serves as a secretariat to provide day-to-day administration of the WASH sector on behalf of the National Action Committee. The latter is responsible for water resources management and rural and urban WASH. Donors, NGOs, and Community Based Organizations (CBOs) come together during WASH Cluster meetings on a monthly basis, with an NCU representative present at all times.

Area III. Coverage and Design

11. Assess the appropriateness and success of the design of the different USAID/OFDA–funded RWHs implemented in Zimbabwe in various locations, including urban vs. rural settings of households, schools, and health facilities. The assessment will include, but is not limited to, the size and construction quality of tanks, gutters, piping, taps, and roofs.

Most partners assumed that RWH tanks built during their programs would be full in the rainy season but would dry up in the dry season. IRD asserted that their household and school tanks were designed to last year-round for a given number of users. However, the reality is that more households use the RWH systems than designed for, so the tanks run dry about two to four months into the dry season. While schools are able to better control the use of the water from the tanks, it is thought that they can get through the dry season if the school children/employees take the predetermined amount of water (one to two liters/day). But our observations indicate that in reality schools' RWH water supply does not get them through the dry season, either. However, this probably is due in part to the use of the water for purposes not planned for in the design, such as watering gardens and cleaning of school latrines (as described in the findings for Question 4). Other schools share water with community members. Some teachers and administrators take water home with them.

The least expensive design (plastic tank) is not ideally suited for households in high-density urban areas. Plastic tanks, while the least expensive option in urban areas, become more expensive when costs to transport them to remote rural areas have to be factored in. RWH systems in rural areas are also generally not the ideal intervention for households given the lack of appropriate roofing to capture rainwater and on which to install gutters. Galvanized iron and ferrocement tanks are out of reach for the majority of households and institutions, particularly given the lack of investment in the country and the very low purchasing power of the general population.

12. Assess how replicable the current designs of the RWH systems are in Zimbabwe. The RWH systems were intended as "demonstration" systems that could be made replicable if a low-cost design were perfected and demonstrated. Will households, schools, or health facilities be able to afford to construct similar systems without foreign aid?

Given the economic situation in Zimbabwe and the availability of alternative sources, it is unlikely that even a low-cost design would have been replicated without external assistance and financial support. Several people were requesting water treatment chemicals and better buckets, which are inexpensive and easily available in local markets.

Borehole drilling is being limited in urban and peri-urban areas due to water quality issues, over-abstraction, and the fact that the water utility is losing revenue from foregone customers. RWH is seen as an option in this case (by the Government of Zimbabwe) to provide water to communities in the medium term, but there are barriers to its implementation in the long term. For example, RWH is seen as a relatively new technology and so many opt for boreholes wherever possible, mostly because they are (perhaps erroneously) perceived to provide water year-round. RWH systems are deemed permanent structures; they thus require building permits that can be cumbersome to attain. For now, these licenses have been waived for RWH systems because the systems constitute part of an emergency response, but license requirements could prove to be a barrier in the future. Communities by and large provided in-kind contributions to the installation of RWH systems including cement, water, sand, and manual labor. However, the general consensus is that households/schools are not able to replicate the systems without financial support. This is particularly true for rural areas.

Given the present economic climate, Zimbabweans are not in a position to invest in such a system because competing priorities win out. The private suppliers of RWH system components are either wary of the low purchasing power of high-density homeowners or are oblivious to the market potential for RWH systems. The real cost of manufacturing and installing a RWH tank, however, is greater than the mere cost of the tank and must also take into account the gutters, downpipe, and concrete base, as well as the man-hours to manufacture and install the tank. The cost varied widely depending on the type of tank and the NGO installing it (and hence the location of the intervention, including rural vs. urban).

Where there were instances of households/schools showing interest in installing their own RWH system, it was contingent on the support of the respective district and provincial authorities to motivate/mobilize technical and financial assistance; this is not likely to be forthcoming anytime in the near future given the present economic and political climate.

With regards to the RWH tanks manufactured and installed under IRD's projects, the galvanized iron was imported from South Africa because Zimbabwe does not produce galvanized iron or steel. Coupled with the fact the tanks were manufactured and assembled in Harare, this makes replication of this type of RWH intervention very difficult without substantial financial backing. Similarly, for ferrocement tanks built under IRD's ZIMROOF program, materials were sourced in major urban areas and ordered in bulk to save costs. Even though the tank molds were handed over to each building team for use in their own business after the project, the reality is that the cost for materials would be prohibitive in most cases.

While the evaluation team noted no evidence of replication based on USAID-funded interventions during urban or rural site visits, it observed a few homemade RWH systems in the rural areas of Manicaland, namely in Mutasa District.[15] These RWH systems were opportunistic, in one case using an old ferrocement storage tank (using chicken wire and metal from old chain-link fences) and makeshift gutters and in another using makeshift gutters and old industrial metal barrels to store the water. The evaluation team learned that these rainwater harvesting systems were installed on the households' own volition prior to the USAID/OFDA–funded intervention.

13. Assess the storage volume constructed for each household, school, and health clinic. Was the storage volume designed appropriately? Would a different storage volume be more replicable and still reduce cholera risks?

This evaluation confirmed the finding that water in RWH tanks does not last through the dry season. However, regarding quantities, households in the urban areas surveyed collected on average 88 liters of water per day (15 lpcd) during the rainy season from the USAID-funded RWH tanks. During the dry season this figure was down to 62 liters per day (when there was water in the tank), or 11 lpcd. Both per-person quantities were higher than IRD's estimates. A confounding variable at play here is the actual number of people constituting a household. IRD used an estimate of 18 people per household in urban areas. The average reported household size during this evaluation was 10 people, but many households (33 in dry season, 50 in rainy season) reported sharing the RWH water with other households. Household size varied widely depending on the rural vs. urban context and between the different Harare high-density suburbs. Sharing has a strong impact on the amount of water available through the dry season. While some households seemed happy to share the water with their neighbors, others had conflicts with their neighbors or could not prevent neighbors' access to their tank. Vandalism or theft was reported in 15% (rainy) and 16% (dry) of the households.

14. Was vector control required at the water supply site and, if so, how well did it function?

Vector control seems to be working as designed, as the evaluation team observed no mosquitoes or larva.

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[15] During a mapping of water harvesting technologies exercise in Gokwe North by ADRA under its Water and Hygiene Promotion Program, it was noted that a large proportion of households were already practicing some form of rooftop rainwater harvesting.

Area IV. Sustainability

15. Are the water supply interventions currently operational? If not, why?

RWH systems are considered less technical than borehole hand pumps, requiring less maintenance and fewer spare parts. However, this is the very reason why RWH systems may fall into disrepair, as complacency sets in on the part of the community. Missing or broken taps were one of the most common observed issues. They are relatively inexpensive (approximately $5 plus installation) and available at markets. As discussed in the findings for Question 9, the majority of households have more than US$100 per month in income, so replacing a tap seems affordable.

16. What support is available within the community, school, or health facility for maintaining the water supply intervention?

In both the dry and rainy seasons, community ownership (maintenance and repair) of RWH systems was generally lacking. This seems to be related both to sharing and to dependence on the NGO for follow-up. No households mentioned that NGOs had revisited them after the original intervention. In fact, they thought the evaluation teams represented the NGOs and some asked for further assistance or additional tanks. Perhaps because the evaluated projects were in response to an emergency, very little community contribution was required. This led to a lack of ownership and unwillingness to pay for maintenance or repair (described in the findings to Question 16).

Given the resource constraints not only of the central and provincial governments but the general populace, donor-funded WASH projects are at the forefront of water and sanitation provision in Zimbabwe. Although, the entities are in place at the provincial and district level to oversee WASH infrastructure projects, the maintenance and capacity building components will be forthcoming when funding is available.

In general, the protected wells were well maintained; there seems to be more ownership than of RWH systems. This could be due to the fact that the houses had the wells before the rehabilitation and considered the wells their own rather than the NGO's.

There has been a strong trend over the past decade in the water development sector to encourage payment for services. Once a functional management structure is in place, there is a need to adopt user fees to ensure sustainable use of common or shared water resources.

While support of community management was attempted in some of the USAID-funded projects, this evaluation shows that such activities need to be strengthened in future projects or embedded in existing institutions.

17. How does the sustainability compare between RWH, boreholes, shallow wells, and spring boxes?

RWH tanks in urban areas were considered more sustainable than boreholes. Community ownership of boreholes can lead to, for example, lack of maintenance or repair, while RWH harvesting systems are more reliable. However, beneficiaries note that RWH provide water for only four to five months, while boreholes can do so year-round. Communities therefore often have more incentive/motivation to use boreholes (Mercy Corps, 2013).

The evaluation team used the service level ladders to compare sustainability of different water sources based on observations and survey results (Table 25). The service level for all interventions is considered "problematic" using this method. Accessibility for all interventions is high. For protected wells, the quantity is higher than RWH systems but the quality is lower, and they are not reliable (some of the wells go dry).

Table 25. Comparison of Service Levels by Type of Water Source

Location	Household or School	Type of Water Source	Season	Avg. Qty. (lpcd)	Quality[16]	Access (mpcd)[17]	Reliability[18]	Overall Service Level
Urban	Household	RWH	Rainy	15.0	Problematic	<10	Problematic	Substandard
Urban	Household	RWH	Dry	11.0	Good	<10	Problematic	Substandard
Urban	School	Other[19]	Rainy	1.0	Unknown	<10	Problematic	No service
Urban	School	Other	Dry	3.0	Unknown	<10	Problematic	No service
Urban	School	RWH	Rainy	1.6	Acceptable	<10	Problematic	No service
Urban	School	RWH	Dry	0.8	Good	<10	Problematic	No service
Rural	School	RWH	Rainy	1.0	TBD	<10	Problematic	No service
Rural	School	RWH	Dry	1.1	Acceptable	<10	Problematic	No service
Urban	Household	Protected well	Rainy	22.0	Unknown	<10	Problematic	Substandard
Urban	Household	Protected well	Dry	17.0	Unacceptable	<10	Problematic	No service
Rural	Household	Protected well	Rainy	52.0	TBD	<10	Problematic	Substandard
Rural	Household	Protected well	Dry	24. 0	Unacceptable	<10	Problematic	No service

[16] Qualitatively determined based on water quality tests, described in findings for Question 3.

[17] All evaluated interventions are in the house or school yard.

[18] Average functionality status used as a proxy. More than 33% not operational and/or functioning with some problems considered "problematic."

[19] Types of water sources include three storage tanks (reservoirs), one tank connected to borehole, and one tank connected to municipal tap.

18. What assumptions and/or challenges related to the policy and enabling environment of Zimbabwe will likely affect sustainability of the RWH, boreholes, shallow wells, and spring boxes?

A big issue with WASH in Zimbabwe is the inability to get people to pay for the water and sanitation provision. This is compounded by the fact that in most areas there are now boreholes providing “free” water in parallel with piped water system (albeit very sporadically from mains).

NGOs want to see a situation where donors move away from “free input” programs and focus more on community-driven projects based on demand. There is a need to focus on preparedness rather than emergency response. Some NGOs are integrating WASH with health and food security/nutrition; saving and lending groups are being encouraged to provide much-needed financing for the operation and maintenance of water systems as well as community buy-in, all of which would contribute to sustainability.

A complicating issue is that spare parts are usually not available in rural areas and take considerable time and money to acquire, as described in the findings to Question 15 above.

It is also clear that a lack of resources at the central government level poses an ongoing challenge to the provision of safe and reliable water services. This lack of resources is creating a cascade of problems down to local authorities. The NCU appreciates support from partners but needs them to work with all stakeholders (e.g., DDF, ZINWA) in the implementation of the projects.

Area V. Gender Equality and Equity

19. Did the water supply projects ensure the involvement of women and assist men and women equally?

The convenience of the interventions makes it easy for anyone from the family (men, women, and children) to fetch water.

The general assumption is that when interventions target whole households women are positively impacted, while these interventions provide equal assistance to men and women. For example, in the case of ADRA’s Water and Hygiene Promotion Program, women (and children) were the primary beneficiaries of the planned interventions. They stood to benefit the most from improved water sources and hygiene practices given their inherent vulnerability to water-borne and hygiene- or sanitation-related illnesses, their responsibilities for providing water for households, and their caring for the sick. Coverage across the four wards in Gokwe north and Gweru (urban) was disaggregated by gender, and an average of just over 75% of the beneficiaries positively affected by the project were female. However, the indicators used were not disaggregated by gender.

20. What additional steps might the water supply projects in Zimbabwe undertake to improve gender equity and equality?

Please see the recommendations for Question 20 in the following section.

RECOMMENDATIONS

Along with reviewing previous evaluations and program reports, the evaluation team solicited recommendations from community members and key informants, which are presented by the five topical areas of the evaluation: (1) overall performance and impact, (2) efficiency, (3) coverage and design, (4) sustainability, and (5) gender equality and equity.[20]

Area 1. Overall Performance and Impact

Strategic: Given that the overall performance (in terms of service levels) is poor, USAID/OFDA should ensure its partners conduct all water infrastructure interventions, even in emergencies in a manner that considers how to provide ongoing services.

- If the goal is a sustainable and effective intervention that increases supply of water to most Zimbabweans, then USAID/OFDA funds must be channeled to supporting the rehabilitation of existing municipal water supply systems, water treatment and sewage plants for urban and peri-urban households and institutions and/or capacity building for the managers thereof.
- USAID/OFDA and implementing partners could engage in creative public-private partnerships or partnerships within USAID divisions (e.g., the Office of Water) to effect such changes. This is in keeping with USAID Forward's focus on promoting sustainable development through high-impact partnerships and local solutions.[21]

Tactical: In developing water supply programs with its implementing partners, USAID/OFDA should incorporate key components of the evidence-based recommendations from the Triple-S project[22] to ensure ongoing water services that:

- Facilitate or build capacity for a management structure, whether it be community-based, private sector, local government, or a combination. The clear definition of roles and functions and understanding of the relationships between different institutional levels are critical for truly sustainable water services operating at scale.
- **Consider the life cycle costs and how they will be funded**. USAID/OFDA implementing and facilitating organizations should have discussions with relevant local stakeholders (communities, local governments, national governments, etc.) up front to determine who will pay for maintenance, repairs, and eventual replacement of the water system. Income from user fees will need to be combined with government funds to cover life cycle costs.[23],[24]

Strategic: USAID/OFDA should consider funding capacity building through its implementing partners for existing systems and future programs in order to bolster the relevant water service provider and to enable the community to repair and maintain the various water supply systems (Institute of Water and Sanitation Development, 2013) (NCU, 2013).

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[14] Please note: the numbered recommendations under each topical area do not correspond to the topical area's individual questions presented in the findings and conclusions sections.

[21] http://www.usaid.gov/usaidforward

[22] The Triple-S project is a five-year research project on sustainability and water services funded by the Bill and Melinda Gates Foundation through IRC. Sustainable services at scale (Triple-S) project website: http://www.waterservicesthatlast.org/resources/concepts_tools/service_delivery_models

[23] Key findings about costs for different types of water systems can be found on the WASHCost project site: http://campaign.washcost.info/page/75900

[24] According to IRC, "Life-cycle costs are all the costs required to ensuring indefinite services to a specific population in a determined geographical area. These costs include the construction and maintenance of systems in the short and longer term, taking into account the need for hardware and software, operation and maintenance, capital maintenance, the cost of capital, source protection and the need for direct and indirect support, including training, planning and institutional pro-poor support."

Tactical:

- To better enable sustainability of its existing investments, USAID/OFDA should support its implementing partners to develop a program to encourage and enable local entrepreneurs to distribute spare parts, provide services, and/or sell water treatment products (possibly with other non-WASH but WASH-related products such as cement).[25] This is the only one of their commitments that has major barriers.
- USAID/OFDA and implementing partners should consider the models for water management structure below to help increase the sustainability of its water interventions.

Responsibility Structure for Water Management at Different Levels
Adapted from (IRD, 2013)

a. **Household:** Each household member should be included in WASH training. Where there are key figures in water supply and management at the household levels, operations and management training should be conducted.

b. **Institutions/Schools:** Work with existing groups (such as school development committees and school health clubs) or create water management committees within school structures.

c. **Community:** Work with existing groups (such as health clubs or water management committees) or form new groups. Any such group can be targeted to conduct fundraising for money to maintain the system as needed.

Strategic: All of USAID's emergency and development activities should continue to find ways to embed the promotion of good hygiene behaviors within local entities or institutions, since cholera prevention is highly dependent on good hygiene behaviors.

- To prepare for any future cholera outbreak, there is a real need to build the capacity of extension health workers, Ministry of Health and Child Welfare employees, and village health workers.
- Prior to the start of any programming, implementing partners should conduct a capacity gaps needs assessment to ensure targeted support.

Tactical:

- USAID/OFDA should place greater emphasis on the programs it funds through the distribution and promotion of water treatment products, be it through small private enterprise, private-public partnership, or community-based cooperatives. There was some cooperation with PSI programs on WaterGuard distribution in the evaluated interventions, but the lack of widespread treatment indicates the need to strengthen such activities.
- USAID/OFDA could fund its implementing partners to conduct a comprehensive survey of water quality at all water points, which would help to target the areas of greatest need. USAID/OFDA could learn from its colleagues at USAID/DIV on how to increase use of

[25] This is in line with the Government of Zimbabwe's Sanitation and Water for All commitment to "implement a new policy on rural water maintenance which incentivizes the private sector to play a larger role in rural water maintenance." http://sanitationandwaterforall.org/wp-content/uploads/tmp/output-782.pdf.

chlorine by adjusting distribution based on evaluation evidence (Bringing Safe Water to Scale).[26]

- EAWAG (German acronym for Swiss Federal Institute of Aquatic Science and Technology) Aquatic Research Centre is another resource USAID/OFDA and its implementing partners should utilize for hygiene promotion[27].[28] It has developed the Risk, Attitudes, Norms, Ability, and Self-Regulation Model. Its recommendations for hand hygiene promotion based on research are:
  - A designated place and facility for handwashing is a crucial prerequisite for habitual handwashing. (All visited schools were using the RWH water mostly for hand washing and had handwashing stations to enable this hygiene behavior.)
  - Interventions that only raised awareness had no influence on handwashing behavior.
  - The combined intervention (Public Commitment and Tippy Tap) with Maintenance Planning has the highest potential.
- A resource USAID/OFDA and its implementing partners should consider is Oxfam GB's Cholera Outbreak Guidelines (Oxfam GB, 2012) that includes a well survey that helps to target behaviors for improvement. Interventions based on theory and evidence have a higher intervention potential than a standard intervention based on knowledge formation alone. The problem of poor water quality in shallow hand-dug wells (protected or not), or rather well polluting, can be addressed as part of a hygiene education program.

Area II. Efficiency

Strategic: USAID/OFDA and implementing partners should select the most efficient water supply model for the context using the information below and the concepts of the Technology Applicability Framework.[29]

Tactical:

- Unless implementing partners can provide evidence of a design that works well in rural areas, USAID/OFDA should consider funding only RWH systems in a peri-urban setting (closer to markets for parts, artisans for building, and rooftops adequate for water collection).
- RWH lends itself best to institutions such as schools as opposed to households as the former have large rooftop surface area, space for multiple tanks, a narrow use profile for the water collected, and a limited and static user population.

Area III. Coverage and Design

Strategic: Even systems that were functioning well were not able to provide water year-round, in part due to the need to share the water with surrounding households. USAID/OFDA could address these issues by funding water supply programs that ensure full coverage in a defined geographic area (e.g., a suburb or rural village).

Tactical:

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[26] http://www.usaid.gov/div/portfolio/chlorine

[27] EAWAG is a leading organization in researching the evidence base for improved hygiene behaviors - http://www.eawag.ch/index

[28] See for example, http://whconference.unc.edu/files/2014/01/contzen.pdf

[29] http://www.irc.nl/page/80150

- In the suburbs, full coverage could be achieved by supporting the rehabilitation and capacity building for operations of existing municipal infrastructure.
- USAID/OFDA should consider funding a study of the feasibility and benefits of deepening protected wells so that they do not run dry.
- Since the collapsed well linings seemed to be related to poor construction, NGOs should consider construction guarantees (ideally for five years) with their contractors or performance-based contracts.

Strategic: Any OFDA-funded programs that depend on replicability to catalyze further coverage levels should consider working through the private sector or conducting market research, including willingness-to-pay studies.[30]

Tactical:

- If replication and scale are the goals, USAID/OFDA should not fund implementing partners to build galvanized RWH tanks. While they are better designed than other RWH options, they are too expensive if private investment cannot share the cost burden.
- Any future RWH interventions should be undertaken through IRD if at all possible since IRD is recognized as the gold standard by other NGOs.
- Since tanks with locked taps appear to have more water, OFDA's NGO partners should include locks and protection for taps. This should be part of the design for all RWH tanks to help users regulate water use and prevent a common type of vandalism. USAID-funded protected wells should also be made deeper where possible so that they do not run dry and well linings should be made sturdier.
- Future water supply interventions would benefit from an additional storage subcomponent or, at the very least, from encouraging RWH system owners to use the tanks for other water storage (e.g., from the municipal tap) in the dry season. This should be done in combination with water treatment promotion.

Area IV. Sustainability

Strategic: USAID/OFDA and its implementing partners should focus on capacity building of beneficiary communities and service providers in combination with building or supporting stronger supply chains. This is particularly important if the GOZ does not include a stronger focus on capacity building during project implementation. Before any programming, implementing partners should conduct a capacity gaps needs assessment to ensure targeted support

Strategic: USAID/OFDA should consult with one of the development banks or the African Council of Ministers of Water on ways to provide support to DDF on the budgetary front if they are to effectively undertake their mandate (IMC, 2013). Water point responsibility lies with the DDF, but they are not involved in implementation after initial identification of communities and training. They do not have the resources to even buy fuel for their vehicles and are woefully understaffed.

Tactical: In many cases, the most cost-effective intervention would be for USAID/OFDA to fund its implementing partners to facilitate the repair of broken down pumps and training to maintain these. A revolving fund/access to micro-credit/savings mechanisms could be put in place to provide necessary

[30] http://www.ird.org/uploads/IRD_RWH_Guide_10June13.pdf

monies to buy spare parts when the time arises. This would be particularly useful in rural areas, since the reality is that DDF is an entity that requires support in order to undertake its mandate of maintaining rural water points. In rural (and peri-urban areas) boreholes with handpumps lay idle as DDF and the communities are not able to repair them.

Community Ownership

The following recommendations concern community ownership.

Strategic:

OFDA should focus water supply efforts on areas that do not have existing water sources (e.g., boreholes, existing hand pumps, protected wells). In the case of rural areas in Manicaland, and Mutasa in particular, it was government policy to drill boreholes in such a way that no household is more than 500 meters from a borehole. Water interventions should be targeted by looking at the district's needs and demands. Projects have to be initiated from districts, and communities have to choose what they are comfortable with (NCU, 2013).

OFDA should ensure that community ownership is built in a participatory way.[31] USAID's NGO partners should follow IRD's best practices guide (IRD, 2013), which recommends several steps for developing community ownership, including:

- Participatory needs assessment
- Participatory technology selection
- User contributions
- Collaboration with government, local authorities, and partners
- Gender considerations
- System management and training

Tactical:

- NGOs should establish or strengthen existing water management committees to ensure sustainability; this could mean engaging communities and/or institutions that have a permanent presence in the area to participate in the process to create institutional memory (Institute of Water and Sanitation Development, 2013).
- USAID/OFDA should encourage its implementing partners to ensure systems and resources for operations and maintenance training and support for RWH systems, as even very simple tasks were not being done at a household level to keep the systems functioning. Supporting local service providers such as welders to fix or replace taps could help improve the functionality of RWH tanks in the future. However, it is not clear whether households are willing to pay for such services since they have access to other water sources if their RWH tanks are not functioning.

[31] IRD has learned from its many RWH interventions that "Participation engenders community ownership, which is a priority in all development interventions, and must occur at every stage of the project. In particular, local stakeholders offer an in-depth knowledge of the community's political, economic, social and technological status which contributes to a program's design and viability." (IRD, 2013)

Area V. Gender Equality and Equity

Strategic: Following best practices does not seem to be enough to ensure ongoing gender equity. USAID/OFDA and its implementing partners should use "next practices," which go beyond best practices by using evidence to innovate and incorporate mainstreaming gender issues into the design, planning, and maintenance stages of OFDA-funded projects to ensure that appropriate and sustainable systems are in place, which are adapted to the various cultures and religions.

Tactical:

- USAID/OFDA should use common indicators across all USAID/OFDA programs to allow for comparison of methods and results, both among USAID-funded programs and with programs funded by other donors. This way, it will be possible to determine which methods are most successful and can thus be scaled up. Annex XI shows the World Bank monitoring indicators and evaluation questions for gender issues in water and sanitation.
- IRC has developed Ten "Golden Rules" for a Gender Approach in Drinking Water and Sanitation Programmes (provided in Annex XII). In addition to these, USAID/OFDA should ensure its NGO partners have considered the following questions before implementing water interventions, although the specific questions to ask may vary according to the technology being employed:
    - Who controls water sources?
    - Who is responsible for maintaining the water supply?
    - Who is responsible for managing water use at the household level?
    - What cultural traditions influence women's involvement in water issues?
    - How can women be involved in the project at all stages?
    - How should women be involved—for example, by using existing women's groups? Or by ensuring a quota for their membership in any committees formed?

ANNEXES

ANNEX I: EVALUATION STATEMENT OF WORK

C.1 EVALUATION OBJECTIVES AND CRITICAL QUESTIONS

This evaluation shall address the following questions during both the rainy and dry seasons:

C.1.1 Overall Performance and Impact

1. What is the overall performance of the USAID/OFDA–funded water supply projects (See Section J) in Zimbabwe implemented since FY2009?
2. To what extent were the stated strategic objectives of increasing access to improved water supply in Zimbabwe achieved? What were the major issues influencing the achievement or non-achievement of the objectives?
3. What is the current quality and quantity of water available from the water supply interventions in different seasons and for how many people?
4. What are the most significant results these water supply projects have delivered to both direct and indirect beneficiaries since FY2009?
5. Is there evidence that the water supply projects were associated with cholera prevention or mitigation?
6. Is there evidence that the water supply projects were associated with drought mitigation?
7. What evidence is available that demonstrates the rainwater harvesting (RWH) activities have been replicated or may be replicated in the future?

C.1.2 Efficiency

8. Are the RWHs in Zimbabwe efficient in providing a reliable water source to households year-round? How does this compare to wells in the same communities?
9. Are the RWHs in Zimbabwe cost effective for households and institutions? Please stratify findings by households, schools and clinics. How does this compare to wells in the same area?
10. Were the water supply interventions funded by USAID/OFDA in Zimbabwe well-coordinated with other donors to avoid duplication of effort?

C.1.3 Coverage and Design

11. Assess the appropriateness and success of the design of the different USAID/OFDA–funded RWHs implemented in Zimbabwe in varying locations, including urban vs. rural settings of households, schools, and health facilities. The assessment will include, but is not limited to, the size and construction quality of tanks, gutters, piping, taps, and roofs.
12. Assess how replicable the current designs of the RWH systems are in Zimbabwe. The RWH systems were intended as "demonstration" systems which could be made replicable if a low-cost design were perfected and demonstrated. Will households, schools, or health facilities be able to afford to construct similar systems without foreign aid?
13. Assess the storage volume constructed for each household, school, and health clinic. Was the storage volume designed appropriately? Would a different storage volume be more replicable and still reduce cholera risks?
14. Was vector control required at the water supply site and, if so, how well did it function?

C.1.4 Sustainability

15. Are the water supply interventions currently operational? If not, why?
16. What support is available within the community, school, or health facility for maintaining the water supply intervention?
17. How does the sustainability compare between RWH, boreholes, shallow wells, and spring boxes?
18. What assumptions and/or challenges related to the policy and enabling environment of Zimbabwe will likely affect sustainability of the RWH, boreholes, shallow wells, and spring boxes?

C.1.5 Gender Equality and Equity

19. Did the water supply projects ensure the involvement of women and assist men and women equally?
20. What additional steps might the water supply projects in Zimbabwe undertake to improve gender equity and equality?

C.2 METHODOLOGY

The successful offeror shall submit a detailed draft evaluation design and methodology; however, it is anticipated that the final methodology will be developed collaboratively between the proposed evaluation team and USAID/OFDA technical and regional program staff in Zimbabwe and Washington, D.C.

In order to ensure the maximum value for learning and use, a description of the proposed evaluation methodology should include at a minimum:

1. Evaluation study design (e.g. pre and post-test comparative cross-sectional descriptive study, pre and post-test with a control group, time series, other panel design, or other).
2. Description of evaluation methods and outcomes and how they can be applied to this evaluation. Upon initiation of the contract work, and once the contractor has the required information, the contractor will be expected to make a recommendation as whether this evaluation should be an impact evaluation or a performance evaluation, as delineated in the USAID's Evaluation Policy manual.

[http://transition.usaid.gov/evaluation/USAIDEvaluationPolicy.pdf]

- ✓ According to this policy, impact evaluations are based on models of cause and effect and require a credible and rigorously defined counterfactual to control for factors other than the intervention that might account for observed change.
- ✓ Performance evaluations, however, focus on descriptive and normative questions: what a particular project or program has achieved (either at an intermediate point in execution or at the conclusion of an implementation period); how it is being implemented; how it is perceived and valued; whether expected results are occurring; and other questions that are pertinent to program design, management and operational decision making. Performance evaluations often incorporate before-after comparisons, but generally lack a rigorously defined counterfactual.

This evaluation can be either an impact or performance evaluation based on determination of the contractor. This determination will be discussed during the kick-off meeting.

1. Methods of data collection (e.g. statistically representative quantitative data collection using a household survey questionnaire, use of defined counterfactuals including control and treatment groups, convenience sample of selected communities and groups using qualitative interview guides, other).
2. Plans for analysis (e.g. identify variables for a test of statistical correlation, matched controls, regression analysis to account for confounding variables, etc.)
3. Measures and plans undertaken in order to ensure protection and confidentiality during data collection.

C.2.1 Evaluation Study Design

The focus of activities/programs contained in Section J3 have been identified for the evaluation. Given the nature of the water supply projects designed in Zimbabwe and the identification of programs that reflect different stages in implementation and anticipated outcomes, it is anticipated that an evaluation study design will include a combination of qualitative analysis with time-bound descriptive qualitative data. In describing the evaluation study design, applicants are expected to justify the selection and application of methods.

The proposed evaluation design may include but is not limited to a comparison between USAID/OFDA–funded water supply projects in Zimbabwe with results from similar assistance funded by other donors in other parts of Zimbabwe.

C.2.2 Data Collection Methods

It is anticipated that the evaluation will include qualitative and quantitative data collection from a representative sample (or a convenience sample, if justification and selection criteria are provided) of USAID/OFDA funded water supply programming. Proposals should include a description of specific data collection methods, an outline of data collection tools to be developed (including a description of how such tools will be developed and with whom), and a scope and timeline for data collection.

Examples of qualitative data collection appropriate to the Zimbabwe water supple evaluation shall include (but are not limited to) the following:

- Structured individual or focus group interviews with end-users or the general population, through an appreciative inquiry approach or other method.
- Structured interviews with program managers, water supply engineers, community programming leads, community leadership and representative from other comparable program may also be appropriate.

Examples of quantitative data collection shall include (but are not limited to) the following:

- Observation checklists designed to rank, score, or rate water supply interventions;
- Assessment and quality/effectiveness ranking lists of reports, communications, and the documents generated as a result of the water supply program; and
- Tools to capture various quantitative variables that reflect the success or failure of specific aspects of the water supply projects.

C.2.3 Data Analysis

Proposals shall provide plans for the analysis of all qualitative and quantitative data collected. Analysis of quantitative data that includes tests for statistical correlation between the following quantitative variables could prove valuable for the evaluation:

- Quantities of beneficiaries served, numbers of different types of water supply interventions;
- Water supply training and related community practice/behaviors (i.e., application of skills taught) related to proper equipment installation and maintenance; and
- Other quantifiable factor such as number of training hours.

Qualitative data should be analyzed appropriately and recognition of the value of rich, ethnographic and descriptive personal and perceptual data evident in the analytical approach outline in the proposal.

The analysis should identify any barriers or constraints to adaptation and application of the water supply interventions as well as unanticipated circumstances (e.g. political or policy environment changes, natural disasters of an enormous scale, etc.) that could have influenced the outcomes positively or negatively. Analysis should also include recommendations on any improvements that can be made to the technical design of RWH in Zimbabwe.

C.3 Activities/Deliverables

C.3.1 Kick-Off Meeting (Washington, D.C.)

An initial kick-off meeting will held in Washington, DC on March 27, 2013. The evaluation team shall meet with staff from USAID/OFDA and other knowledgeable parties. The contractor shall also include strategic assessments, grant documents, situation reports, and other relevant documents, as necessary.

C.3.2 Draft Work Plan

The Implementation Plan must include the anticipated schedule and logistical arrangements and delineate the roles and responsibilities of members of the evaluation team. The draft Implementation Plan shall be submitted to the COR no later than April 5, 2013. This must include the timeframe for conducting an evaluation for both the rainy and dry seasons in accordance the activities outlined in C.3.6, C.3.7, C.3.8, and C.3.9.

C.3.3 Draft Inception Report (Evaluation Design)

The draft Inception Report will be provided to OFDA no later than April 19, 2013 for review.

C.3.4 Final Inception Report (Evaluation Design and Implementation Plan)

The Evaluation Design will include a detailed evaluation design matrix (including key questions, and the methods and data sources used to address each question), draft questionnaires and other data collection instruments, known limitations to the evaluation design, and the final Implementation Plan. The final Design shall be submitted no later than May 1, 2013 and shall be approved by the COR.

C.3.5 Kick-off Meeting (Zimbabwe Mission)

The evaluation team will meet with USAID/Zimbabwe upon arrival in Harare to brief the country team as to the evaluation in-country methodology and coordinate logistical/administrative arrangements. The duration of the visit may involve, but is not limited to, meeting with representatives of the U.S. Government, Government of Zimbabwe, other donors, international NGOs, local NGOs, UN organizations, and other relevant agencies. Systemic data collection of trained data collection experts should also take place during this period.

C.3.6 Presentation of Preliminary Findings and Recommendations for Rainy Season (Zimbabwe Mission)

After conclusion of the field data collection during the rainy season, the team shall provide an oral briefing of its findings and recommendations to the relevant USAID/Zimbabwe management prior to leaving Zimbabwe. The Washington, DC team will join this meeting via conference call; therefore all documentation (i.e. PowerPoint slides) must be submitted to the COR 2 days prior to the meeting.

C.3.7 Presentation of Preliminary Findings and Recommendations for Rainy Season (Washington, DC)

The team will also provide an oral briefing of the rainy season findings and recommendations to USAID in Washington, DC, although USAID/Zimbabwe will join this meeting via conference call; therefore, therefore all documentation (i.e. PowerPoint slides, etc.) must be submitted to the COR 2 days prior to the meeting. The preliminary findings and recommendations shall be completed no later than **May 1, 2013**.

C.3.8 Presentation of Preliminary Findings and Recommendations for Dry Season (Zimbabwe Mission)

After conclusion of the field data collection during the dry season, the team shall provide an oral briefing of its findings and recommendations to the relevant USAID/Zimbabwe management prior to leaving Zimbabwe. The Washington, DC team will join this meeting via conference call; therefore all documentation (i.e. PowerPoint slides) must be submitted to the COR 2 days prior to the meeting.

C.3.9 Presentation of Draft Final Evaluation for both Rainy and Dry Seasons (Washington, DC)

The team will also provide an oral briefing of the Draft Zimbabwe Water Supply Evaluation

Report, including both the rainy and dry season findings and recommendations, to USAID in Washington, DC, although USAID/Zimbabwe will join this meeting via conference call; therefore, therefore all documentation (i.e. PowerPoint slides, etc.) must be submitted to the COR 2 days prior to the meeting.

C.3.10 Draft Zimbabwe Water Supply Final Evaluation Report

Findings from the evaluation will be presented in a draft report at a full briefing in Washington, DC with USAID/OFDA, USAID/Zimbabwe, and possibly key stakeholders. Time allotted for preparing a DRAFT written report is 30 days.

C.3.11 Draft Zimbabwe Water Supply Final Evaluation Report, with OFDA Input

A draft report incorporating OFDA's input will be submitted within 7 days after the presentation in Washington, DC.

C.3.12 Final Evaluation Report

The Final *Zimbabwe Water Supply Evaluation* Report will be provided to USAID/OFDA in electronic form within 15 days following receipt of comments from USAID/OFDA. The report shall include an executive summary and shall not exceed 70 pages (excluding appendices). The executive summary shall be 3-5 pages in length and summarize the purpose, background of the project being evaluated, main evaluation questions, methods, findings, conclusions, and recommendations and lessons learned.

Following the final oral briefings and taking into account any new information obtained and feedback provided, the evaluation team will prepare and print a final bound version of the evaluation report and submit it in hard copy and electronic form to the COR identified in Section **G.1.2 Technical Direction**.

The final evaluation report shall contain the following:

1. Executive Summary
2. Table of Contents
3. Introductions (purpose, audience, synopsis—one page)
4. Methodology (i.e., data collection, analysis, selection criteria/sampling, constraints/limitations)
5. Analysis/Results (e.g., an objective accounting of an analysis of the data)
6. Findings and Conclusions
7. Recommendations
8. References (include all documents reviewed, including background documentation and records of technical data application and decision-making)
9. Annexes (these may include: the Statement of Work; any 'statements of differences regarding significant unresolved difference of opinion by funders, implementers, and/or members of the evaluation team; all tools used in conducting the evaluation, such as questionnaires, checklists, survey instruments, and discussion guides; sources of information, properly identified and listed; disclosure of conflicts of interest forms for all evaluation team members, either attesting to a lack of conflict of interest or describing existing conflict of interest.

Furthermore, the report shall meet the following criteria as stated in USAID's Evaluation Policy

Guide (http://transition.usaid.gov/evaluation/USAIDEvaluationPolicy.pdf):

- The evaluation report should represent a thoughtful, well-researched and well organized effort to objectively evaluate what worked in the project, what did not, and why.
- The evaluation report should address all evaluation questions included in the scope of work.
- The evaluation report should include the scope of work as an Annex. All modifications to the scope of work, whether in technical requirements, evaluation questions, evaluation team composition, methodology or timeline shall be agreed upon in writing by USAID/OFDA.
- Evaluation methodology shall be explained in detail and all tools used in conducting the evaluation such as questionnaires, checklists, and discussion guides will be included in an Annex to the final report.
- Evaluation findings will assess outcomes and impacts using gender disaggregated data.

- Limitations to the evaluation shall be disclosed in the report, with particular attention to the limitations associated with the evaluation methodology (selection bias, recall bias, unobservable differences between comparator groups, etc.).
- Evaluation findings should be presented as analyzed facts, evidence and data and not based on anecdotes, hearsay, or the compilation of people's opinions.
- Findings should be specific, concise, and supported by strong quantitative or qualitative evidence.
- Sources of information need to be properly identified and listed in an Annex, including a list of all individuals interviewed.
- Recommendations need to be supported by a specific set of findings.
- Recommendations should be action-oriented, practical, and specific, with defined responsibility for the action.

ANNEX II: EVALUATION METHOD LIMITATIONS

Evaluation Design Limitations
The evaluation design has the following limitations:

- Due to resource limitations and an extensive number of evaluation questions focused on performance vs. impact, the design did not enable the team to determine the association between each water supply intervention and disease occurrence.
- Water usage was self-reported at the household level and could not be measured per person. The evaluation team estimated daily per capita usage based on the reported number of people in the household.
- The USAID/OFDA interventions evaluated in this report were initiated at different time periods – some over four years ago. This made is difficult to draw conclusions regarding the comparative effectiveness of each intervention type.
- Results from Manicaland may not be generalizable to other rural areas of Zimbabwe

Data Collection Challenges
The looming general elections before the site visits in July 2013 and the heated political conditions leading up to them was a concern for NGOs working in rural areas and in the high-density suburbs of Harare (Chitungwiza/Mbare/Epworth, etc.). In fact, the team was in Mutare ready for visits to rural intervention areas when we were alerted by the NGO that the Provincial Administration would not allow our visits due to the upcoming elections.

The ability to collect samples for water quality analysis was also limited by the number of sample bottles available from the CIMAS lab (30 at a time). Thus, the team focused the water quality sampling on RWH tanks, which were of particular interest to USAID/OFDA, and protected wells, which have high potential for contamination. Some water quality analyses could not be completed because there was not enough water in the sample or it was too turbid. The sampling also focused on sources where the water quality is affected by seasonal variations. The quality of borehole water, which is drawn from deep groundwater sources, should not be affected by seasonal variations to the same degree as shallow wells and RWH tanks, which are replenished directly from rainwater. Furthermore, many of the USAID-funded projects closed more than two years before the evaluation, meaning not all NGOs have a current presence in the former intervention area. Furthermore, staff turnover meant that key informants might not have had a full understanding of the interventions being evaluated. Other data collection challenges included:

- Obtaining clearance from police in each suburb
- Locating households in areas with no street signs or house numbers
- Delayed rural data collection because of very little rains in the area following the rainy season
- People were not home; or even if someone was home, it was not necessarily the person who knew the answers to our questions; and
- Translation issues. Many of the respondents did not speak English so the evaluation team translated the questions to the appropriate local language (usually Shona) and the answers were translated back to English. Some of the nuances of the questions and/or the answers could have been lost in translation.

<u>Self-reporting bias</u>

Proxy indicators measure a condition that is related to the behavior of interest. For example, whether or not a household has soap at the place they wash hands most often, suggests that appropriate materials are available and convenient to use for handwashing by household members. However, it does not reveal how often, or when hands are washed. By definition, proxy measures "yield information that is an approximation of true handwashing behavior, but many of them are more efficient to collect than direct structured observation and more objective than self-report methods" (UNICEF, 2013). Given the team's limited available time to do a large number of surveys, to estimate handwashing behaviors, the team used self-reporting and a proxy indicator. Self-reporting handwashing is vulnerable to bias, as people often understand that you want them to wash their hands. To confirm, we asked to see soap, but it is possible that soap is just used for laundry.

Recall bias

Several of the questions on the survey could be affected by recall bias, which is a systematic error caused by differences in the accuracy or completeness of the recollections by study participants regarding events or experiences from the past. For example:

- Cholera since 2009 for any member of the household
- Diarrhea in last week
- Last maintenance date and activities
- When was water system installed
- Number of people in the household
- How many times has the system broken down since it was installed

This was perhaps exacerbated by turnover in the households and the fact that the team talked to different representatives at some households in the dry and rainy season. Because the team showed up unannounced, the most knowledgeable person about the water intervention and the household characteristics might not have been interviewed.

Due to time limitations, the team reduced the number of questions asked of the same households during the dry season. One of those questions was about the types of water sources used. During the dry season visits, the team did ask what sources the household / school used most in both dry and rainy seasons, but did not ask the time to fetch water from each of those sources in rainy and dry seasons.

ANNEX III: DATA COLLECTION INSTRUMENTS

This annex includes examples of the following data collection tools:

- Key informant interview questions
- School non-RWH water intervention survey – dry and rainy season
- School RWH survey – dry season
- School RWH survey – rainy season
- Household RWH survey – dry season
- Household RWH survey – rainy season
- RWH observation checklist – dry season
- RWH observation checklist – rainy season
- Other Water System Survey – dry season

  Other Water System Survey – rainy seasons

Key Informant Interview Questions

1. Did the NGOs coordinate with other stakeholders in The Zimbabwe Water Project?
2. Is there evidence of replication of RWH, Wells etc.?
3. What support is available in the district or communities to support the water supply interventions?
4. Is there any evidence that the water supply projects were associated with cholera prevention or mitigation?
5. How does the sustainability compare between RWH, boreholes, shallow wells and spring boxes?
6. What assumptions or challenges related to the policy and enabling environment of Zimbabwe will likely affect sustainability of the RWH, boreholes, shallow wells and spring boxes?
7. What are your recommendations for future programs?

ZIMBABWE WATER INFRASTRUCTURE EVALUATION
CONFIDENTIAL INFORMATION

QUESTIONNAIRE CODE NUMBER				

SCHOOL SURVEY OTHER WATER SYSTEM

DATE OF INTERVIEW: ______________________ SEASON DRY [ ] RAIN [ ]
ENUMERATOR NAME:______________________Implementing Organization:_______________
Province: ________________________ District:______________________________
City/Ward Name:______________________ Village/ Suburb Name:______________________
School name: ____
Address / GPS Coordinates____
Name of Respondent:______________________ Sex M [ ] F[ ]
Type of water system funded by USAID:____

SECTION A: School Information
A1: How many students are enrolled? _______________
A2: Approximate percentage of girls?_____________
A3: Approximate percentage of boys?_________________
A4: What wards/neighborhoods/suburbs does this school serve? __________________________

SECTION B: Costs
B1: How much does the school spend on water per month? US$[ ]
B2: Where does your water budget come from?

SECTION C: WATER SUPPLY
C1: Which of the following water sources does the school use?
RWH [ ] Other tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ]
Dam [ ] Stream [ ] Municipal tap [ ]

C2. Mark the sources most used by the School in the DRY season (April – October)
RWH [ ] Other tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ]
Dam [ ] Stream [ ] municipal tap [ ]

C3. Mark the sources most used by the School in the RAINY season (November – March)
RWH [ ] Other tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ]
Dam [ ] Stream [ ] municipal tap [ ]

The following questions are regarding USAID-funded system ONLY

C4: How do you rank water supply from the water system? [ ]
CODE 1 = Very Poor 2 = Poor 3 = Good 4 = Very Good 5 = Excellent
C5: List the benefits brought by the water system
. ...
C6: Who is responsible for maintaining and repairing the water system?
____
C7: How many times has the water system broken down since it was constructed? [ ]
C8: How much water do you collect from the Water system per day? [ ] litres
C9: What do you use water fetched from the Water system for?
____
C10: Is water fetched from the Water system enough to meet your needs?
YES [ ] NO [ ]
C11: How do you rank the quality of water from the system? [ ]
CODE 1 = Very Poor 2 = Poor 3 = Good 4 = Very Good 5 = Excellent
C12: Are there any problems with water supply from the system?
____
C13: What can be done to improve water supply from the system?
....
C14: Are you willing to construct your own household Rainwater Harvesting tank? Yes / No
C15: Do you know how much it costs to build a RWH System? US$[ ]

Page **1** of **2**

C16: What do you use water fetched from the RWH System for?
1. ______
2. ______
3. ______
4. ______
5. ______

C17: Is water fetched from the RWH System enough to meet the needs of the scchool?
YES [ ] NO [ ]

C18: Is there water in the tanks now? YES [ ] NO [ ]

C19: If no, when did the tanks go dry?

C21: Does anyone besides the students or teachers use water from this RWH tank? If yes, who
______

C22: How do you rank the quality of RWH water? [ ]
CODE 1 = Very Poor 2 = Poor 3 = Good 4 = Very Good 5 = Excellent

C23: Is water from RWH odorless? YES [ ] No [ ]

C24: Is water from RWH colorless? (no suspended or dissolved material) YES [ ] No [ ]

C25: Does water from RWH taste good? YES [ ] No [ ]

C26: Are there any problems with water supply from the Rainwater Harvesting System?
1. ______
2. ______
3. ______
4. ______

C29: What can be done to improve water supply from the Rainwater Harvesting System?
1: ......
2: ......
3: ......
4: ......

SECTION D: SANITATION & HYGIENE

D2. Do you have soap available for handwashing? YES [ ] NO [ ]

D3. If YES, can we see the soap? Soap observed? [ ] Soap not observed [ ]

If you don't have soap, why not?

RAINWATER HARVESTING SYSTEMS - OBSERVATION CHECKLIST

TECHNICAL OBSERVATIONS

1. Estimated quantity/volume of water currently available in tank ______ cubic meters
[other units______]
2. Water quality sample taken? YES [ ] NO [ ] ID______
3. Presence of vector control? YES [ ] NO [ ]
Lids [ ] Screens [ ] Larvacide [ ] Other ______
4. Presence of mosquitoes or larvae in or around the RWH YES [ ] NO [ ]
5. Operational status of water supply system:
Fully functional [ ] Functioning with some problems [ ] Not operational [ ]

If not fully functional, describe observed problems

______

6. Is there any evidence of leaks? YES [ ] NO [ ]
7. Are the gutters connected? YES [ ] NO [ ]
8. If the gutters are not connected, what is the reason?______
9. Is the area around the tank clean YES [ ] NO [ ]

If no, describe:______

OTHER OBSERVATIONS

10. Is there any other source of water connected to the RWH tank? YES [ ] NO [ ]

Describe______

List any photographs taken here:

Page **2** of **2**

ZIMBABWE WATER INFRASTRUCTURE EVALUATION
CONFIDENTIAL INFORMATION

QUESTIONNAIRE CODE NUMBER				

SCHOOL SURVEY

DATE OF INTERVIEW: ______________________ SEASON DRY [ ] RAIN [ ]

ENUMERATOR NAME:______________________**Implementing Organization:**_______________

Province: _________________________ **District:**______________________________

City/Ward Name:______________________ **Village/ Suburb Name:**______________________

School name: ____

Address / GPS Coordinates____

Name of Respondent:________________________ **Sex** M [ ] F[ ]

SECTION A: School Information

A1: How many students are enrolled? _______________

A2: Approximate percentage of girls?_____________

A3: Approximate percentage of boys?_________________

A4: What wards/neighborhoods/suburbs does this school serve? ___________________________

SECTION B: Costs

B1: How much does the school spend on water per months? US$[ ]

B2: Where does your water budget come from?

SECTION C: Water Supply

C1: Which of the following water sources does the school use?

RWH [ ] Other tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ]
Dam [ ] Stream [ ] Municipal tap [ ]

C2. Mark which were provided by USAID-funded intervention
RWH [ ] Other tank [ ] Borehole [ ] Protected Well [ ]

C3. Mark the sources most used by the school in the DRY season (April – October)
RWH [ ] Other tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ]
Dam [ ] Stream [ ] municipal tap [ ]

C4. Mark the sources most used by the school in the RAINY season (November – March)
RWH [ ] Other tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ]
Dam [ ] Stream [ ] municipal tap [ ]

C5. How much time does a round trip to each of these sources take, including waiting
Tank _________ (minutes)
Borehole _________ (minutes)
Protected Well _ _________ (minutes)
Unprotected Well _________(minutes)
River _________(minutes)
Dam _________(minutes)

The following questions are regarding USAID-funded RWH interventions ONLY

C6: When was the RWH system constructed? ________________________________

D2. Do you have soap available for handwashing? YES [ ] NO [ ]

D3. If YES, can we see the soap? Soap observed? [ ] Soap not observed [ ]

RAINWATER HARVESTING SYSTEMS - OBSERVATION CHECKLIST

TECHNICAL OBSERVATIONS

1. Type of tank:
   Brick/cement [ ] Ferrocement [ ] Galvanized iron [ ] PVC [ ] Other____
2. Size of tank _______________ cubic meters [other units_______________]
3. Estimated quantity/volume of water currently available in tank _______________ cubic meters [other units_______________]
4. Water quality sample taken? YES [ ] NO [ ] ID_____________________
5. Presence of vector control? YES [ ] NO [ ]
   Lids [ ] Screens [ ] Larvacide [ ] Other _________
6. Presence of mosquitoes or larvae in or around the RWH YES [ ] NO [ ]
7. Operational status of water supply system:
   Fully functional [ ] Functioning with some problems [ ] Not operational [ ]

If not fully functional, describe observed problems

---

8. Is there any evidence of leaks? YES [ ] NO [ ]
9. Are the gutters connected? YES [ ] NO [ ]
10. If the gutters are not connected, what is the reason?_______________________________________
11. What material is the roof?

Corrugated iron [ ] Asbestos [ ] Tiles [ ]
Other________________________________

12. Is the roof pitched [ ] or flat [ ]
13. Estimated catchment area (area of the roof)?
14. Is the area around the tank clean YES [ ] NO [ ]

If no, describe:____

OTHER OBSERVATIONS

15. Is there any other source of water connected to the RWH tank? YES [ ] NO [ ]

Describe____

16. Evidence of agricultural activities using intervention water sources in dry season. YES [ ] NO [ ]

Describe____

17. Evidence the RWH activities have been replicated? YES [ ] NO [ ]

Describe ____

18. Does design appear to be replicable by community members? YES [ ] NO [ ]

Describe____

List any photographs taken here:

ZIMBABWE WATER INFRASTRUCTURE EVALUATION
CONFIDENTIAL INFORMATION

QUESTIONNAIRE CODE NUMBER				

SCHOOL SURVEY

DATE OF INTERVIEW: ______________________ **SEASON** DRY [ ] RAIN [X]

ENUMERATOR NAME:______________________**Implementing Organization:**_______________

Province: _________________________ **District:**______________________________

City/Ward Name:______________________ **Village/ Suburb Name**:______________________

School name: ____

Address / GPS Coordinates____

Name of Respondent:________________________ **Sex** M [ ] F[ ]

SECTION A: School Information

A1: How many students are enrolled? _______________

A2: Approximate percentage of girls?_____________

A3: Approximate percentage of boys?_________________

SECTION B: Costs

SECTION C: Water Supply

C1: Which of the following water sources does the school use?

RWH [ ] Other tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ]
Dam [ ] Stream [ ] Municipal tap [ ]

C4. Mark the sources most used by the school in the RAINY season (November – March)
RWH [ ] Other tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ]
Dam [ ] Stream [ ] municipal tap [ ]

The following questions are regarding USAID-funded RWH interventions ONLY

C7: How do you rank water supply from the RWH System? [ ]
1 = Very Poor 2 = Poor 3 = Good 4 = Very Good 5 = Excellent
C9: When was the system last maintained?..
C10: During maintenance, what did they do? ____
C11: List the benefits brought by the RWH System
1:...
2:...
3:...
4:...
5:...
C12: How many times has the RWH system broken down since it was constructed? [ ]

C14: When the RWH system is operational, how often do you collect water for the school? [ ]
1 = once per day 2 = twice per day 3 =three times per day 4 = once / week 5 = two times / week

C15: How many tanks does the school have?____
C15b: How many of the tanks are not functioning? ____

C15: How much water do you collect from the RWH System per day? [ ] litres

Page **1** of **2**

ZIMBABWE WATER INFRASTRUCTURE EVALUATION
CONFIDENTIAL INFORMATION

QUESTIONNAIRE CODE NUMBER				

RAINWATER HARVESTING SYSTEMS – HOUSEHOLD SURVEY

DATE OF INTERVIEW: ___________________________ SEASON DRY [ ] RAIN [ ]

ENUMERATOR NAME:_______________________________________

Implementing Organization:_____________ Project Identification/Name: ____________________

Province: ___________________________District:_________________________________

City/Ward Name:______________________ Village/ Suburb Name:_______________

ADDRESS AND/OR GPS COORDINATES:____

Name of Respondent (optional):________________________ Sex M [ ] F[ ]

SECTION A: **Household (HH) Information**

A1: How many people are in the household? (HH Size) ___________________

A2: How many people are women? _____________

A3: Is the head of household male or female? M [ ] F[ ]

A4: Age range of the head of household? [ ]

CODE 1 = 1-18 2 = 19-60 3 = 60 - up

A5: Did any household member experience episodes of diarrhea last week?
YES [ ] NO [ ]

A6: Did any household member suffer from cholera between 2009 and now?
YES [ ] NO [ ]

SECTION B: **Household Economy**

B1: What is the main source of income of the household head?
____

B2: What is the total income of the household per month? US$[ ]

1 = <US$$5 2=US$6-10 3=US$11-15 4=US$16-20 5=US$21-30 6=US$31-50 7=US$51-100
8=>US$100

B3: What is the main source of livelihood for the household – (how do you survive)
____

B4: How much do you spend on household water per months? US$[ ]

SECTION C: **Water Supply**

C1: Which of the following water sources does the household use?

RWH [ ] Other tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ]
Dam [ ] Stream [ ] Household Tap (municipal) [ ]

C2. Mark which were provided by USAID-funded intervention

RWH [ ] Other tank [ ] Borehole [ ] Protected Well [ ]

C3. Mark the sources most used by the Household in the DRY season (April – October)

RWH [ ] Other tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ]
Dam [ ] Stream [ ] Household Tap (municipal) [ ]

C4. Mark the sources most used by the Household in the RAINY season (November – March)

RWH [ ] Other tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ]
Dam [ ] Stream [ ] Household Tap (municipal) [ ]

C5. How much time does a round trip to each of these sources take, including waiting

Tank _______ (minutes)
Borehole _______ (minutes)
Protected Well _ _______ (minutes)
Unprotected Well _______(minutes)
River _______(minutes)
Dam _______(minutes)
Stream _______(minutes)

The following questions are regarding USAID-funded RWH interventions ONLY

C6: When was the RWH system constructed? ___________________________________

C7: How do you rank water supply from the RWH System? [ ]
1 = Very Poor 2 = Poor 3 = Good 4 = Very Good 5 = Excellent

C8: Who is responsible for maintaining and repairing the RWH System?
____

C9: When was the system last maintained? ....

C10: During maintenance, what did they do?

____

C11: List the benefits brought by the RWH System
1: ....
2: ....
3: ....
4: ....
5: ....

C12: How many times has the RWH system broken down since it was constructed? [ ]

C13: Who is responsible for fetching water in the household? [ ]
CODE 1 = boys 2 = Girls 3 = Women 4 = Men

C14: When the RWH system is operational, how often do you collect water for the household?
[ ]
CODE 1 = once per day 2 = twice per day 3 =three times per day
4 = once per week 5 = two times per week

C15: How much water do you collect from the RWH System per day? [ ] litres

C17: What do you use water fetched from the RWH System for?
1. ____
2. ____
3. ____
4. ____
5. ____

C18: Is water fetched from the RWH System enough to meet your needs?
YES [ ] NO [ ]

C19: Is there water in the tank now? YES [ ] NO [ ]

C20: If no, when did the tank go dry?

C21: Last year, how long did water from the RWH System last into the dry season? [ ] Months

C22: How many people use water from this RWH tank? ___________

C23: How do you rank the quality of RWH water? [ ]
CODE 1 = Very Poor 2 = Poor 3 = Good 4 = Very Good 5 = Excellent
C24: Is water from RWH odorless? (does it have a smell?) YES [ ] No [ ]
C25: Is water from RWH colorless? (no suspended or dissolved material) YES [ ] No [ ]
C26: Does water from RWH taste good? YES [ ] No [ ]

C27: If household does NOT have RWH system, are you willing to construct your own?
YES [ ] NO [ ]
C27a: Do you know how much it costs to build a RWH System? US$[ ]
C27b: Where would you get the necessary materials to build the System?
____

C28: If the answer to Question 27 above is NO, what are your reasons?
1. ____
2. ____
3. ____
4. ____

C29: Are there any problems with water supply from the Rainwater Harvesting System?
1. ____
2. ____
3. ____
4. ____

C30: What can be done to improve water supply from the Rainwater Harvesting System?
1: ....
2: ....
3: ....
4: ....

SECTION D: **Sanitation & Hygiene**

D1: What type of toilet is used by the household? [ ]

1 = Bush
2= Unimproved pit latrine
3= Improved pit latrine
4= Ventilated Improved Pit Latrine
5 = Public Flush Latrine
6= Flush toilet inside the house
7 = Other Specify________________________________

D2. Do you have soap available for handwashing? YES [ ] NO [ ]

D3. If YES, can we see the soap? Soap observed? [ ] Soap not observed [ ]

Thank you for your contribution and cooperation

ZIMBABWE WATER INFRASTRUCTURE EVALUATION

CONFIDENTIAL INFORMATION

QUESTIONNAIRE CODE NUMBER				

RAINWATER HARVESTING SYSTEM OBSERVATION CHECKLIST

DATE OF OBSERVATION: ___________________________ SEASON DRY [ ] RAIN [ ]

ENUMERATOR NAME:____

PROJECT IDENTIFICATION/NAME: ____

IMPLEMENTING ORGANIZATION:____

PROVINCE: _____________________DISTRICT:________________________________

CITY/WARD NAME:______________________ VILLAGE/ SUBURB NAME:_______________

HOUSEHOLD [ ] SCHOOL [ ] CLINIC [ ] DATE TANK INSTALLED (IF KNOWN)_______________

CONTACT PERSON:____________________________________ (LINKED SURVEY CODE:___________)

GPS COORDINATES/ADDRESS: ____

TECHNICAL OBSERVATIONS

1. Type of tank: Brick/cement [ ] Ferrocement [ ] Galvanized iron [ ] PVC [ ] Other________
2. Size of tank _______________ cubic meters [other units_______________]
3. Estimated quantity/volume of water currently available in tank _______________ cubic meters [other units_______________]
4. Water quality sample taken? YES [ ] NO [ ] ID_________________________________
5. Presence of vector control? YES [ ] NO [ ]
   Lids [ ] Screens [ ] Larvacide [ ] Other ____________________________
6. Presence of mosquitoes or larvae in or around the RWH YES [ ] NO [}
7. Operational status of water supply system:
   Fully functional [ ] Functioning with some problems [ ] Not operational [ ]

If not fully functional, describe observed problems___________________________________

____

8. Is there any evidence of leaks? YES [ ] NO [ ]
9. Are the gutters connected? YES [ ] NO [ ]
10. If the gutters are not connected, what is the reason?_______________________________
11. What material is the roof?

Corrugated iron [ ] Asbestos [ ] Tiles [ ] Other______________________________

12. Is the roof pitched [ ] or flat [ ]
13. Estimated catchment area (area of the roof)? ___________________________________
14. Is the area around the tank clean YES [ ] NO [ ] If no, describe: ______________________

OTHER OBSERVATIONS

15. Is there any other source of water connected to the RWH tank? YES [ ] NO [ ]

Describe____

16. Evidence of agricultural activities using intervention water sources in dry season. YES [ ] NO [ ]

Describe____

17. Evidence the RWH activities have been replicated? YES [ ] NO [ ]

Describe ____

18. Does design appear to be replicable by community members? YES [ ] NO [ ]

Describe____

List any photographs taken here:

ZIMBABWE WATER INFRASTRUCTURE EVALUATION

CONFIDENTIAL INFORMATION

QUESTIONNAIRE CODE NUMBER				

RAINWATER HARVESTING SYSTEM OBSERVATION CHECKLIST

DATE OF OBSERVATION: ______________________________ SEASON DRY [ ] RAIN [X]

ENUMERATOR NAME:____

PROJECT IDENTIFICATION/NAME: ____

IMPLEMENTING ORGANIZATION:____

PROVINCE: ________________________DISTRICT:____________________________________

CITY/WARD NAME:_________________________ VILLAGE/ SUBURB NAME:________________

HOUSEHOLD [ ] SCHOOL [ ] CLINIC [ ] DATE TANK INSTALLED (IF KNOWN)________________

CONTACT PERSON:____ (LINKED SURVEY CODE:____________)

GPS COORDINATES/ADDRESS: ____

TECHNICAL OBSERVATIONS

1. Estimated quantity/volume of water currently available in tank ________________ cubic meters [other units________________]
2. Water quality sample taken? YES [ ] NO [ ] ID___________________________________
3. Presence of vector control? YES [ ] NO [ ]
   Lids [ ] Screens [ ] Larvacide [ ] Other ________________________________
4. Presence of mosquitoes or larvae in or around the RWH YES [ ] NO [}
5. Operational status of water supply system:
   Fully functional [ ] Functioning with some problems [ ] Not operational [ ]

If not fully functional, describe observed problems____

____

6. Is there any evidence of leaks? YES [ ] NO [ ]
7. Are the gutters connected? YES [ ] NO [ ]
8. If the gutters are not connected, what is the reason?____________________________________
9. Is the area around the tank clean YES [ ] NO [ ] If no, describe: ______________________

OTHER OBSERVATIONS

10. Is there any other source of water connected to the RWH tank? YES [ ] NO [ ]

Describe____

List any photographs taken here:

ZIMBABWE WATER INFRASTRUCTURE EVALUATION
CONFIDENTIAL INFORMATION

QUESTIONNAIRE CODE NUMBER				

OTHER WATER SYSTEMS – HOUSEHOLD SURVEY

DATE OF INTERVIEW: ___________________________ SEASON DRY [ ] RAIN [ ]
ENUMERATOR NAME:_______________________________________
Project Identification/Name: _______________Implementing Organization:_________________
Province: _________________________ District:_________________________________
City/Ward Name:_____________________ Village/ Suburb Name:_______________
ADDRESS AND/OR GPS COORDINATES:____
Name of Respondent (optional):_________________________ Sex M [ ] F[ ]
Type of system:

SECTION A: Household (HH) Information

A1: How many people are in the household? (HH Size) ___________________
A2: How many people are women? _____________
A3: Is the head of household male or female? M [ ] F[ ]
A4: Age range of the head of household? 1. 1-18 2. 19-60 3. 60 - up
A5: Did any household member experience episodes of diarrhea last week? YES / NO
A6: Did any household member suffer from cholera between 2009 and now? YES / NO

SECTION B: Household Economy

B1: What is the main source of income?_________________________________
B2: What is the total income of the household per month? 1 = <US$$5 2=US$6-10 3=US$11-15 4=US$16-20 5=US$21-30 6=US$31-50 7=US$51-100 8=>US$100
B3: How much do you spend on household water per months? US$[ ]

SECTION C: Water Supply

C1: Which of the following water sources are used by the household?
RWH [ ] Tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ] Dam [ ] Stream [ ] Household Tap (municipal) [ ]

C2. Mark which were provided by USAID-funded intervention
RWH [ ] Tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ] Dam [ ] Stream [ ] Household Tap (municipal) [ ]

C3. Mark the sources most used by the Household in the dry season
RWH [ ] Tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ] Dam [ ] Stream [ ] Household Tap (municipal) [ ]

C4. Mark the sources most used by the Household in the rainy season
RWH [ ] Tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ] Dam [ ] Stream [ ] Household Tap (municipal) [ ]

C5. How much time does a round trip to each of these sources take, including waiting
RWH _______ (minutes)
Tank _______ (minutes)
Borehole _______ (minutes)
Protected Well _ _______ (minutes)
Unprotected Well _______(minutes)
River _______(minutes)
Dam _______(minutes)
Stream _______(minutes)
Household _______(minutes)
Tap (municipal) _______(minutes)

Page **1** of **2**

The following questions are regarding USAID-funded water interventions ONLY

C6: How do you rank water supply from the water system? [ ]
CODE 1 = Very Poor 2 = Poor 3 = Good 4 = Very Good 5 = Excellent
C7: List the benefits brought by the water system
....
C8: Who is responsible for maintaining and repairing the water system?
____
C9: How many times has the water system broken down since it was constructed? [ ]
C10: Who is responsible for fetching water in the household?
1 = boys 2 = Girls 3 = Women 4 = Men
C11: When the water system is operational, how often do you collect water for the household?
1 = once per day 2 = twice per day 3 =three times per day 4 = once per week 5 = two times per week
C12: How much water do you collect from the Water system per day? [ ] litres
C13: What do you use water fetched from the Water system for?
____
C14: Is water fetched from the Water system enough to meet your needs?
YES [ ] NO [ ]
C15: How do you rank the quality of water from the system? [ ]
CODE 1 = Very Poor 2 = Poor 3 = Good 4 = Very Good 5 = Excellent
C16: Are there any problems with water supply from the system?
____
C17: What can be done to improve water supply from the system?
....
C18: Are you willing to construct your own household Rainwater Harvesting tank? Yes/No
C19: Do you know how much it costs to build a RWH System? US$[ ]
C20: Where would you get the necessary materials to build the System?
____
C21: If the answer to Question 23 above is NO, what are your reasons?
____

SECTION D: Sanitation & Hygiene

D1: What type of toilet is used by the household?
1 = Bush
2= Unimproved pit latrine
3= Improved pit latrine
4= Ventilated Improved Pit Latrine
5 = Public Flush Latrine
6= Flush toilet inside the house
7 = Other Specify_______________________________________
D2. Do you have soap available for handwashing? YES [ ] NO [ ]
D3. Can we see the soap? Soap observed? [ ] Soap not observed [ ]

Section E: Technical Observations

E1: Type of system:
E2: Operational status of water supply system:
Fully functional [ ] Functioning with some problems [ ] Not operational [ ]
If not fully functional, describe observed problems
____
E3: If a well, is the area around it protected?

List any photographs taken here:

ZIMBABWE WATER INFRASTRUCTURE EVALUATION
CONFIDENTIAL INFORMATION

QUESTIONNAIRE CODE NUMBER				

OTHER WATER SYSTEMS – HOUSEHOLD SURVEY

DATE OF INTERVIEW: ___________________________ SEASON DRY [ ] RAIN [ ]
ENUMERATOR NAME:_______________________________________
Project Identification/Name: _______________Implementing Organization:_________________
Province: _________________________ District:_______________________________
City/Ward Name:______________________ Village/ Suburb Name:_______________
ADDRESS AND/OR GPS COORDINATES:____
Name of Respondent (optional):_________________________ Sex M [ ] F[ ]
Type of system:

SECTION A: Household (HH) Information

A1: How many people are in the household? (HH Size) ___________________
A2: How many people are women? _____________
A3: Is the head of household male or female? M [ ] F[ ]
A4: Age range of the head of household? 1. 1-18 2. 19-60 3. 60 - up
A5: Did any household member experience episodes of diarrhea last week? YES / NO
A6: Did any household member suffer from cholera between 2009 and now? YES / NO

C4. Mark the sources most used by the Household in the rainy season
RWH [ ] Tank [ ] Borehole [ ] Protected Well [ ] Unprotected Well [ ] River [ ] Dam [ ]
Stream [ ] Household Tap (municipal) [ ]

The following questions are regarding USAID-funded water interventions ONLY

C6: How do you rank water supply from the water system? [ ]
CODE 1 = Very Poor 2 = Poor 3 = Good 4 = Very Good 5 = Excellent
C9: How many times has the water system broken down since it was constructed? [ ]
C10: Who is responsible for fetching water in the household?
1 = boys 2 = Girls 3 = Women 4 = Men
C11: When the water system is operational, how often do you collect water for the household?
1 = once per day 2 = twice per day 3 =three times per day 4 = once per week 5 = two times per week
C12: How much water do you collect from the Water system per day? [ ] litres
C13: What do you use water fetched from the Water system for?
____
C14: Is water fetched from the Water system enough to meet your needs?
YES [ ] NO [ ]
C15: How do you rank the quality of water from the system? [ ]
CODE 1 = Very Poor 2 = Poor 3 = Good 4 = Very Good 5 = Excellent
C16: Are there any problems with water supply from the system?
____
C17: What can be done to improve water supply from the system?
....

D2. Do you have soap available for handwashing? YES [ ] NO [ ]
D3. Can we see the soap? Soap observed? [ ] Soap not observed [ ]
If you don't have soap, why not?

Section E: Technical Observations

E1: Type of system:
E2: Operational status of water supply system:
Fully functional [ ] Functioning with some problems [ ] Not operational [ ]
If not fully functional, describe observed problems
____
E3: If a well, is the area around it protected?
List any photographs taken here:

Page **1** of **1**

ANNEX IV: SOURCES OF INFORMATION

Sources of information include key informants, project proposals, project reports, and other information as listed below.

Key Informants Interviewed
Organization: CONCERN Zimbabwe
Project: Cholera Response Programme
Respondent: Mark Harper (Country Director)
SI Team members: David Bonnardeaux, Roy Mutandwa
Date: August 9, 2013

Organization: GOAL Zimbabwe
Project: Emergency Cholera Intervention in Zimbabwe
Respondent: Joseph Kamuzhanje (Assistant Country Director; Programmes); Farayi [last name not captured] (M&E Officer), and Kelly McAulay (Country Director)
SI Team members: David Bonnardeaux, Roy Mutandwa
Date: July 22, 2013

Organization: GOAL Zimbabwe
Project: Emergency Cholera Intervention in Zimbabwe
Respondent: Jo Ryan (Regional Director)
SI Team members: David Bonnardeaux, Roy Mutandwa
Date: Thursday, August 8

Organization: Harare City Council – Water Department
Respondent: Engineer Sango- Distribution and Customer Manager
SI Team Members: Roy Mutandwa and Jaison Chireshe
Date: July 16, 2013

Organization: IMC
Project: Program to Reduce Mortality and Morbidity due to Cholera in Three Rural Districts; Promoting Improved Hygiene and Sanitation Through CLTS
Respondent: Alfred Mushonga
SI Team members: David Bonnardeaux, Roy Mutandwa
Date: July 24, 2013

Organization: Institute of Water and Sanitation Development (IWSD)
Key Informant:: Remembrance Mashava, Executive Director
SI Team members: Roy Mutandwa and Jaison Chireshe
Date: July 15, 2013

Organization: Manicaland Provincial Water and Sanitation Sub-Committee (PWSSC)
Respondent: Mr Museka, PWSSC Chairman; Mr Chinyoma, DDF Provincial Head
Others present: Collen Shoko (Mercy Corps), Saidi Mpota (IRC)
SI Team members: David Bonnardeaux, Roy Mutandwa
Date: Aug, 26 2013

Organization: National Coordination Unit (NCU)
Key Informant: N Shirihuru (Rural WASH OFFICER) and Mr Dobha (WASH Information Officer)

SI Team Members: Roy Mutandwa and Jaison Chireshe
Date: July 15, 2013

Organization: Oxfam GB
Project: Public Health Program For Urban Humanitarian Crisis
Respondent: Alford Garikai
SI Team member: David Bonnardeaux
Date: July 17, 2013

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ANNEX V: DISCLOSURE OF ANY CONFLICTS OF INTEREST

Name	David Bonnardeaux
Title	Project Evaluations Specialist
Organization	MSI
Evaluation Position?	☐ Team Leader ☒ Team member
Evaluation Award Number *(contract or other instrument)*	SOL-OAA-13-000025
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Zimbabwe Water Infrastructure Evaluation for DCHA/OFDA, Social Impact and Management Systems International
I have real or potential conflicts of interest to disclose.	☐ Yes ☒ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* *1. Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* *2. Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* *3. Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* *4. Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* *5. Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* *6. Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	

I certify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this disclosure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, then I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and refrain from using the information for any purpose other than that for which it was furnished.

Signature	
Date	2/10/14

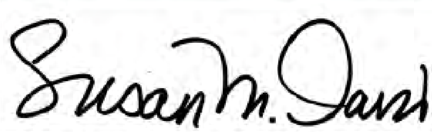
Name	Chireshe Jaison
Title	National Project Evaluation Specialist
Organization	Management Systems International (MSI)
Evaluation Position?	☐ Team Leader ☒ Team member
Evaluation Award Number *(contract or other instrument)*	
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Zimbabwe WASH Infrastructure Project Evaluation
I have real or potential conflicts of interest to disclose.	☐ Yes ☒ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* *1. Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* *2. Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* *3. Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* *4. Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* *5. Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* *6. Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	

I certify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this disclosure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, then I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and refrain from using the information for any purpose other than that for which it was furnished.

Signature	
Date	11 February 2014

Name	Susan Davis
Title	Evaluation Methods Specialist & Team Leader
Organization	Social Impact
Evaluation Position?	■ Team Leader ☐ Team member
Evaluation Award Number *(contract or other instrument)*	AID-OAA-TO-13-00024
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	USAID-OFDA funded WASH projects in Zimbabwe
I have real or potential conflicts of interest to disclose.	■ Yes ☐ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* *1. Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* *2. Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* *3. Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* *4. Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* *5. Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* *6. Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	Potential conflicts of interest related to #5: Formerly worked with WaterPartners International, CARE, and Water For People

I certify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this disclosure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, then I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and refrain from using the information for any purpose other than that for which it was furnished.

Signature	
Date	2-11-14

Name	Roy Mutandwa
Title	National Evaluation Project Specialist
Organization	Social Impact
Evaluation Position?	☐ Team Leader ☑ Team member
Evaluation Award Number *(contract or other instrument)*	
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Zimbabwe Water Infrastructure Evaluation
I have real or potential conflicts of interest to disclose.	☐ Yes ☑ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* *1. Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* *2. Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* *3. Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* *4. Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* *5. Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* *6. Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	

I certify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this disclosure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, then I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and refrain from using the information for any purpose other than that for which it was furnished.

Signature	
Date	10/02/2014

Name	Nyasha Lawrence Nyagwambo
Title	Dr.
Organization	Social Impact
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	AID-RAN-I-00-09-00019
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Zimbabwe Water Infrastructure Evaluation
I have real or potential conflicts of interest to disclose.	☐ Yes ■ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* *1. Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* *2. Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* *3. Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* *4. Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* *5. Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* *6. Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	

I certify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this disclosure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, then I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and refrain from using the information for any purpose other than that for which it was furnished.

Signature	
Date	12 FEBRUARY 2014

ANNEX VI: USAID/OFDA–FUNDED PROGRAMS IN ZIMBABWE

Partner/ Year	Project Title/Award #	Location	Technology	Risk Mitigation and Misc. info.
ADRA 2010	ADRA Water and Hygiene Promotion Project/ AID-OFDA-G-10-00038	Midlands Province Gokwe North District (3) Wards 8,9, 33	Corrugated metal sheets, gutter systems, downspouts, and 5,000 liter galvanized steel rainwater catchment system in 64 households and 5 schools.	Goal: Reduce morbidity and mortality associated with water and sanitation related diseases. Precip. Levels uneven through year but significant from Sept.-April to warrant this approach. Infrastructure provided, along with training and maintenance manuals intended to leave systems in long term operation.
ADRA 2011	ADRA Water and Hygiene Promotion Project Phase II/ AID-OFDA-G-11-00154	Midlands Province Gokwe North District (6) Wards 8,9,11,12,13,33	Corrugated metal sheets, gutter systems, downspouts, and 50 larger cost effective 10,000 liter ferrocement tanks. Each tank will supply a total of 20 households for 25 days. Five schools will each receive two of these tanks.	Goal: Reduce morbidity and mortality associated with water and sanitation related diseases. Precip. Levels uneven through year but significant from Sept.-April to warrant this approach. Infrastructure provided, along with training and maintenance manuals intended to leave systems in long term operation.

Concern 2009	Cholera Emergency WASH Program/ DFD-G-00-09-00105-00	1)Mashonaland West - Chegutu District 2)Midlands- Gokwe North District,Gokwe South District 3) Manicaland-Nyanga District	Two handpumps rehabilitated in Chegutu town. In rural areas, 19 broken handpumps rehabilitated (3 Gokwe North, 16 Nyanga). Facilitated drilling and installation of 18 new boreholes by UNICEF. Rehabilitation to broken sewer lines in Chegutu urban area and construction of new latrines in ward 12.	N/A
GOAL 2009	Emergency Cholera Intervention in Zimbabwe/ DFD-G-00-09-00062-00	1)Harare- Dzivarasekwa and Hatcliffe Districts 2) Manicaland-Makoni District 3) Mashonaland West- Hurungwe District 4)Mashonaland Central-Mount Darwin and Guruve Districts	At the request of OFDA the provision of 9 boreholes was removed from the original proposal. Upgrade of sewage line.	N/A
IMC 2009	WASH Mitigation and Cholera Response/ DFD-G-00-09-00323-00	Mashonaland Central Province-Bindura, Rushinga, and Shamva Districts	Using simple rope and washer and elephant pumps to protect household wells or mobilize households to dig new wells with proper sealing and delivering systems. Biosand filters to 120 households.	N/A
IOM 2009	Up-scaled Cholera Outbreak Response For Migrants and Mobile and Vulnerable Population Settings/DFD-G-00-09-00065-00	Main Border Areas and MVP Communities Nationwide	Decontamination of damaged water and sanitation facilities: Treatment and protection of wells.	N/A

IRC 2010	WASH-Focused Disaster Risk Reduction Initiative in Manicaland Province /AID-OFDA-G-10-00006	Manicaland Province -Mutare, Mutasa, and Nyanga Districts	Rehabilitation of deep and shallow wells. Construct rainwater harvesting systems in 30 schools.	This will help mitigate risks of outbreaks of water borne disease. Rains are seasonal and occur mainly during summer months (November-March).
IRD 2009	Peri-urban ROOFtop Rain Water Harvesting in Zimbabwe/ DFD-G-00-09-00202-00	Harare Province- Harare Municipality (Suburbs: Glenview, Budiriro, Mbare, Mabvuku, Tafara); Chitungwiza Municipality (Suburb Seke: Units O, G and P)	Rainwater harvesting systems installed at 450 households (10,000 liter tanks) and 44 at five schools (30,000 liter tanks). Galvanized iron gutters and tanks.	A cholera emergency response solution, a solution for the medium-term prevention of wtaer-borne diseases, and a sufficient on-site water storage capacity to provide drinking water year-round through the dry season (April to September).
IRD 2010	Peri-urban ROOFtop Rain Water Harvesting in Zimbabwe II/ AID-OFDA-G-10-00056	Municipality of Harare: Mabvuku and Tafara; Municipality of Chitungwiza: Seke Units O, P, and G; Municipality of Mutare: Dangamvura Buhera District	Rainwater harvesting systems installed at 355 households and 28 systems at 3 schools. Corrugated iron tanks except in the rural district of Buhera where ferrocement was used for tanks.	A cholera emergency response solution, a solution for the medium-term prevention of wtaer-borne diseases, and a sufficient on-site water storage capacity to provide drinking water year-round through the dry season (April to September).
IRD 2012	ZIMbabwe ROOFtop rainwater harvesting (ZIMROOF)/ AID-OFDA-G-12-00052	Manicaland Province-Mutare, Chipinge, Buhera, and Chimanimani Districts. A list of school names, ward numbers and GPS coordinates can be found in the Feb - March 2012 Quarterly Activity Report.	Rainwater harvesting systems installed in 20 schools (5 in each district). The tanks are ferro-cement, and gutters are galvanized steel.	Promotes RWH as a year-round drinking water solution for all target beneficiaries and as an emergency solution for communities affected by wtaer-borne diseases during the rainy season.

Medair 2011	Rural Water Supply and Treatment Infrastructure and Hygiene Promotion in Gokwe North District, Zimbabwe	Midlands Province, Gokwe North District- Goredema (Ward 10), Gwebo (Ward 35), Chireya 1 (Ward 4), Chireya 2 (Ward 8), Chireya 3 (Wards 9 and 34), Madzivazvido South (Ward 3), Madzivazvido (Ward 28), Mhuma (Ward 36), Kahobo (Ward 33)	Construction of new shallow hand-dug wells protected and fitted with hand pumps as well as the rehabilitation of 20 existing protected wells. Construction of 30 rainwater harvesting tanks in schools. Three 30,000 liter tanks provided to each of 10 schools in 7 wards. The tanks will be corrugated steel on a reinforced concrete base, with a bitumen liner.	Reduce the risk of water-borne disease arising from the use of unprotected surface and shallow water sources among rural populations, through sustained improvements in quantity and quality of water consumed at household levels in 10 wards and schools in 7 of the 10 wards. Each child will be provided 3 liters/ day for 77% of the year.
Medair 2012	Rainwater Harvesting Systems complimented by Hygiene Promotion in schools in the drought-prone Districts of Bulilima and Mangwe, Matabeleland South, Zimbabwe/ AID-OFDA-G-12-00175	Matabeleland South Province-Bulilima District (Wards 1,7,10,11,12,13,14,15,18,19,21,22) and Mangwe Districts (Wards 3,4,5,6,7,8,9,10,11,16,17).	Provide(8) 10,000 liter tanks to each of 16 schools (128 total). Method of construction will be using JoJo PVC water storage tanks on a reinforced concrete base, and PVC guttering. Provide (72) 5,000 liter tanks to 12 clinics.	Reduce the risk of water-borne disease for those attending rural clinics and schools, which are most affected by water deficits in the drought-prone districts of Bulilima and Mangwe. Provide 3 liters/day per child for more than 80% of the year.

ANNEX VII: COMPARISON OF RESULTS FROM OTHER EVALUATIONS

This is a summary of results related to the evaluation questions from other evaluations and reports reviewed in the literature review. Empty cells in the table below indicate there was no information available for that particular issue area.

	Overall Performance and Impact	Efficiency	Coverage and Design	Sustainability	Gender Equality and Equity
OXFAM	- Water quality testing for 26 protected wells in Epworth in 2011 (see Annex IX): three of the samples (11%) tested positive for fecal coliform.	-	-	- Training of water point committees, pump minders, etc. - 60 tool kits provided to wards for maintenance of pumps.	- Shifted strategy to target more men. - Specific gender output indicators
ADRA	- 5 water quality tests showed general, water from RWH tanks was safe	-	-	-	- Women and children primary beneficiaries - Disaggregated by gender - No specific gender-related indicator
IRD	-	-	- Simulations to reach optimal tank volume. - Galvanized iron not locally available - School tank volumes enough for demand - HH tank volumes not enough.	- Training manual for schools includes systems for O&M. - Set up and training of school water point committees	- Gender-specific indicators - Maintained gender equity in RWH provision
Mercy Corps	-	-	-	- Custody of wells remained with communities - Training in maintenance of water points - Strengthening of Community Water Point Committees - Use of CLTS under JI	- Women central target group of JI program. - Disaggregated beneficiaries by gender. - No gender-specific output indicator - Including in implementation, water point committees,

				program	training on technical skills and entrepreneurship.
IRC	-	-	-	- Training to school staff, local builders in O&M of RWH tanks. - Established school hygiene clubs responsible for maintenance	- Targeted female heads of HH as more credible info.
GOAL	-	-	-	-	- Gender-specific indicator employed -
IMC	-	-	-	-	-
Concern	-	-	-	- Training for water point committees on pump maintenance. - Community to pay ward-based pump minders for repairs. - Spare parts to be provided on an ongoing basis after program end.	- Women and children main targets of community awareness work - Emphasized equal participation of men and women - No gender-related indicators
MedAir	-	-	-	- Community involvement in intervention, including training. - Schools supplied with maintenance manual for RWH systems - One year warranty certificate to schools from contractor to cover any post-project issues.	-

				- Water Point Committee training. -	

ANNEX VIII: EVALUATIONS OF PROGRAMS FUNDED BY OTHER DONORS

Date	Evaluation Type	Implementing Organization	Funder	Type of Intervention
2012	End of project	Deutsche Welthungerhilfe	European Commission on Humanitarian Aid and Civil Protection (ECHO)	Cholera response: WASH
2012	Performance	Unknown	Australian Aid	Cholera response: Water treatment, emergency pipe repairs
2011	Performance	ACF	EuropeAid	Water point (boreholes) and latrine construction.
2011	End term	UNICEF, Mvuramanzi Trust, Institute of Water and Sanitation Development and IRC.	European Development Fund, and Government of Zimbabwe	WASH for rural poor (boreholes etc.)
2006	Sustainability	World Vision (possibly)	Unknown	Rural water supply
2004	Performance	multiple	ECHO	WASH, boreholes
2001	Performance	Multiple national and state-level agencies	Japan International Cooperation Agency (JICA); Zimbabwe Government	Boreholes

ANNEX IX: EPWORTH WATER QUALITY DATA 2011[32]

Name of Water Point	Ward	Date completed	Well depth (m)	Color	Smell	Turbidity (NTU)	Free Chlorine (DPD No 1)	Volume Filtered (ml)	Fecal Coliform per 100ml
F. Maramba Well	3	7/14/2011	7.22	clear	odorless	< 5	0	100	0
S. Chinheya	3	7/14/2011	7.80		odorless		0	100	0
W. Jenje	1	7/13/2011	9.20	clear	odorless	< 5	0	100	0
P. Gondo	1	7/13/2011	10.95	clear	odorless	< 5	0	100	0
V. Nheta	1	7/13/2011	10.90	clear	odorless	< 5	0	100	0
M. Chidemo	1	7/13/2011	8.35	clear	odorless	< 5	0	100	0
P. Karonga	1	7/13/2011	11.18	clear	odorless	< 5	0	100	0
O. Mangwiro	1	7/13/2011	8.00	clear	odorless	< 5	0	100	0
J. Musona	1	7/13/2011	6.25	clear	odorless	< 5	0	100	0
P. Size	1	7/13/2011	8.20	clear	odorless	< 5	0	100	0
B. Muzurura	2	7/13/2011	9.10	clear	odorless	< 5	0	100	0
Mugadza	2	7/13/2011	10.72	clear	odorless	< 5	0	100	0
S. Mbundo	2	7/13/2011	8.40	clear	odorless	< 5	0	100	0
T. Kajamba	2	7/13/2011	8.45	clear	odorless	< 5	0	100	0
D. Chimera	2	7/13/2011	8.10	clear	odorless	< 5	0	100	0
Bundo	2	7/13/2011	3.70	clear	odorless	< 5	0	100	0
Mafuta	2	7/13/2011	10.40	clear	odorless	< 5	0	100	0
G. Makuchete	6	7/13/2011	10.80	milky	odorless	> 5	0	100	0
L. Chitsumba	3	7/14/2011	6.73		odorless		0	100	1
F. Mukaranyama	3	7/14/2011	5.58	clear	odorless	< 5	0	100	3
F. Dhonza	3	7/14/2011	3.30		odorless	< 5	0	100	0
A. Ndlovu	4	7/14/2011	13.39	clear	odorless	< 5	0	100	0

[32] Extracted from Excel spreadsheet "Epworth Upgraded Wells Database 2011" provided by Oxfam

Name of Water Point	Ward	Date completed	Well depth (m)	Color	Smell	Turbidity (NTU)	Free Chlorine (DPD No 1)	Volume Filtered (ml)	Fecal Coliform per 100ml
T. Saunyama	7	7/14/2011	13.40	clear	odorless	< 5	0	100	0
J. Mudimu	7	7/14/2011	13.24	clear	odorless	< 5	0	100	0
Masiye	3	6/9/2011	8.50		odorless	> 5	0	100	1
Zinyengere School	3	5/17/2011	9.60	clear	odorless	< 5	0	100	0

ANNEX X: COST OF HOUSEHOLD ITEMS IN ZIMBABWE

		Average Unit Cost (USD)[33]					
Description	Unit	Urban Shops (Supermarket)	High Density (Tuckshop)	Rural (General Dealer)	NGO supplied	Average	Remarks
Loaf of bread	Loaf	$1.00	$1.00	$1.00	n/a	$1.00	often "$1 for 2 at bakers" but community does not have access.
Mealie meal	5kg	$3.55	$4.00	$4.00	n/a	$3.85	price is controlled by government but local variations occur (also not popular in rural areas where grain for grinding is preferred)
Sugar	2kg	$1.90	$2.00	$2.50	n/a	$2.13	price is controlled by government but local variations occur
Vegetables	bundle	$1.00	$1.50	$0.50	n/a	$1.00	usually as smaller bundles compared to supermarket and own garden in rural areas
Cooking oil	2 liters	$3.70	$5.00	$4.00	n/a	$4.23	varies with brand but cheapest available normally used
Dried fish	500g	$4.40	$6.00	$5.00	n/a	$5.13	not a daily need but more frequently consumed when compared to meat
Bath soap	300g	$0.80	$1.00	$1.00	n/a	$0.93	seldom used for hand washing
Bar of Green Soap (laundry)	1kg	$1.30	$1.50	$2.00	free	$1.60	used as multi-purpose soap (including but not limited to handwashing)
WaterGuard (to	150ml	$0.65	$1.00	$1.00	free	$0.88	bottle cap (5ml treat 20l) but rarely used and

[33] These are average prices and therefore only indicative. There will be a lot of local variations based on location and easy of supply. Also Zimbabwe has no US coins so either the Rand equivalent is used or people simply round off to the nearest dollar (usually up).

treat 20l):							available mostly in urban shops
Tap[34]	No	$7.00	n/a	n/a	free	$7.00	excluding installation costs
Total for food items		$15.55	$19.50	$17.00		$17.35	
Total for non-food items		$9.75	$3.50	$4.00		$3.42	excluding the tap

[34] The costs of hardware are likely underestimated as often people have to travel far to acquire one and travel costs are not factored.

ANNEX XI: INDICATORS FOR GENDER ISSUES IN WATER AND SANITATION[35]

The below indicators from the World Bank are divided into two sections: indicators which can be used during project monitoring and those which can be used during project evaluation. Within each section indicators are subdivided into categories such as involvement, benefits and community management.

Monitoring

I. Involvement
   a. Budget
      i. percentage of funds earmarked for women and for men
      ii. percentage of funds distributed to women and to men

   b. Performance
      i. percentage of women and men participating in water and sanitation activities
      ii. percentage of female participation to total potential female participation
      iii. percentage of women among persons trained in
      iv. maintenance and repair (male/female ratio)
      v. health education, etc. (male/female ratio)
      vi. percentage of women in charge of operation, maintenance and repair of facilities (male/female ratio)

   c. Community development
      i. existence of village-level women's group(s), e.g., self-help groups, cooperatives, religious group
      ii. approximate percentage of women involved (of the total female population of the project area).
      iii. approximate percentage of men involved (of the total male population of the project area).
      iv. initiatives undertaken by women and men (separately and jointly). How successful are they?
      v. what is the socio-economic group of female participants?
      vi. training of women and men in:
         1. vocational training
         2. maintenance, operation, repair of the facilities
         3. leadership and management
         4. health education

II. Impact of the availability of water and sanitation on:
   a. women's and men's productive activities
   b. women's and men's leisure
   c. child mortality
   d. water-related diseases

[35] Source: World Bank http://go.worldbank.org/Z4PX775K60

e. women's and men's community participation

III. Improvement

a. Improvement in women's and men's knowledge about water, sanitation, personal hygiene, health, use of water
b. Improvement of skills: in self-organization within water groups; decision-making; maintaining water facilities; solving problems.
c. Improvement in attitudes and beliefs: more women brave enough to attend meetings, talk and make decisions; seek new information, bring new ideas, feel proud of achievements; suggest own evaluation criteria.

IV. Benefits

a. Do women use the increased water supply for any of these activities:
    i. income-generating (e.g., brewing beer)
    ii. clothes washing
    iii. processing food for home or market
    iv. irrigating gardens
    v. cultivating fish ponds
    vi. rearing of poultry or livestock
    vii. vending (e.g., providing water at bus stops or market)

b. Which activities provide income for women?
    i. List them

c. Which activities provided income for men?
    i. List them

d. Were the activities listed undertaken on the initiative of:
    i. community women and men individually
    ii. committees of women and men (specify)
    iii. outside organization (specify)
    iv. other (specify)

e. Do women use time saved for any of these activities:
    i. market production
    ii. trading
    iii. fruit gathering
    iv. agricultural labor
    v. sewing
    vi. other (specify)

f. Which of these activities produce income for women?
    i. List them

g. Were the activities listed above undertaken by the initiative of:
    i. village women individually
    ii. committees of women (specify)
    iii. outside organization
    iv. other

h. Do women and men collect or produce any inputs for the project such as:
    i. stones, gravel, sand for construction

ii. pump parts
iii. well pipes
iv. latrine slabs
v. water carrying and storage containers
vi. pottery basins for handwashing
vii. other (specify)

i. Has health-promoting behavior increased?
    i. If yes, describe.

Evaluation

I. Role of Women and Men in Evaluation

a. Women and men in the community can work with project staff to identify criteria for the evaluation, collect and record data, and review evaluation findings. With a stake in the outcome, they will be more motivated to ensure that necessary care is taken in selecting and collecting data. They will at the same time feel responsible for suggesting modifications themselves, based on the interpretation of the data gathered. Women and men can not only collect the survey data, but can also organize a workshop for analyzing the findings.

II. General Evaluation Issues

a. Does this project correspond to gender priorities as outlined in agency or government policy documents?
b. Were project objectives and indicators related to gender achieved? If not, why not? If yes, what were the factors most responsible for success?
c. Were systematic efforts made to endure that the project was gender sensitive? If so, what steps were taken and how well did they work? If systematize efforts were not undertaken, why not?
d. Have roles/responsibilities changed as a result of this project? If yes, in what way? How did the project contribute to these changes?
e. Has women's and men's access to, or control of, the following resources changed as a result of this project? In what way? How did the project contribute to the changes?
    ii. informal education/training
    iii. income
    iv. credit
    v. sanitation facilities
    vi. safe water
    vii. decision-making authority at national and local levels
    viii. health care
    ix. equipment/technology
    x. employment
    xi. labor
        1. their own
        2. others

V. Describe and analyze women's and men's participation in project design and implementation

VI. Was adequate training available to women and men to ensure absorption of new technologies/ideas?

VII. Which of the following groups of women were included as agents (A) or beneficiaries (B) of the project?

ANNEX XII: TEN "GOLDEN RULES" FOR A GENDER APPROACH IN DRINKING WATER AND SANITATION PROGRAMMES[36]

I. Tailor information to all audiences: Make sure that policies and strategies are in place in projects and programes to ensure that information flows freely and reaches all women and men concerned, including minority groups and the poorest, directly or through representation. Keep in mind that different groups use different channels and differ in literacy, language skills and areas of interest.

II. Gender and poverty analysis: Ensure that baseline information required to formulate water and sanitation services, programes and projects is gender specific. In other words, make sure that for every major demographic, socio-economic and cultural group, data are gathered, recorded and analyzed separately by sex. A gender focus is needed in every stage of the development process. One must always ask how a particular activity, decision or plan will affect men differently from women, and some women or men differently from other women and men. When planning it is important to include indicators for measuring these impacts on different groups based on the data collected for monitoring and evaluation purposes.

III. Designing and planning WASH programes: Ensure that people in communities can participate equally and have a say in the way that WASH programes, policies and strategies are design and planned. This means thinking about a number of different sectors within a society including women and men, poor and better off, younger and older, etc. Depending on the situation, this may require specific measures, time allocations and budgets to reach and include these groups (e.g. meetings with specific groups at their places of work, mapping exercises). Planners and managers should ensure, and collect evidence to show, that women and men (including the poorest) have been able to voice their interests, and that all groups have been involved in mutually agreed decisions about WASH services: type, design and facility location, and arrangements for local maintenance, management and financing.

IV. Organizations: Determine [e.g. through setting minimums in bylaws] that a proportion of members of planning and management organizations are women. Enable women and men from different groups to choose their own representatives on the basis of suitability for various tasks and the trust they place in them. For women and representatives of minority groups to participate equally, extra measures are needed, such as training and education. Promote the idea of women being chosen for financial positions. Help to establish locally agreed rules and procedures for representatives to account for their work regularly to those who have chosen them.

V. Hygiene education: Involve women and girls as planners, change agents and managers, not simply as passive audiences. However, avoid overburdening one group with responsibility for change. Develop hygiene programes especially for men to address their own responsibilities and practices as well as the gender relations that affect health and hygiene. Gender-blind hygiene promotion often gives women and girls more work, fails to address male control of resources and overlooks the fact that young women often cannot change the behavior of elders, or male relatives or go against the views of older female relatives on hygiene issues.

VI. Training and employment: Make sure that both sexes are trained for technical, managerial and hygiene tasks. Adapt training to the requirements of women (place, methods, and duration) and

[36] IRC, 2008: http://www.irc.nl/page/4395

minority groups. Achieve an equitable division in paid and unpaid jobs as well as jobs with a higher and lower prestige.

VII. Means for improvements: Ensure that credit, materials and skills for making water/sanitation/hygiene improvements are available to both women and men. Remember that access to water and sanitation is also a right for the poorest people in the community. Make sure that the means of improvement are also accessible for the poor and the sick. Link water and sanitation projects with livelihood approaches and financial programes (micro credits etc.).

VIII. Gender-sensitivity and skills: Support agency staff and management, as well as staff in training institutions, to carry out a participatory analysis of their own experiences and interests, so that they become aware of why gender is important, the benefits of practicing a gender approach in all aspects of their work, and are better able to help others to develop this awareness.

IX. Staffing: Employ staff of both sexes and different ages, as well as from different ethnic and socio-economic groups and equip them to deal with gender issues and for other tasks. A more balanced representation in staffing highlights diversity and equality in an organization and their benefits, and achieves a general improvement in performance by bringing in different competencies and perspectives, as needed in dynamic area such as water and sanitation.

X. Communication and accountability: Make sure appropriate channels are in place to have regularly two way communication between yourselves as leaders and managers, other stakeholders and the men and women who are end-users. Give an account of what decisions have been made and why. Communication can be either directly or through women's and men's representatives. However, local leaders do not necessarily (or may not be able to) represent the views of all members of their constituency. Also, be aware that not all channels are open to all community members.

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