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WATER SECURITY FOR RESILIENT ECONOMIC GROWTH & STABILITY (BE SECURE) PROJECT

FINAL REPORT



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WATER SECURITY FOR RESILIENT ECONOMIC GROWTH & STABILITY (BE SECURE) PROJECT

Submitted to:

USAID Philippines

Prepared by:

AECOM

DISCLAIMER:

The authors' views expressed in this document do not necessarily reflect the views of the United States Agency for International Development or the United States Government.



ACKNOWLEDGEMENTS

The Water Security for Resilient Economic Growth and Stability (Be Secure) Project improved the livelihoods and provided better access to cleaner water of thousands of beneficiaries throughout the Philippines. Through the tireless efforts of AECOM and USAID's efforts, millions of lives have been affected for the better, benefiting from increased access to water and sanitation services, resilient systems and supports for disaster risk reduction, and higher capacity for implementing further change in the face of climate extremes to come.

Our particular thanks go to the USAID/Philippines Contracting Office team, especially CORs Joanne Dulce and Dani Newcomb, for their unwavering support and guidance throughout the project. The flexibility, the adaptive management and genuine care for not only the beneficiaries but the Be Secure staff as well, allowed for an extremely successful four years.

Finally, we offer our heartfelt gratitude to all the partners, volunteers, staff and beneficiaries for their tireless efforts and contributions. Each individual effort and each single act have come together to constitute a formidable and sustainable impact on the lives of people living in the Philippines. From our senior advisors and team leaders to our administrative and operations staff, this truly was an impressive success from all sides.

This report details accomplishments, but it also analyzes the effort made, the funds expended and the strategies selected. In the end it is not just the numbers that tell the story of Be Secure's success, but the voices of the recipient communities, mayors, and beneficiaries, many of which we have shared in this report as well. In reviewing the activities and results of the project, this report aims to tell the success story of four years' tireless effort for the Filipino people. **Maraming salamat po.**

ACRONYMS

Be Secure	Water Security for Resilient Economic Growth and Stability (Be Secure) Project
CCA	Climate Change Adaptation
CDI	Cities Development Initiative
CDO	Cagayan de Oro
CDP	Comprehensive Development Plan
CDRRM	City Disaster Risk Reduction and Management
CENRO	City Environment and Natural Resources Officer
CLUP	Comprehensive Land Use Plan
COP-CC	Community of Practice on Climate Change
COWD	Cagayan de Oro City Water District
CPU	Central Philippine University
DILG	Department of the Interior and Local Government
DMA	District metering area
DOH	Department of Health
DPWH	Department of Public Works and Highways
DRR	Disaster Risk Reduction
DRRM	Disaster Risk Reduction and Management
DSWD	Department of Social Welfare and Development
DTI	Department of Trade and Industry
GIS	Geographic Information System
IRR	Implementing Rules and Regulations
ISAWAD	Isabela City Water District
LCCAP	Local Climate Change Action Plan
LDRRMP	Local Disaster Risk Reduction and Management Plan
LGU	Local Government Unit
LMWD	Leyte Metro Water District
LWUA	Local Water Utilities Administration
MCWD	Metro Cotabato Water District
MIWD	Metro Iloilo Water District
NCCDP	National Community-Driven Development Program
NCAR	National Center for Atmospheric Research
NEDA	National Economic and Development Authority
NRW	Non-Revenue Water
NSSMP	National Sewerage and Septage Management Program
NWRB	National Water Resources Board
O&M	Operations and Maintenance
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PAWD	Philippine Association of Water Districts
PPP	Public-Private Partnership
RWSSP	Rural Water Supply and Sanitation Program
STP	Sewage-Septage Treatment Plant
TWG	Technical Working Group
UPLB	University of the Philippines Los Baños
WDM	Water Demand Management
WRF	Weather Research and Forecasting
WSP	Water Service Provider
ZCWD	Zamboanga City Water District

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EXECUTIVE SUMMARY

CONTEXT

Water security is a major input to achieving economic growth in the rapidly growing Philippines. While nationally there is an abundance of resources, water scarcity is increasingly felt at the local level. Water quality is an increasingly serious problem, with degraded water quality affecting human and ecosystem health.

In addition to water security issues, the Philippines is vulnerable to natural disasters. Because of its geographic location, the Philippines is known to be one of the world's most disaster-prone countries and loses up to \$5 billion every year due to natural disasters. The Philippines is also vulnerable to extreme weather events such as drought and flooding, which can directly impact on quality and quantity of freshwater resources and affect overall long-term security.

PROJECT OVERVIEW

USAID's Water Security for Resilient Economic Growth and Stability (Be Secure) Project in the Philippines, awarded on July 8, 2013, has been a four-year activity that worked to promote good governance and build capacity for long-term water security, improve access to water and wastewater treatment services, and build more resilient communities. Be Secure focused on achieving two intermediate results (IRs):

1. Increased sustainable access to water supply and wastewater treatment services; and
2. Increased resilience to climate-related water stress and hydrological extremes.

Be Secure worked at the national level and in six geographic sites, namely the provinces of Iloilo, Leyte, Misamis Oriental, Maguindanao, Basilan, and the city of Zamboanga. During the first two years, the project also worked in Tuguegarao City on IR 2 activities. The cities of Iloilo, Cagayan de Oro (CDO in Misamis Oriental), and Zamboanga are USAID's Cities Development Initiative (CDI) partners where

several of its projects worked in synergy. Maguindanao, Basilan and Zamboanga are among conflict-affected areas in Mindanao prioritized by USAID for improving peace and stability.

At the national level, the project's activities supported initiatives to strengthen water sector governance and regulation. For local and regional activities, the project worked with LGUs and water service providers (WSPs) at the watershed scale to improve capacities for integrating climate change into local planning and the provision of water supply and wastewater treatment services. Be Secure closely coordinated with the Government of the Philippines, both national and local government units, and other key counterparts including water service providers (public and private) and nongovernmental organizations. Be Secure also worked in partnership with academic institutions as centers of excellence that can sustain project initiatives.

PROJECT RESULTS

Over the four-year life of Be Secure, the project met or exceeded 16 of its 17 performance indicators. Three of its major accomplishments are as follows:

- **Over 1.86 million Filipinos gained access to an improved drinking water source, including 909,097 people who live in conflict-affected areas in Mindanao.** About 1.19 million or 64% of the total access numbers were a result of Be Secure's engagement with and support for water districts to reduce non-revenue water in CDO, develop a public-private partnership in Iloilo, protect Tacloban City's main water source from erosion, and develop a small water system for Malamawi Island in Basilan. Be Secure also assisted LGUs to develop water systems funded by the programs of the Department of Interior and Local Government (DILG) as well as the Department of Social Welfare and Development for rural and waterless communities, which comprise 35 percent of the total number of people benefitting from water access. Through Be Secure's partnerships with public and private sectors, a total of \$83.9 million was mobilized to improve water and sanitation.
- **Over 1.04 million Filipinos gained access to an improved sanitation facility.** This result was enabled through Be Secure's technical assistance for the development of septage management programs in Isabela City in Basilan, Tacloban and Ormoc Cities in Leyte, Cotabato City and Zamboanga City. Be Secure assisted the LGUs in developing ordinances, selecting appropriate technology and site, preparing preliminary designs for septage treatment systems, conducting financial analysis, and implementing promotional campaigns. The project also helped organize exchange visits to Dumaguete City in Negros Occidental and Metro Manila as part of its overall initiative to build capacity of LGUs to manage and implement a successful city-wide septage management program.
- **More than 2,000 stakeholders with increased capacity to adapt to climate impacts.** Be Secure conducted a total of 144 training sessions for local partners, including the academe and local communities to help them interpret and use scientific data and information and be able to continue updating their risk matrices and maps and calibrate their plans. In addition to trainings, a more effective approach used by Be Secure in building capacity was twinning, more commonly known as mentoring. This approach was applied to the Provincial Government of Leyte on the area of disaster risk reduction. It was also adopted for the project's partner LGUs and water districts on integrating climate resilience in business and emergency response planning as well as water demand management.

ACTIVITY CORNERSTONES

❖ **Downscaled Hazard, Climate, and Risk Information**

Providing our local partners with city-specific scientific information and tools, including GIS-based climate hazard maps, climate risk maps, vulnerability studies, and hydrological risk assessments was critical to supporting their efforts in working towards climate resilience.

❖ **Capacity Building and Knowledge/Best practices Exchanges**

Providing our partners with scientific data/information and tools was very important but perhaps more critical was helping our partners to interpret and use these scientific data/information and tools so that they can then continue to use them and update their risk matrices and maps and calibrate their plans accordingly. Be Secure used twinning partnerships, workshops, knowledge exchanges, and our Community of Practice among other tools to build capacity among local partners.

❖ **Strategic Communications**

Be Secure created real partnerships with the media to extend and enhance our impact. Journalists were invited to all functions not just to get media coverage, but also to educate them and create a cadre of media experts who could promote the messages. Be Secure engaged in outreach activities to help increase public education and awareness about water. Be Secure exhibited or displayed its communication and marketing materials in numerous events and workshops and supported its partners to organize special events, such as for World Water Day and World Toilet Day.

APPROACHES

❖ **Sustainability built into implementation strategies**

Be Secure Project has been able to accomplish much in the last four years. However, considering that climate risk and water scarcity are expected to increase over time, it is important that these efforts are sustained. There was thus a conscious effort to consider sustainability from the very beginning by employing a number of strategies. These include: designing activities that respond to local needs, developing trainers out of people trained, working with legacy institutions that can continued the project's initiatives long after it ended, and engaging stakeholders who have the passion and ability to drive change.

❖ **Integration across water supply and climate change adaptation results**

Water systems within Be Secure's focal areas which were adversely affected by typhoons and/or flooding had to be rehabilitated and built back better – meaning they had to be made climate-resilient. To attain this, the project used geo-hazard maps as reference in the siting of facilities to avoid locating them in high risk areas and making sure that structures could withstand stronger winds. Be Secure also made use of climate projections determining river discharges for water sources, for long-term mitigation measures such as projecting flood levels and river discharges as well as for the hydrology study to build an impounding dam for Zamboanga City.

❖ **Monitoring, Evaluating and Learning**

To ensure effective project implementation, Be Secure developed a Monitoring and Evaluation Plan (MEP) to specify how project results should be measured. The data collected and reported for each indicator provided USAID/Philippines detailed information regarding the project's progress and impacts throughout the course of the project. As a result, Be Secure was able to

draw lessons that informed planning, design and implementation of activities as well as led to an adjustment of strategies or approaches in aspects where they are not working.

LESSONS LEARNED & WAY FORWARD

Throughout the implementation of project activities, Be Secure has celebrated its successes while recording its challenges and lessons learned. The most important lesson we can draw from Be Secure's work is that teams need to work together across objectives in order to achieve holistic success that will have long-term sustainable impacts. Our IRI and IR 2 teams collaborated on almost every activity, whether it was through activity design in work-planning, joint workshops, or sessions with water districts and LGUs. Some additional key lessons learned and recommendations include:

❖ **Non-Revenue Water**

Almost all water districts in the Philippines suffer to some extent from losses in their distribution network. Water Districts need to invest in identifying and addressing NRW, which will in turn save them money in the long run and provide more consistent access to their customers.

❖ **Partnership Challenges**

The PPP process is arduous and can experience severe delays, especially in light of weak regulations and processes to guide the PPP process. Be Secure recommends opening the PPP process to get multiple bids as to ensure the water district and residents get favorable terms.

❖ **Water Demand Management as a part of broader water sector reform**

Water Demand Management, introduced by Be Secure and quickly adopted by several partner cities, provides an immediate path forward for areas dealing with insecurity now. Projects like Be Secure can support these national level water reform efforts with data, research results, public opinion polls, drafting of legal language, but the imperative must come from inside the government or as advocacy from municipalities and water districts.

❖ **Sanitation**

While sanitation efforts were very successful under Be Secure, conflicts between LGUs and WDs and challenging political environments made adoption of ordinances and implementation of projects challenging. Be secure recommends sewerage to replace sanitation services and to avoid a single-centralized system , but rather de-centralized in a way that can be customized to the water supply of the city.

❖ **Disaster Response and Risk Reduction**

The devastation caused by Typhoon Yolanda has brought to the fore the negative impacts of climate change to water infrastructure. More resilient design measures must also be coupled with the need for behavioral change and encourage water efficiency from both the supply and the demand side.

❖ **Climate Resilience**

Ensuring the availability of safe water to sustain natural systems and human life is integral to the success of the development objectives, and policy goals of the Philippines. As such, understanding changes in climatic conditions in vulnerable areas is important in developing an effective, institutionalized response to reduce and mitigate disaster risks and adapt to climate change.

Table 1: Performance targets and results over the life of the project

Intermediate Result 1: Increased Sustainable Access to Water Supply Services								
Type	Indicator	Target	Baseline	Year 1	Year 2	Year 3	Year 4	LOP Result
F	1.1 Number of people gaining access to an improved drinking water source	1,200,000	850,095	149,776	229,677	930,943	556,010	1,866,396
F	1.2 Number of people gaining access to an improved sanitation facility	400,000	0	0	123,186	446,823	474,706	1,044,715
C	1.3 Number of improved water and wastewater treatment policies, laws, plans strengthened, developed, adopted and/or implemented	131	0	11	77	34	23	145
C	1.4 Number of improved water and wastewater treatment model actions strengthened, developed, adopted and/or implemented	7	0	1	5	6	2	14
C	1.5 Number of water service providers with increased capacity to deliver water supply, wastewater treatment or sanitation services	222	0	49	79	64	131	323
C	1.6 Number of person hours of training in improved water and sanitation practices	38,682	0	16,774	13,408	11,488	3,979	45,649
C	1.7 Amount of non-USG funds mobilized and applied towards improved water and sanitation	\$17,275,962	0	\$2,582,097	\$6,161,686	\$17,155,712	\$57,977,998	\$83,877,491
Intermediate Result 2: Increased Resilience to Climate-Related Water Stress and Hydrological Extremes								
Type	Indicator	Target	Baseline	Year 1	Year 2	Year 3	Year 4	LOP Result
F	2.1 Number of stakeholders with increased capacity to adapt to the impacts of climate change as a result of USG assistance	1,575	252	557	1,084	112	249	2,002

Intermediate Result 2: Increased Resilience to Climate-Related Water Stress and Hydrological Extremes

Type	Indicator	Target	Baseline	Year 1	Year 2	Year 3	Year 4	LOP Result
C	2.2 Percent increase in stakeholder satisfaction with information provided by PAGASA regional offices	38%	60%	0	36%	24%	39%	39%
C	2.3 Number of LGUs awarded with seal of disaster preparedness	4	0	0	0	4	0	4
C	2.4 Number of LGUs with risk-sensitive development and land use plans	5	0	0	3	2	4	9
F	2.5 Number of institutions with improved capacity to address climate change issues as a result of USG assistance	60	20	3	22	22	57	104
C	2.6 Number of climate change mitigation and/or adaptation tools, techniques and methodologies developed, tested or adopted as a result of USG assistance	30	0	3	15	14	2	34
F	2.7 Number of person hours of training in global climate change as a result of USG assistance	46,044	0	11,030	28,664	12,814	18,584	71,092
C	2.8 Change from baseline in risk of hydrological disasters at the LGU level	38%	0	0	0	0	35%	35%
C	2.9 Percentage of people trained in disaster recovery and resiliency of water supply systems who applied their knowledge within two months	38%	0	0	52%	62%	62%	59%
C	2.10 Amount of investment leveraged in US dollars from private and public sources for climate change and disaster risk reduction as a result of USG assistance	\$1,030,000	0	\$56,610	\$2,549,434	\$1,979,263	\$2,316,468	\$6,901,775



CONTEXT

The Philippines, Southeast Asia's oldest democracy, is a key development, trade and security partner to the United States. Its economy has grown substantially in recent years, but the gains have yet to translate to benefits that will improve the lives of many Filipinos. Since 2012, the governments of the U.S. and the Philippines entered into a new Partnership for Growth (PFG), a whole-of-government effort to address the Philippines' most binding constraints to lasting, shared growth: ineffective governance, insufficient public financing, inadequate infrastructure and weak human capacity.

Water security is a major input to achieving economic growth in the rapidly growing Philippines. While nationally, there is an abundance of resources, water scarcity is increasingly felt at the local level. Water quality is an increasingly serious problem with expanding productive activities in agriculture and industry. Domestic wastewater is the main source of bacterial contamination and nutrient loading, while industrial and agricultural point and non-point source pollution add a range of other chemical and toxic contaminants. Salinity is a growing problem in areas dependent on coastal groundwater, primarily caused by over-abstraction of aquifers, with some water utilities and private companies already closing wells over water quality concerns. And degraded water quality presents serious direct problems for both human and ecosystem health, rendering scarce remaining freshwater resources unsafe for use by humans. The annual economic losses caused by water pollution in the Philippines have been estimated at US\$1.3 billion, including impacts associated with health costs, reduced fisheries production, and adverse impacts on tourism.

In addition to water security issues, the Philippines is vulnerable to natural disasters. Because of its geographic location, the Philippines is known to be one of the world's most disaster-prone countries and loses up to \$5 billion every year due to natural disasters. In 2013, Super Typhoon Yolanda, the strongest typhoon in modern history, devastated much of the Philippines with winds, heavy rains and catastrophic storm surge. The Leyte Province was among those provinces that suffered massive damage to lives, livelihood, infrastructure, industry and environment. In addition to typhoons, the Philippines is also vulnerable to extreme weather events such as drought and flooding, which can directly impact on quality and quantity of freshwater resources and affect overall long-term security. As part of its broader effort to foster more inclusive economic growth, USAID works with the Philippine Government to enhance resilience by improving natural resource management and reducing disaster risks. Critical to this is improving water security and reducing the vulnerability of communities to natural disasters.

PROJECT OVERVIEW

USAID's Water Security for Resilient Economic Growth and Stability (Be Secure) Project in the Philippines, awarded on July 8, 2013, has been a four-year activity that worked to promote good governance and build capacity for long-term water security, improve access to water and wastewater treatment services, and build more resilient communities. Be Secure focused on achieving two intermediate results (IRs):

1. Increased sustainable access to water supply and wastewater treatment services; and
2. Increased resilience to climate-related water stress and hydrological extremes.

At the national level, the project's activities focused on strengthening water sector regulatory reform. For local and regional activities, the project works with LGUs and water service providers (WSPs) at the watershed scale to improve capacities for integrating climate change into local planning and the provision of water supply and wastewater treatment services. Be Secure closely coordinated with the Government of the Philippines, both national and local government units, and other key counterparts including water service providers (public and private) and nongovernmental organizations. Be Secure also worked in partnership with academic institutions as centers of excellence that can sustain project initiatives.

Increasing sustainable access to water supply and wastewater services. Be Secure facilitated stakeholder dialogues and supported policy reform initiatives designed to increase government accountability on service delivery and improve water sector performance. Challenges within the entire value chain of water supply service provision will be addressed, from the source water supplying domestic water systems to sustainable operations of the services themselves. The focus is on providing new water connections and wastewater treatment services, and strengthening the institutional structure, governance, management, regulation, and operation of water service providers and the government agencies that support them in a way that catalyzes larger financial flows, and ensures the viability of high quality services over time.

Increasing resilience to climate-related water stress and hydrologic extremes. Be Secure worked on strengthening the analysis, communication, and use of water resources and climate data by decision-makers to increase resilience. Work under this IR also focused on improving CCA and DRR inputs to planning at the city level, and supporting disaster recovery at the local level following extreme hydrological events such as Typhoon Yolanda in Leyte. The Project worked on improving understanding of long-term water security issues and options, and mainstreaming of integrated water resources management into water supply and wastewater treatment services, policy, planning and investment. Increased public awareness and support for sustainable use and consumption of water resources was also a crucial focus.

In both components, gender integration served as a critical focal point. Be Secure ensured that both men and women's differential interests were reflected in workshops, field work, and results, with their voices and experiences included in project design and implementation.

Be Secure worked at the national level and in six geographic sites, as shown on the map on the next page. During the first two years, the project also worked in Tuguegarao City on IR 2 activities. Three of the key cities were Cities Development Initiative (CDI) cities where several USAID projects worked in synergy.

BE SECURE FOCAL AREAS

PROVINCE	KEY CITIES/MUNICIPALITIES
Basilan	Isabela City, Maluso, Tipo-Tipo, Lamitan City
Iloilo	Iloilo City*
Leyte	Tacloban City, Ormoc City
Maguindanao	Cotabato City
Misamis Oriental	Cagayan de Oro City*
Zamboanga Peninsula	Zamboanga City*

CITIES DEVELOPMENT INITIATIVE (CDI)

CDI is a USAID initiative working to strengthen the economic competitiveness and resilience of secondary cities outside of Metro Manila. USAID provides specialized technical assistance, depending upon the needs of the six cities, Batangas City, Cagayan de Oro City, Iloilo City, Puerto Princesa City, Tagbilaran City, and Zamboanga City to assist the cities achieve resilient and inclusive growth.

*CDI City



Figure 1: Be Secure Focal Area Map

The [Be Secure] project has raised awareness among local communities about water security. More Filipinos now have a better understanding that reliable and efficient water and sanitation services are key; not only to protecting health, but also to driving investment, providing jobs, protecting health and ensuring food security. This really has been a wonderful initiative, a great example of the type of thing that we can accomplish when we work together, another great example of close cooperation between our two great countries...”

**- AMBASSADOR SUNG Y. KIM,
U.S. AMBASSADOR TO THE
PHILIPPINES**

PROJECT RESULTS

Be Secure met or exceeded 16 of its 17 performance indicators—an impressive achievement. It is more impressive when the results are compared with the targets. For the three most important indicators, which are number of people with access to improved water and sanitation and number of stakeholders with increased capacity to adapt to the impacts of climate change, the results significantly exceeded the targets, as shown in the table below. Results exceeded targets by more than 10% for ten additional indicators.

Table 3: Top Three Indicator Results

Indicator	Target	Result	% Above Target
1.1 Number of people gaining access to an improved drinking water source	1,200,000	1,866,396	56%
1.2 Number of people gaining access to an improved sanitation facility	400,000	1,044,715	161%
2.1 Number of stakeholders with increased capacity to adapt to the impacts of climate change as a result of USG assistance	1,575	2,002	27%

The excess results occurred because the activities undertaken were not anticipated when the targets were set. Many of Be Secure’s partners responded more positively and took stronger action than expected in response to the project’s interventions, and Be Secure developed some new activities such as WDM.

Although the target for Indicator 2.8, “change from baseline in risk of hydrological disasters at the LGU level” was a 38% reduction in risk compared to the baseline, the results from the four cities could not accurately be translated into an average across all hydrological hazards, vulnerable elements and cities. Therefore, we have not reported a numerical result for this indicator.



INTERMEDIATE RESULT I: INCREASED SUSTAINABLE ACCESS TO WATER SUPPLY AND WASTEWATER TREATMENT SERVICES

Be Secure's strategy in the water sector, under the leadership of Team Leader Ariel Lapus, was initially to address those areas with little or no access to water, primarily in rural areas, by providing training and one-on-one technical assistance to those small LGU-run WSPs that needed to develop plans and budgets in order to access funds from DILG's Sagana at Ligtas na Tubig sa Lahat (Abundant and Safe Water for All) (SALINTUBIG) and Bottom-Up Budgeting programs and DSWD's National Community-Driven Development Program. A second tier activity was to ensure access within cities where large populations were either under-served or not served at all. A third tier of activities was added later once the climate forecasts clearly indicated where water access might be threatened and provided technical solutions that would support secondary water source development and greater efficiency in existing water consumption.



WOMAN WATERING PLANTS AT THE PASE RURAL IMPROVEMENT CLUB IN BGY.PASE, ILOILO WHERE BE SECURE OBTAINED FUNDING FROM DOW CHEMICAL FOR MUCH NEEDED WATER SYSTEM REPAIRS

ACCESS TO IMPROVED WATER SUPPLY

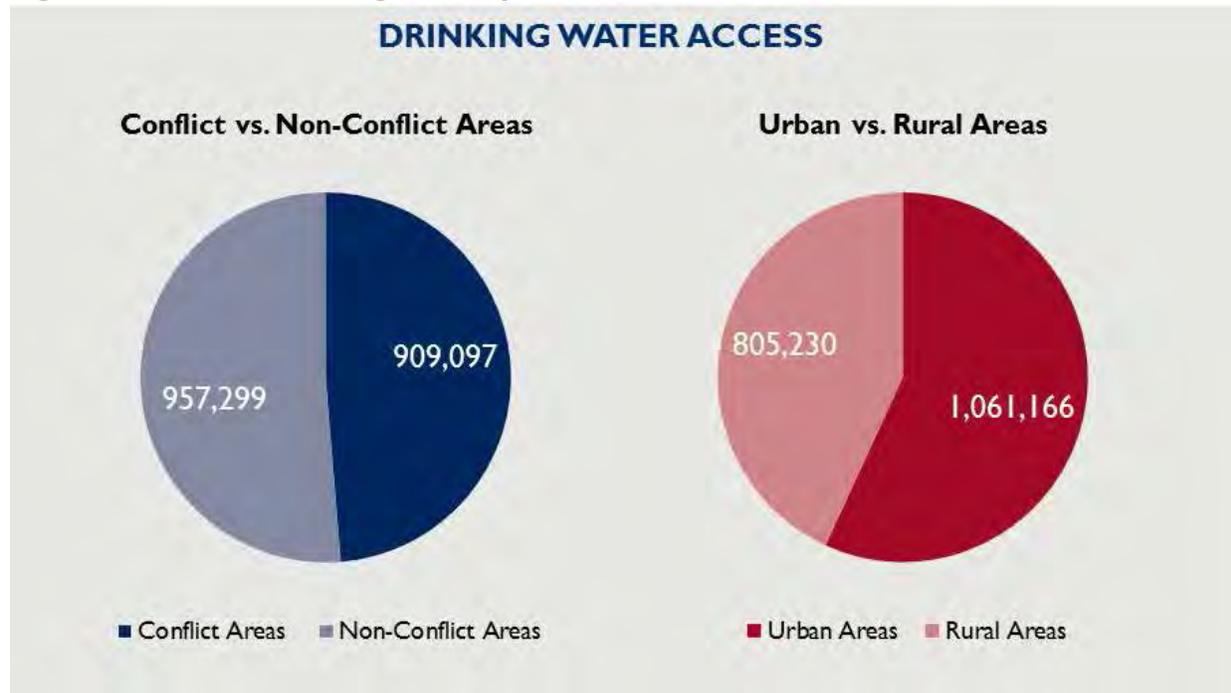
1,866,396

Be Secure increased access to an improved drinking water supply for 1,866,396 people

Be Secure exceeded its 1.2 million LOP target for increasing access to an improved drinking water source by 56% for a total of 1,866,396 people. More than 81% of these people lived in Misamis Oriental, Leyte and Iloilo Provinces and about 56% lived in urban areas and 44% in rural areas. And 909,097 of the people assisted lived in conflict-affected areas¹ in Mindanao, exceeding the 500,000 person target stipulated in Be Secure's contract.

About 1.19 million or 64% of the total access numbers were a result of Be Secure's engagement with water districts in its focal areas (Table 3). This included reduction of CDO's NRW, development of a PPP in Iloilo, protection of Tacloban City's main water source from erosion, and development of a small water system for Malamawi Island in Basilan. These activities are described below, followed by a description of Be Secure's assistance to LGUs to develop water supply systems funded by DILG's SALINTUBIG Program and DSWD's NCDDP program, which contributed more than 650,000 or 35% of Be Secure's access numbers.

Figure 3: Access to drinking water by conflict vs. non-conflict area & urban vs. rural



¹ Be Secure conflict-affected areas in Mindanao include Basilan, Maguindanao, Misamis Oriental and the Zamboanga Peninsula.

Table 4: Breakdown of number of people with access to water by source and focal area

FOCAL AREA	WATER DISTRICTS	LGUS (DILG & DPWH)	LGUS (OTHER)	TOTAL
Basilan	5,634	50,625	0	56,259
Iloilo	300,000	66,297	22,149	388,446
Leyte	430,211	138,642	0	568,853
Maguindanao	0	127,085	0	127,085
Misamis Oriental	455,424	92,658	0	548,082
Zamboanga	0	177,671	0	177,671
Total	1,191,269	652,328	22,149	1,866,396

Note: Others include projects done through Be Secure subcontractor Philippine Business for Social Progress and in partnership with the Iloilo Rural Water Supply and Sanitation Project

FEASIBILITY STUDIES FOR NEW WATER SOURCES

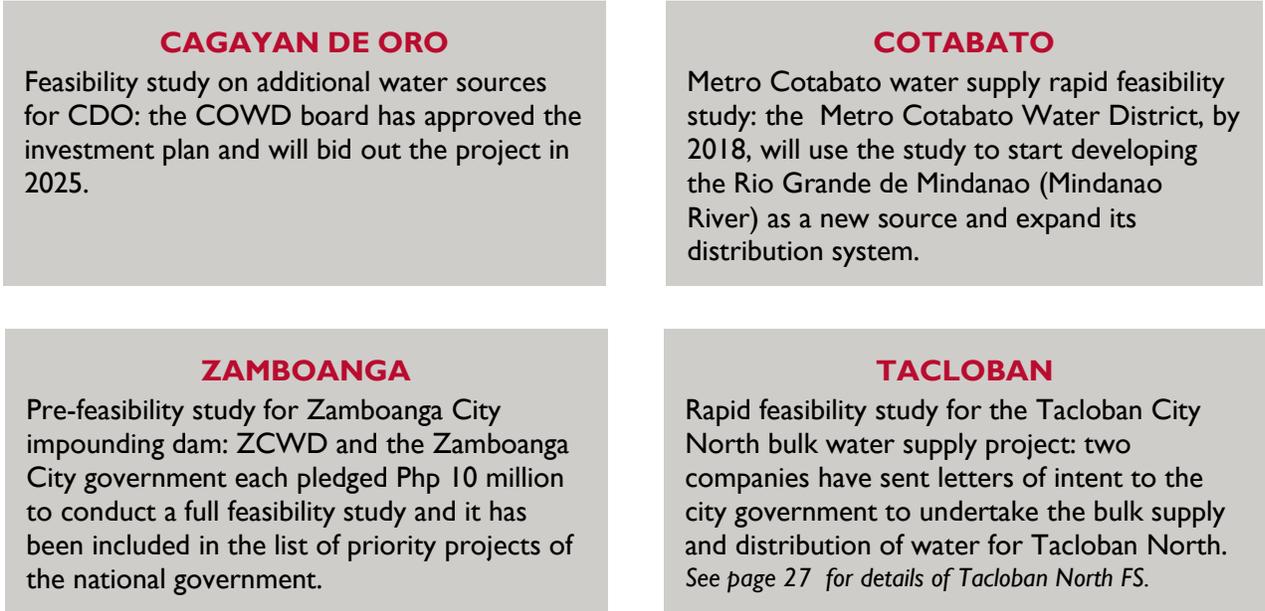
Be Secure spent a significant amount of time and project funds studying the feasibility of developing new sources of water for four focal cities: Cotabato, Tacloban, CDO and Zamboanga. The studies were done in response to requests from the respective water districts or city government in the case of Tacloban. These partners were concerned about both their current shortfalls in supplying water to their customers, especially during the El Nino event in 2015-2016, and future decreases in water availability predicted by the downscaled climate projections produced by Be Secure subcontractor



THE PONGSO RIVER AFTER A FLOOD. THE WATER IS RELATIVELY CLEAR, MAKING IT A GOOD SOURCE OF WATER FOR TACLOBAN CITY NORTH.

Manila Observatory. These studies provided local decision makers and private companies (in the case of Tacloban) valuable information on the current and future demand for water, the merits of the available technical options and expected costs of the proposed projects. In some cases, a thorough review of the study and other available options will result in a decision to choose another solution. While this technical assistance did not contribute to achieving Be Secure’s indicator results for water supply access, it is still an important accomplishment. These feasibility studies that were incorporated with climate resilient considerations improved our partners’ ability to make a sound decision and meet the needs of its customers. The following is an update of the current status of each feasibility study.

Figure 4: Feasibility Study Status as of July 2017



PROTECTING TACLOBAN'S WATER SUPPLY

200,000

200,000 people will benefit from the Tacloban North Water Supply FS prepared by Be Secure & CEST

Typhoon Yolanda, and other strong storms that affected the Tacloban area, accelerated erosion of the banks of the Binahaan River, which is the major source of water for 28,475 households in Tacloban City and surrounding areas. The Leyte Metro Water District's (LMWD) was worried that the changing course of the river would eventually form an oxbow lake a few hundred meters upstream of their water intake, which would significantly reduce its ability to supply their customers with water. In response to LMWD's request for assistance, Be Secure engaged the services of a subcontractor (Sky Eye) to take aerial photographs of the river and engaged an engineering firm (Royal Haskoning DHV) to conduct a study and develop several options to mitigate the threat. The aerial photographs showed that although landslide scars were observed, the oxbow area did not appear to be at risk of future landslides. Be Secure's study found that erosion of the critical area of the river is unlikely, but there are additional risks to the weir that will require mitigation. They developed several options to protect LMWD's intake and presented these to LMWD management and Board of Directors on December 14, 2015.

Following guidance from the board, Haskoning completed detailed design drawings of the recommended plans, both short- and long-term priorities, and quantity and cost estimates for the mitigating measures. As a result, the Leyte Provincial Government provided Php 25 million for river training works along the critical area. The intervention benefited 154,970 people in Tacloban City and surrounding areas.



AERIAL MAP OF TINGIB INTAKE POINT OF THE BINAHAAN RIVER

“The study and designs have immensely helped in guiding us in preventing major damage to intake facilities to ensure continuous water service to [over] 140,000 people in our service area.”

**- PASTOR A. HOMERES,
GENERAL MANAGER OF LMWD**

NRW REDUCTION IN CAGAYAN DE ORO

\$300,000

Be Secure obtained \$300,000 from the Cocoa Cola Foundation Philippines to reduce NRW in CDO

Almost all water districts in the Philippines suffer to some extent from losses in their distribution network. Referred to as non-revenue water (and sometimes unaccounted for water), the resulting losses hamper efforts to expand the distribution network to underserved or non-served populations. Many water districts serve only a small percentage of the population within their service

area, and some customers only get water for a few hours a day. When rationing takes effect in the summer, even these subscribers may have to get water delivered by trucks as low water pressure no longer allows for easy distribution.

Be Secure determined early on that helping our partners address these losses was the primary task of any demand management system to save water already in the system and defer the construction costs of developing alternative water sources. NRW reduction, however, is not easy and can require a great deal of time and money. Of the three CDI cities in Be Secure’s focal areas, two had made arrangements independently of the project to reduce NRW. Zamboanga City Water District (ZCWD) contracted Manila Water to help reduce its NRW. In Iloilo, an unsolicited PPP bid from private sector firm MetroPac Water Investments Corporation (which like Maynilad Water is a subsidiary of Metro Pacific Investments Corporation), will likely reduce NRW losses as one of its first tasks (see *description of the PPP on pg 31*).

In CDO, the Japanese International Cooperation Agency (JICA) undertook the “Special Assistance for Project Sustainability for Cagayan de Oro Water District for Provincial Cities Water Supply Project Phase III,” to help reduce NRW, which it estimated to be 54% (later determined to be closer to 58% after Be Secure did its own field research). COWD obtained a PhP458 million loan from the Development Bank of the Philippines for NRW

“When Be Secure decided to help us with our NRW, it was like a manna from heaven! We then had our plan on NRW reduction drafted in 2012 or 2013, applied a loan to fund such, but through God’s grace, blessing in disguise, the loan did not materialize until we got technical assistance from USAID Be Secure. Should we have gotten the loan without the TA, I couldn’t imagine how disastrous could that be!”

- RACHEL BEJA, GENERAL MANAGER, CAGAYAN DE ORO WATER DISTRICT



PARTNERS, INCLUDING COWD, USAID AND BE SECURE AT THE COWD NRW PROGRAM LAUNCH

reduction and requested Be Secure to help them develop an NRW reduction strategy and begin implementation. Be Secure agreed, on condition that the water savings would be used to provide approximately 400,000 people with new or improved services. Be Secure was also able to obtain \$300,000 from Coca-Cola Foundation Philippines for the GIS portion of the program, which allows COWD to get accurate data in water supply in real time to identify and address NRW problem areas.

Be Secure subcontracted Miya Philippines to implement the technical assistance under the leadership of Technical Specialist Demosthenes “Didi” Redoble and AECOM NRW Reduction Specialist Donald Champenois. Miya worked with COWD to undertake the following:

- Develop a GIS;
- Establish a calibrated hydraulic model;
- Identify 22 district metering areas (DMAs);
- Conducted zero pressure tests (ZPTs) in the 22 DMAs (due to unavailability and the delay in procuring materials, Miya was only able to complete 8 successful ZPTs out of the 22 DMAs).
- Developed 11 standard operating procedures for COWDs day-to-day operations;
- Developed an NRW management strategy;
- Conducted trainings on DMA establishment, hydraulic modeling, GIS, metering, and leak detection.



COCA-COLA FOUNDATION MOU SIGNING IN APRIL 2015

After successful implementation of the program, NRW in 2026 could be as low as 25,000 m³/d – a 75% reduction from the initial level of 100,000 m³/d. Additional investments of PHP 2.5 billion will be required to achieve this target, but the financial benefits to COWD from increased revenues and reduced production cost were calculated to be in the order of PHP 3.5 billion, leaving a financial net benefit of around PHP 1 billion.

It was during this activity that Be Secure became aware of two major factors that impeded smooth flow of work, both of which relate to

Philippine government procurement processes. These factors also caused delays in Zamboanga City’s effort to access NSSMP funding and Maguindanao Province on DILG ARMM funds. The delays were mostly due to:

- Slow release of funds by government, even when pre-approved. In the case of COWD it took several years to obtain the loan proceeds and even then they were only given half the approved amount. This compromised COWD’s ability to provide the equipment and materials and later the staff to work on establishing and completing the DMAs.
- The second was the requirement by government to award contracts for equipment to the lowest bidder. As a result, of the 17 bids that were awarded by COWD, many vendors provided sub-standard equipment that had to be sent back, and re-bid, further delaying the work.

While neither of the above problems affected the technical assistance portion nor the training of COWD staff on GIS systems, it hampered COWD from completing the DMAs in the remaining time of the project.

PARTNERSHIPS FOR SOLUTIONS

PPP TO IMPROVE WATER AND SANITATION SERVICES IN ILOILO

300,000

MetroPac plans provide 300,000 people with access to improved drinking water for the first 5 years of the PPP- an estimated cost of \$48M Php.

Metro Iloilo Water District (MIWD) is only able to serve approximately 20% of the population in its service area with its current network. It also suffers from water supply problems, excessive NRW levels, low water quality, ageing assets and operational inefficiencies. Many customers only receive water a few hours a day; some receive none during the summer months. On December 29, 2014, MIWD received an unsolicited proposal to enter into a joint venture with MetroPac and eventually asked Be Secure for assistance to evaluate the MetroPac proposal and provide advice to them during the negotiations. The scope covers rehabilitation, upgrading, maintenance, operation, and expansion of MIWD's existing water supply facilities; and establishment of wastewater management facilities. Be Secure subcontractor Lahmeyer, under the leadership of water governance and

policy expert, Ramon "Dondi" Alikpala, provided transaction advisory services to MIWD, which included advising MIWD on legal, economic, technical and financial matters. Due to the lack of the required documents by MWIC, the process took much longer than originally estimated. By the end of 2016, Be Secure had developed a draft joint venture agreement between the private proponent and MIWD, a technical services agreement outlining the technical obligations of the private proponent and a full concession agreement. Following the end of the subcontract in March 2017, Be Secure, through Mr. Alikpala, oversaw the negotiation process and continued providing advisory assistance to the Joint Venture Committee to obtain the needed documents for proper analysis, as well as briefed the MIWD Board members on questions to ask the committee.

The signing of the certification of original proponent status to MetroPac finally came in May 2017, almost 29 months after MetroPac submitted its original letter of intent. By signing this agreement, MIWD officially agreed to the investment needed to improve the water service in Iloilo City. Once MetroPac receives its contract from MIWD, it intends to invest \$12 billion over 25 years, and during the first five years provide 300,000 people with access to an improved drinking water source at a cost of \$48 million. It hopes to leave MIWD considerably strengthened as a service delivery organization and reduce its NRW from about 50% to 30%. While there have been other joint venture projects with other water districts in the past, this is the largest joint venture agreement in the sector; as well as the most comprehensive and transparent.

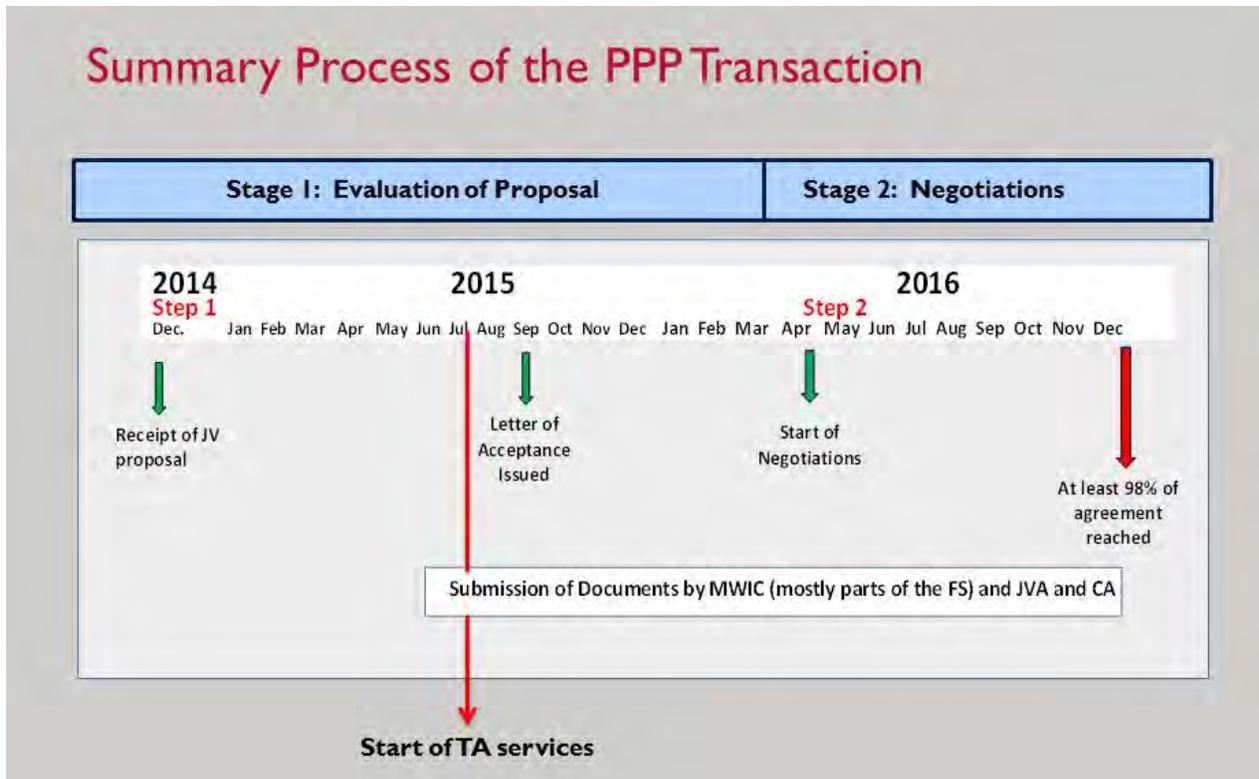
While Be Secure was not able to cover the entire process up to the award of the contract to a winning proponent, the project's technical assistance was able to bring to light weaknesses in the government's PPP process. What should have taken one year at most suffered routine delays, due in part to unclear regulations on procedures and requirements. The process was also hampered by the lack of an independent regulatory authority to provide oversight and was affected by competing interests, even conflicts of interest from the negotiating parties. This was the first time a transaction advisory support had been used in the water sector to evaluate an unsolicited proposal, and given the rigor applied, Be Secure was able to contribute in protecting consumer interests

“The USAID Be Secure project came at a most opportune time when city planners and decision makers needed guidance on how else the city's water crisis can be remedied.”

- JOSE RONI PENALOSA, CITY PLANNING AND DEVELOPMENT OFFICER, ILOILO CITY

and ensuring the viability of the joint venture. Additionally, the project was able to draw lessons from this effort over the two years we were engaged in supporting the PPP. These lessons were presented along with specific recommendations to improve the process with USAID, NEDA and the PPP Center. Currently, there are over 60 unsolicited bids recorded by PAWD with different water districts. Without changes to the PPP process and greater support from LWUA and PAWD to help water districts negotiate with large water companies, residents face the risk of being disadvantaged under a privatized water supply service.

Figure 5: Summary of PPP Transaction Process



PARTNERSHIP WITH DILG AND DSWD TO HELP LGUS DEVELOP WATER SYSTEMS

128 LGUs

Be Secure assisted 128 LGUs in collaboration with DILG to benefit 586,304 people to help access funding for water systems

A large portion of Be Secure’s success in providing access to water came from partnerships with DILG and DSWD to assist small LGUs develop water supply systems. Be Secure provided experts to train small LGU-run WSPs so they could develop water supply projects and apply for funding from DILG’s SALINTUBIG Program (Sagana at Ligtas na Tubig sa Lahat (“Abundant and Safe Water for All”) and Grassroots Participatory Budgeting Process, and DSWD’s NCCDP. Altogether, the sites supported by Be Secure received some \$16.3 million to develop water systems that provided access to 652,328 people. Be Secure conducted training on feasibility study preparation, detailed engineering design, construction supervision and operation and maintenance in Iloilo, Leyte, Maguindanao, Misamis Oriental, Zamboanga del Norte, Zamboanga del Sur and

Zamboanga Sibugay Provinces. Once the forecasts for climate change were made available by Be Secure subcontractor Manila Observatory strategies to increase climate resilience were added to the curriculum and to the planning and designs for new water systems. Be Secure project staff and consultants provided one-on-one mentoring and technical assistance to the LGUs after the workshops to facilitate their applications for funding. Be Secure’s Water Services Coordinator, Engineer Rene Capiz, worked with DILG and DSWD to provide the training and later to assist some of the same LGU-managed water utilities to ring fence their funds. Ring fencing involves preparing an isolated budget so that funds received will be earmarked for specific uses.

In collaboration with DILG, Be Secure conducted 14 trainings for a total of 209 LGUs. Of this, only 128 LGUs obtained funding from DILG, which benefited 586,304 people (see Figure 3 below for the number of LGUs that received SALINTUBIG funding by focal area). The remaining 81 LGUs did not receive funds from DILG, for not meeting DILG requirements either in documentation or in data quality. LGUs dealt with several challenges, which included:

1. Late submissions- DILG provided SALINTUBIG funds on a fixed schedule and if the submissions came in late, the water provider needed to wait for the next round. In some cases the LGUs were not able to complete all the requirements.
2. Inability to submit a complete set of requirements
3. Lack of support from the government officials due to political alliances
4. Water supply insufficient to meet the demand
5. Lack of technical capacity to implement the project

From across all sites, only Iloilo and Misamis Oriental had more LGUs who did not receive funding than those who did (see Figure 4). DILG staff in both provinces reported that the WSPs were often confronted with issues such as: (1) water source selection and development; (2) community acceptance of the type of system to be developed; (3) availability of data to complete the feasibility study; (4) technical capacity of the staff; (5) administrative issues



(such as securing environmental clearance from barangays); (6) staff assigned to do the feasibility study have retirement or moved to another office; and (7) change in priorities to other projects.

Figure 6: Approval rate of LGUs in each focal area for SALINTUBIG funding

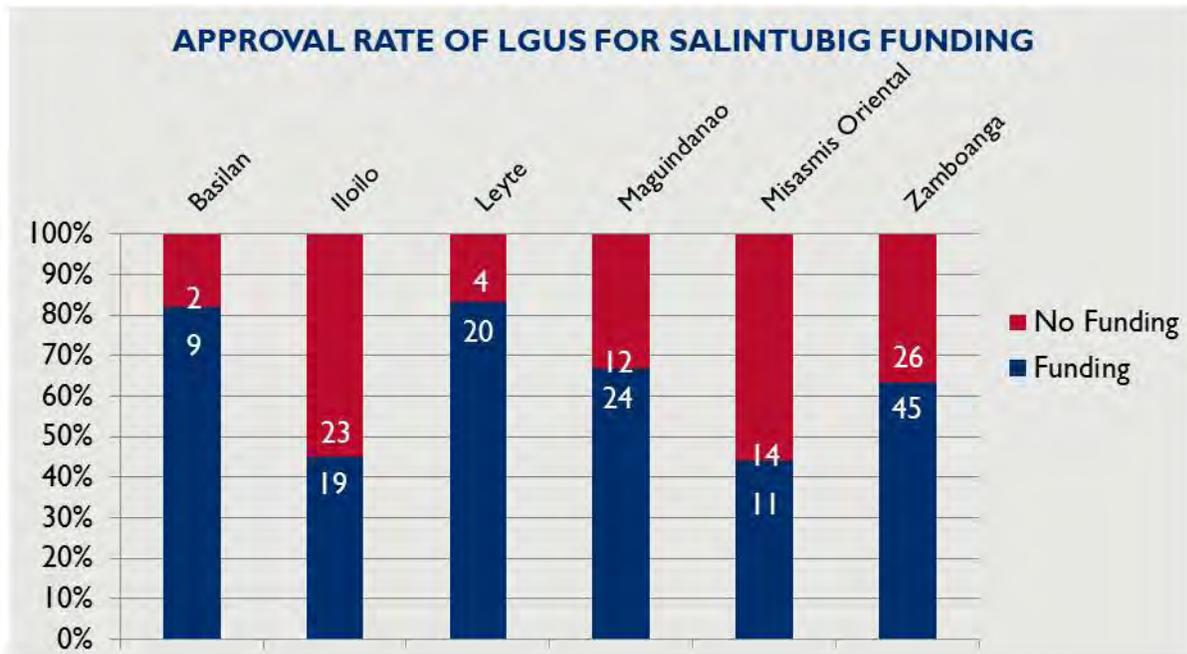
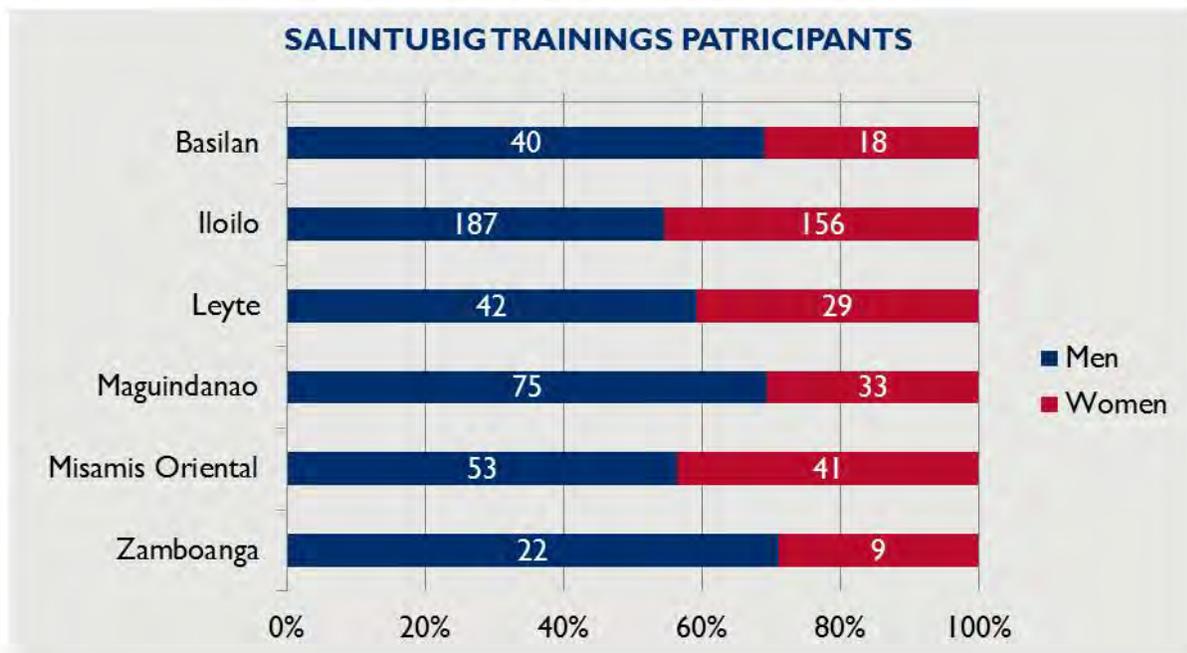


Figure 7: Gender composition of SALINTUBIG trainees by focal area



More men than women participated in the SALINTUBIG trainings, which is mainly due to the technical nature of the training and the fact that technical fields such as engineering tend to be dominated by men (see Figure 5). In all training activities, Be Secure made opportunities available for women to attend and actively participate in the trainings.

Be Secure also trained technical staff of DSWD's NCDDP on water supply operations and on climate resilience integration so they can assist poor and ultra-poor communities in developing water supply projects in Leyte, Misamis Oriental and Zamboanga Peninsula. The Be Secure training helped DSWD's technical staff to understand how to implement water supply projects and guide communities in developing new water systems that can withstand climate impacts. The activity resulted in 65 barangay-level WSPs in 31 municipalities of Leyte, Misamis Oriental and Zamboanga Peninsula to improve and expand their water supply systems and provide access to an improved drinking water source to 66,024 people.



WATE5R SERVICES COORDINATOR ENG. RENE CAPIZ CONDUCTING A SALINTUBIG FS WORKSHOP IN ILOILO CITY IN 2014

WATER ALLIANCE



WATER ALLIANCE LAUNCH IN OCTOBER 2015

Of the several activities supported by subcontractor Philippines Business for Social Progress (PBSP), one of the most useful has been the creation of the Water Alliance, which paved the way for increased private sector participation in the water sector. The Water Alliance is a group of twenty industry-leading companies in the Philippines who will come together to address issues and solutions to looming water supply problems in the country. While PBSP has been moderately active in fundraising for small waterless communities, schools and clinics, the Water Alliance has allowed them (and by extension Be Secure) access to high level decision makers in the private sector that have considerable influence among their peers. The representatives to the Alliance are chief executive officers and managers of the largest firms in the Philippines. Convinced that water security is an urgent and compelling issue, the Water Alliance endorsed working on several issues such as: water sector reforms, increasing access of communities to water supply, water demand management (WDM), and research and development.

As concrete action, the Alliance promoted WDM to show, by example, how firms and businesses can benefit from adopting WDM measures. The Alliance was substantially motivated by El Niño in 2015 and 2016 when dam levels dropped drastically and rationing was briefly contemplated in Metro Manila. Be Secure offered Water Alliance members exposure to senior experts from foreign countries who shared their experiences in implementing WDM and the corresponding savings in both water and money.

When Be Secure's WDM expert Tom Pape gave a series of lectures in Metro Manila for the CEOs, many saw an opportunity to save their firms' money from reduced water bills as well as promote water efficiency to the public. Commercial firms use water in multiple ways. It is used in manufacturing or delivering their products and goods. It is the main product used by beverage and bottling companies, making reduced water consumption particularly challenging. For some firms, water is used in canning, cleaning of facilities, and sterilization of food containers. For several large firms it is also the water used by their employees in office bathrooms, commercial kitchens and laundry facilities, either during working hours or in residences provided by the firm for staff. Finally, water is used in landscaping the sites of these large firms and factories, cleaning outdoor areas with hoses, washing vehicles and trucks. All these together make up a firm's water footprint and present opportunities where both money and water savings can be explored.

Driven by these opportunities, the Alliance collaborated with Be Secure and agreed to co-share the costs of a water audit training using facilities at the SEDA Hotel in Manila. Be Secure covered the transport cost of an expert while the Alliance covered the fees. Tom and Valerie Pape were able to step in and provide expert training assistance. That experience was pivotal in a number of ways as the number of firms that wished to send attendees multiplied exponentially. As a result, PBSP developed training modules and is now offering the following short courses, activities and opportunities to its members: Water Footprint Management Training, Septage Management Programs for Localities, Roundtable Discussion on Water Issues, and Potable Water Systems for Rural Communities. These initiatives ensure the sustainability of USAID investments in water security as led by the private sector.

IMPROVING EXISTING INFRASTRUCTURE

MALAMAWI ISLAND WATER SUPPLY

Be Secure responded to a request from the ISAWAD to assist in developing a water supply system in Malamawi, a small island that is part of Isabela City just off the coast of Basilan. Following intentional destruction of a submarine water pipeline running between the islands several years ago, potable water had to be transported by boat from Basilan Island. After Be Secure conducted tests that showed there is sufficient groundwater on the island, the project's subcontractor completed two wells on March 11, 2016. The wells have a total capacity of about 6 liters per second, which can supply about 4,000



GROUND BREAKING CEREMONY FOR THE WELL ON MALAMAWI ISLAND ON OCTOBER 28, 2015 WITH WATER BOARD MEMBER AND COMMITTEE CHAIR ON ENVIRONMENT HON. MASHUR ISMAEL, ISAWAD GENERAL MANAGER MS. ALELI ALMODOVAR AND BARANGAY OFFICIALS

people with water. The wells are primarily intended for the schools and health clinics on the island, but since the yields are quite high, ISAWAD allocated funding to develop a distribution system, which will also provide water to residents living near the wells. ISAWAD inaugurated the Malamawi Island Water

Supply Pumping System on July 5, 2017. With Malamawi having its own sufficient water supply, mainland Isabela City, which suffered from severe water shortages during the 2015/2016 El Niño (half hour/day availability) will have more water available to its own residents in the mainland. Both Basilan and Malamawi islands have been affected by high levels of conflict, especially related to the Abu Sayyaf, and better water supply services contribute to reducing their vulnerability to such conflicts.

IMPROVING WATER SUPPLY SYSTEMS IN MAGUINDANAO

CLIMATE-RESILIENT REPAIRS IN MAGUINDANAO



11 Schools



4 Health Clinics



1 Hospital

WSPs in Maguindanao Province struggle to provide water supply services to its citizens due to high levels of poverty and years of conflict and underdevelopment. Unfortunately, Maguindanao suffered more than any other province in Mindanao from lack of water during the 2015-2016 El Niño both in urbanized areas and in smaller communities.

Consequently, Be Secure included rainwater harvesting systems in the water supply systems it designed and installed schools and health clinics, and also rainwater harvesting systems as a climate adaptation feature in the designs developed for nine municipal systems provided to DILG-ARMM. The design work, done by subcontractor A Single Drop for Safe Water, included climate-resilient engineering designs, bills of quantities, financial/tariff analyses, and environmental compliance inputs for water supply systems of ten schools and health facilities and nine LGUs in Maguindanao. Be Secure obtained Php 868,500 (about \$18,880) from Hyperion Fund to develop the designed water systems for Datu Udtog Matalam Elementary School in Pagalungan and the Rural Health Unit in Barangay Bugasan Sur, Matanog; the systems are completed and operating.

To develop water supply systems for the remaining eight schools and health facilities, Be Secure entered into a subcontract with Angkat Construction and Supplies while Single Drop supervised the work. Single Drop also helped Be Secure look for funding to develop the nine LGU water systems, but as mentioned above, funding was not secured by the end of the Be Secure Project. Single Drop is commendable for their perseverance and professionalism, having completed the work in a difficult part of Mindanao, with their staff sometimes interrupted by violence and military interventions.



A YOUNG GIRL STANDS OUTSIDE THE RENOVATED TUMBABO CENTRAL ELEMENTARY SCHOOL IN MAGUINDANAO

NEW WATER SYSTEM IMPROVES HEALTH CARE SERVICES IN MAGUINDANAO



The staff of rural health unit-Matanog used to spend their own money for drinking water. Even the water for washing and cleaning had to be sourced from a town about 14 km away. They also had to pay for transport services to fetch water. Without enough water, they couldn't clean the rest rooms and kitchen properly. The standard hand washing practice was sometimes ignored due to water scarcity. Persistent armed conflict in the province hampers the delivery of basic services such as water and sanitation to its people. In 2015, the province reported that only 35 percent of total households had access to potable water, and 33 percent had access to basic toilets. This is far below the 2015 national average of 92 percent of the total Philippine population having access to water supply and 78 percent with access to a sanitation facility.

All this changed when the water system built by Be Secure and Hyperion Fund was formally turned over last December 2015. With this water system now in place in the RHU, patients and health personnel enjoy a daily supply of clean drinking water in the delivery room, laboratory room, latrines, kitchen, and hand washing facility. Health care services to the community have improved and the RHU can meet the needs of at least 60 patients every day. Bulawan Dimacompas, Public Health Nurse, now can see the happy faces of her staffers tending to the patients seeking medical attention.

“Since we have enough water supply, we will open the RHU 24/7 to address the needs of our patients, especially mothers who will give birth via normal delivery” said Ms. Dimacompas. She added that they allocated a fund for the operation and maintenance of their water system and have a dedicated staff to ensure that the system is always in good running condition. Families surrounding the health unit can also avail of the potable water should they need it. Maimona Mangdag, RHU staffer, said that the water system is a “gift” and their long-time dream for steady supply of potable water in the health unit. “Rendering health care services for the people of Matanog became easier than before because of the access to clean and sufficient water through the help of USAID.”



RHU MATANOG IN MAGUINDANAO PROVINCE

ACCESS TO IMPROVED SANITATION

1,044,715

Be Secure increased access to an improved sanitation facility for 1,04,715 people

Improving sanitation services in the Philippines has been quite challenging, with nationwide efforts becoming more widespread only after passage of the Clean Water Act in 2004. Progress had been slow since then, with approval of the National Sewerage and Septage Management Program (NSSMP) delayed from 2005 to 2012, and very little implementation beyond those cities supported by donor-funded projects. The focus of these projects, many of them funded by USAID, has been to help city governments and water districts develop septage management programs. In its past sanitation projects, USAID stressed the importance of developing a strong enabling environment of policies and user fees, effective and appropriate promotion campaigns and the necessary infrastructure in the form of low-cost and low-maintenance treatment technologies (See Figure

6). These are the components of the three-pronged approach adopted and used by the Be Secure Project to help its partner cities develop septage management programs.

Be Secure's work on the sanitation front was unprecedented as it achieved more than twice its LOP target of 400,000 people. Be Secure was instrumental in providing 1.04 million people with access to an improved sanitation facility and mobilized more than \$5 million for septage management programs. This achievement was due to Be Secure's technical assistance for developing septage management programs in Isabela City in Basilan, Tacloban and Ormoc Cities in Leyte, Cotabato City and Zamboanga City. Be assisted the LGUs to develop ordinances, select appropriate technology and site, prepare preliminary designs for septage treatment systems, conduct financial analysis, and implement promotional campaigns. The project also helped organize exchange visits to Dumaguete City in Negros Occidental and Metro Manila as part of its overall initiative to build capacity of LGUs to manage and implement a successful city-wide septage management program.

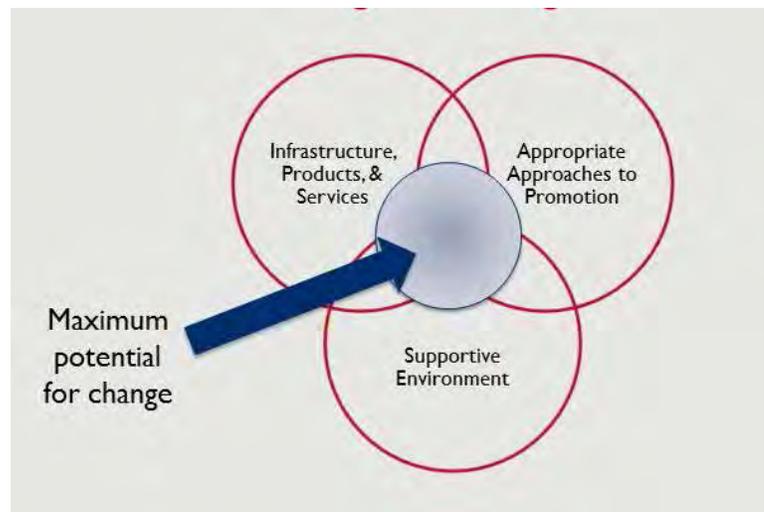


Figure 8: Septage Management Programs Approach

SEPTAGE ORDINANCES

As a result of Be Secure's technical assistance, LGUs such as CDO, Cotabato, Isabela, Ormoc and Tacloban Cities have passed and adopted landmark septage management ordinances (see Figure 7). Of these cities, Isabela and Tacloban Cities have successfully built their respective septage treatment plants. Isabela City began operating its septage treatment plant in December 2016. It is the first water district-operated septage treatment plant in Mindanao. Treated wastewater is reused to irrigate an adjacent rubber plantation owned by the water district. To operate within 2017 is Tacloban City's septage treatment plant, which replaced the temporary emergency septage treatment facility installed by another donor after Typhoon Haiyan. In partnership with UNICEF and Samaritan's Purse, Be Secure helped build the new septage treatment plant facility, which now serves as a permanent facility for treating septic wastes of the city. An added feature of Tacloban's facility is a visitor's information center to educate

“It is my deepest appreciation to USAID Be Secure for being my partner in pushing this legislation. The technical exchange and series of training that USAID organized for us helped sharpen my interest and appreciation to advance the septage ordinance and to seek support from my colleagues.”

- CITY COUNCILOR FREDDIE RIDAO, COTABATO CITY

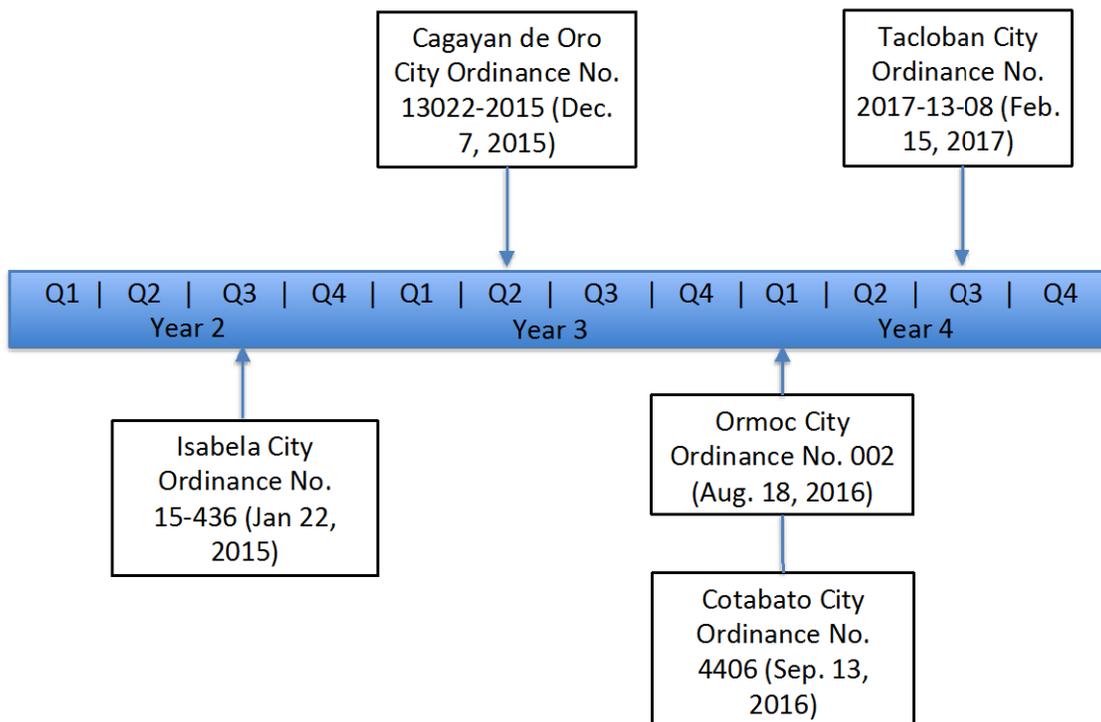
visitors on the septage cycle, and the importance of proper septage management in the context of water security and quality (see pg. 41 for more detail on the Tacloban STIP).

Some key aspects of Be Secure’s technical assistance include the operations and maintenance training on septage management at all sites as well as the exchange visits it organized to Dumaguete and Manila. The visits in particular helped the officials understand the details and see that it can be done. It was especially useful for them to see that Dumaguete achieved full cost recovery of its initial investment in five years.

As a result, Be Secure’s LGU partners were confident and committed to invest in septage management programs. Zamboanga City was among those that committed resources and with Be Secure support in developing bid documents, they made efforts to apply for government subsidy funds under the NSSMP to build a sewage-septage treatment plant.

Key to Be Secure’s success in achieving results for the sanitation sector was its assistance to its partner cities in accessing debt financing and solicit or engage private partners by helping to prepare feasibility and tariff studies, and sharing information on financing options. Be Secure’s promotion campaigns not only fostered social acceptance but also encouraged local government partners to invest and mobilize resources to establish sanitation

Figure 9: Timeline of septage management ordinances



facilities within their respective localities. The project has identified and trained a cadre of key technical people in most of the project areas who understand the need to improve septic tanks in order to meet standards as well as mandate desludging and waste water treatment.

ISAWAD WASTEWATER ENHANCEMENT FOR ENVIRONMENTAL CARE TREATMENT PLANT



ISAWAD WEE INAUGURATION

In Basilan, the Isabela City Water District (ISAWAD) inaugurated its Wastewater Enhancement for Environmental (W.E.E.) Care Treatment Plant on December 6, 2016 in Isabela City, Basilan. Dignitaries from the city government, Department of Public Works and Highways (DPWH), Local Water Utilities Administration (LWUA), ISAWAD, and the USAID Be Secure Project attended the event. The plant is the first water district-operated septage treatment plant in Mindanao. Following the inauguration, ISAWAD will complete the commissioning and testing of the facility and begin operating it in March 2017. Be Secure

played a key role in the development of Isabela City’s septage management program by providing training and technical assistance on technology and site selection, financing, tariffs, development of a local ordinance and promotion campaign, and dealing with the “not in my backyard” (NIMBY) phenomenon. After the inauguration program, Be Secure Project Climate Resiliency Team Leader Ms. Elisea “Bebet” Gozun and ISAWAD General Manager Ms. Aleli C. Almodovar were interviewed by media representatives from ABS-CBN, UNTV, Philippine Daily Inquirer and the Public Information Office about USAID and ISAWAD’s partnership and the significance of this program to Isabela City.



TACLOBAN CITY SEPTAGE TREATMENT PLANT AND VISITORS CENTER

Be Secure assisted Tacloban City in developing a city-wide septage management program. With funds from UNICEF, technical assistance from the USAID Be Secure Project, and construction management by Samaritans' Purse, the improved Tacloban City septage treatment plant (STP) was renovated turned over to Tacloban City on March 2016. Be Secure's technical assistance consisted of the design and development of the city's septage management program; development of preliminary schematic designs; support to developing the specifications and program of works



TACLOBAN CITY SEPTAGE TREATMENT FACILITY VISITORS CENTER INAGURATION

for the construction; capacity building of technical working group and CENRO staff; development of a Field Implementers Guidebook on the Construction, Operations, and Maintenance of a Lime Stabilization Treatment Facility using the Tacloban City Case Study; and coordination, oversight, and advisory assistance to CENRO office for septage management program. Be Secure also trained the CENRO to effectively operate and maintain the facility. The renovated STP can treat 25 cubic meters per day through a hybrid system technology. It will be operated by the CENRO and will benefit approximately 220,000 people.

The STP is the first city-wide septage treatment facility in the Philippines that uses lime stabilization to treat water. It is also climate-resilient, built to withstand 315 kph winds. Be Secure also assisted the city government, in particular the city environment and health departments, formulate and adopt a citywide septage management program ordinance, which was passed in February 2017. Following the turnover of the septage treatment facility in March 2016, Be Secure assisted the Tacloban City Government in developing a Visitor's Center to promote understanding and appreciation among the general public on how treating septage contributes to good health and a clean environment, and on the processes involved.



POLICY ADVOCACY & FORMULATION

141

141 improved water and wastewater treatment policies, laws, and plans were strengthened, developed, adopted and/or implemented through Be Secure

One of Be Secure’s tasks was to encourage reform in the water sector, which was hampered by the absence of a lead agency, lack of a cohesive policy framework, insufficient public financing, inadequate sector data to inform policy and investment decisions, and a severely fragmented regulatory regime. Water in the Philippines is generally defined in government by its uses (urban, agriculture, commercial, energy, etc.). Under the leadership of Be Secure’s Ramon “Dondi” Alikpala and Elisea “Bebet” Gozun, the intent of the Be Secure Project was to facilitate consultations to develop a cohesive structure around the many uses of water in the Philippines and provide key stakeholders with data, technical expertise and options for improvement. Over the project’s four years, Be Secure contributed to advancing the creation of a Water Regulatory Commission, amending the Water Code, enacting local policies in its focal areas, mobilizing financing, facilitating public-private-partnerships at the local level, and guiding the agenda for a Water Summit.

Towards the end of the project there was a heightened interest to support reforms on water and economic regulation. Following discussions with Be Secure, Senator Loren Legarda expressed interest in passing a bill through the Senate on key environmental issues related to water. Congresswoman Josephine Sato of Occidental Mindoro filed House Bill 2075 or “An Act Rationalizing the Economic Regulation of Water Utilities, Creating the Water Regulatory Commission and for Other Purposes,” on February 8, 2017. Be Secure staff met with Congresswoman Sato’s staff several times to explain the merits of the bill and to help form a Technical Working Group (TWG) and recommend members of the TWG. Be Secure developed a position paper on the WRC entitled, “The Water Regulatory Commission, Rationale for creating an independent economic regulatory body,” which was distributed to concerned members of Congress. Simultaneously, NEDA advertised a bid for consulting services to develop a Philippine Water Supply and Sanitation Master Plan. And finally, an initiative coming from the President’s Office began work on a Water Summit intended to rationalize water. This last initiative drew on the various agencies responsible for water and is expected to present to the President a draft Executive Order for key actions to be taken that would help rationalize water use. Be Secure participated in planning meetings for the summit, served as resource persons and provided advice to the conveners.

By the end of the project, Be Secure had assisted in the development, strengthening, adoption, and/or implementation of a total of 145 policies, laws and plans and 14 model actions. A significant part of these results was achieved at the local level, with LGUs fully and freely exercising political will to pass, adopt or enact policies. At the national level, reforms were continually stalled by a lack of champion in the executive branch that can work with legislators who have taken interest in water security issues.

NWRB SUPPORT TO AMEND THE WATER CODE

Through a series of consultations from 2014-2016, Be Secure supported the NWRB to amend the Water Code and make the 40-year old law more relevant and responsive to present-day challenges. The proposed amendments focused on integrating climate change considerations and water demand management; strengthening river basin governance; improving surface and ground water data collection; and rationalizing the collection of water fees by various institutions. Despite the efforts, the amendments did not progress in Congress due to lack of a legislative champion. There are also issues that need to be addressed such as: defining the role of DENR and its created councils (watershed councils, water quality management associations, protected area management councils) in the creation of river basins, rationalizing the water fees being collected by various institutions/councils, clarifying the difference

between river basins and watersheds, and easement issues. In addition, the initiative was overtaken by the 2016 elections, and the 16th Congress has come to a close.

WATER REGULATORY COMMISSION

Be Secure supported stakeholder advocacy for the passage of the Water Regulatory Commission (WRC) bill, which aims to rationalize economic regulation of water supply and sanitation services by creating an independent, quasi-judicial national body. The project provided policy advice and briefing to key decision-makers in both the executive and legislative branches of government to build their support for the bill. Be Secure inputs to the WRC bill included:

- Expanding the definition of terms;
- Defining the institutional setup of the WRC;
- Highlighting the divisions/departments from existing agencies that will be transferred to the WRC;
- Adding that the WRC will develop and maintain the national utility database;
- Amending the list of WRC commissioners and specifying their qualifications;
- Identifying conflicting provisions in other laws that will be superseded by the WRC; and
- Providing the WRC flexibility in developing fines and penalties.

SUPPORT TO LOCAL-LEVEL & NATIONAL-LEVEL COORDINATION

To assist its local partners with financing their water and sanitation projects, Be Secure helped several partners communicate and negotiate with national government agencies. Be Secure assisted ZCWD in applying for funding from DPWH through the NSSMP and also helped DPWH draft changes to the NSSMP regulations to streamline them and expand their scope to include septage management projects for funding. In July 2017, the NEDA Board approved the revised NSSMP regulations, allowing the national government to provide 50% cost share not just for sewerage but also for septage management and expanding the eligible LGUs from the 17 highly urbanized cities to all cities and first-class municipalities. With this positive outcome, DPWH has started working with CDO on the septage treatment facility that Be Secure helped develop over the past two years. Be Secure also helped increase financing for water by getting the Zamboanga impoundment dam onto NEDA's list of priority infrastructure projects. Be Secure's work in implementing the pre-feasibility study for this dam, drafting of the terms of reference and presenting the options to NEDA's infrastructure committee were key to this development.

Finally, Be Secure made an important contribution to improving NEDA's Joint Venture guidelines for private sector participation in water and sanitation by identifying weaknesses in the guidelines and making specific recommendations to improve the process. This was based on Be Secure's experience in providing MIWD with transactional advisory services and was shared with NEDA and to the PPP Center, both of which appreciated the projects' inputs and will make use of the recommendations. With better PPP regulations in the future that were informed by Be Secure's experience and recommendations, the evaluation process 60 or more PPP applications will improve, ultimately protecting interests of both consumers and water districts.



INTERMEDIATE RESULT 2: INCREASED RESILIENCE TO CLIMATE-RELATED STRESS AND HYDROLOGICAL EXTREMES

CLIMATE-RELATED DATA FOR FORECASTING & PLANNING

CCA/DRR PLANNING

4 LCCAPS approved
7 LDRRMPs approved
9 Enhanced CLUPs
1 Enhanced Provincial
Physical Framework &
Development Plan

HYDROLOGICAL RISK ASSESSMENTS

With the increasing magnitude of hydrological disasters being attributed to climate variability, Be Secure conducted hydrological risk assessments in CDO, Iloilo, Tacloban and Zamboanga cities to establish baseline risk and measure reduction in risk from the baseline over the period 2013-2016. The reduction in risk could be attributed to various interventions by the national government, local government, Be Secure, other donors and NGOs. This assessment was not intended to measure Be Secure's specific technical efforts since many of the variables used to measure risk included items that were not in Be Secure's mandate.

Be Secure subcontractor Woodfields used a four-step scientific methodology (which was validated by the local stakeholders) to do this risk assessment. First, they chose five climate hazards (flooding, drought, strong winds, rain-induced landslides, and storm surge); then they identified the elements exposed to these hazards (lives, health, livelihood, assets and services); then they determined the likelihood of these hazards affecting the exposed and vulnerable elements ranging from probable to rare; and lastly, they estimated the extent of the impact on the various elements ranging from catastrophic to insignificant. They placed all of these elements in a risk register matrix that was color-coded. The study was conducted using a highly participatory method to ensure inclusion of all risks. Using the outputs of MO and GFI as well as other scientific data and information from various government offices, they determined the baseline risk of the six elements within a city to the five climate hazards as of 2013 when the Be Secure project started. For each hazard, a series of maps was generated to reflect pre-2013 baseline impact and risk conditions. Using a highly participatory process, they identified the various adaptation measures that had been done from 2013 to 2016 to determine the change in the hydrological risk of the city in that three-year period. The objective was to qualitatively determine a reduction of risk levels across the defined geographic regions due to adaptation and mitigation measures undertaken.

The results showed that there was a general reduction in risk from the baseline in most of the hazard-susceptible areas of the four cities. This was mainly due to the “soft” measures (climate training, ordinances, regulations, etc.) undertaken from 2013 to 2016 by Be Secure and other organizations. The risks that remained were primarily due to inadequate infrastructure that is vital to addressing climate risks. For example, in Zamboanga, the risks to life, livelihood and services remained high, and will remain high as long as the planned impoundment dam is not constructed to ensure the city’s long-term water security. Similarly in CDO, the risk to flooding will remain until the canal is reinforced to prevent flood waters from reaching the city. These are infrastructure issues that are outside of Be Secure’s and would need Philippine Government support. Nevertheless, the value of this exercise is that it helped city decision-makers and planners prioritize what actions are needed and where they should be implemented in the city to reduce their risk to specific climate hazards.

Although Be Secure’s target for this indicator was a 38% reduction in risk compared to the baseline, the results from the four cities could not accurately be translated into an average across all hydrological hazards, vulnerable elements and cities. Therefore, we have not reported a numerical result for this indicator. The detailed results for each city are included in the final hydrological assessment report, which was submitted to USAID, and distributed to our partners and beneficiaries.

LASTING RESILIENCE TO HYDROLOGICAL HAZARDS IN CAGAYAN DE ORO



MOVING A WATER CISTERN IN CAGAYAN DE ORO

The city of Cagayan de Oro has been frequently affected by multiple hydrological hazards, often with different and varying impacts on local populations. The most recent of these hazards include Typhoon Sendong (international name Washi) in December 2011, followed by Typhoon Pablo (international name Bopha) of lesser degree in December 2012. Across Cagayan De Oro, most climate resiliency assistance programs consist of “soft” measures, to which Be Secure significantly contributed. Project assistance includes: information and education campaign by various agencies; enhanced weather monitoring systems by PAGASA; climate considerations incorporated in the LCCAP and LDRRM Plan; early warning systems, evacuation programs and emergency

response management through the LDRRM and local media; programs on crop rotation by the LGUs; access to insurance; and water efficiency and conservation programs. A few “hard” or concrete measures were in place, such as: relocation of critical equipment to higher grounds, use of submersible pumps and continuous improvement of distribution systems undertaken by COWD; flood control infrastructures in some areas both by the City LGU and the DPWH; declaration of some areas as “no build zones” and relocation of affected communities from high-risk areas by the City. Some of the measures date back prior to 2013 as the national and local government agencies have embarked on reducing the disaster risk to vulnerable populations. One case in particular is Isla De Oro and adjacent flood-prone areas that were identified as high risk areas after Sendong. A relocation program for its former residents was implemented and the affected areas reclassified as recreational and open spaces.



CLIMATE RESILIENCE CAPACITY BUILDING

While providing our partners with scientific data, information and tools was useful and important, it was not enough. It is crucial that they understand how to interpret and use this information and tools so they can continue to use them and update their risk matrices and maps and calibrate their plans accordingly. To achieve this, Be Secure conducted a total of 144 training sessions for our key local partners including the academe and the local communities.

Overall, Be Secure conducted a total of 1,984 hours of training on CCA/DRR and has trained 2,854 men 1,882 women. This resulted in increased capacity of 2,002 stakeholders (1,069 men and 728 women) and 154 institutions to adapt to the impacts of climate change since the beginning of the project. In addition, more than half (58%) of these stakeholders reported to have increased their knowledge of climate change impacts and response options while more than a quarter of the total number used climate information in their decision making.

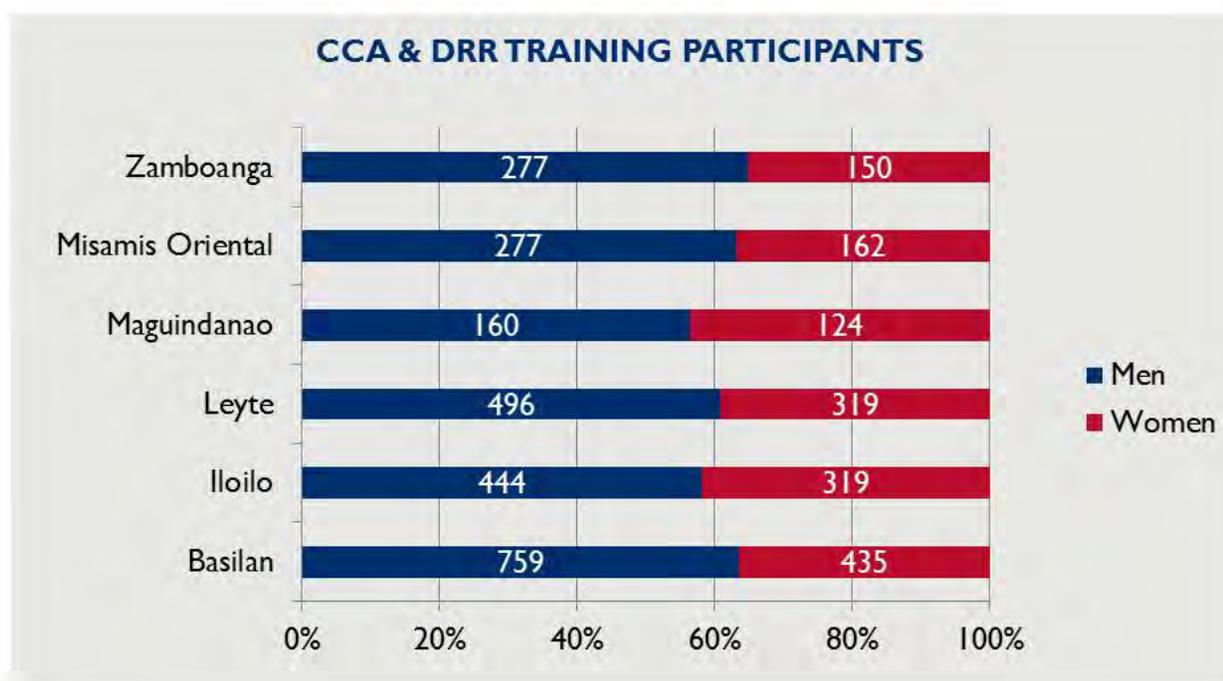


Figure 10: Gender Composition of CCA & DRR Trainees

Be Secure encouraged women to attend and fully participate in the project's training and workshops, although men accounted for 60% of total participants. This is largely because most participants from the LGUs, especially in Mindanao, were men. However, the percentage of female participants in CCA and DRR trainings steadily increased from 2013 to 2017. Notably, four of the six water districts that the project worked with were led by female general managers (CDO, Isabela City, and Metro Cotabato), while three of the six partner cities were headed by women (Tacloban, Isabela and Zamboanga Cities). Be Secure's implementation of capacity building programs in CCA/DRRM, IWRM, weather forecasting and twinning partnerships either at the national or local levels helped improve their capacity to address climate change issues.

PAYONG PAGASA

As a part of its effort to build resilience to climate impacts, Be Secure helped the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), the country's national weather agency, improve its capacity to disseminate weather information to the public. Engaging J. Walter Thompson, Be Secure helped PAGASA redesign and launch a simplified information system called "Payong PAGASA" as well as develop simplified weather/climate forecasts and informational materials. During PAGASA's 150th anniversary held in March 2015, it launched *Ella the Umbrella* as its new mascot and new corporate branding. PAGASA and Be Secure jointly conducted field tests to ensure that the new designs were well received by both PAGASA staff and the general public. Building off on "Payong PAGASA," Be Secure developed several different information materials, including posters, brochures, flyers, and displays, which were eventually distributed widely to partner organizations at the national level, and within the provinces. These materials explained topics such as El Nino and La Nina; warning systems for tropical cyclones, rainfall and flood; as well as farm weather and seasonal climate forecasts.



BE SECURE STAFF WITH PAGASA STAFF AT THE PAYONG PAGASA LAUNCH

WHAT IS A TROPICAL CYCLONE?
 AN INTENSE LOW PRESSURE SYSTEM OF AT LEAST 30 KPH MAXIMUM SUSTAINED WINDS - ALSO KNOWN AS "BAGYO"

CLASSIFICATION OF TROPICAL CYCLONES
 A tropical cyclone is classified according to its strength and grouped according to the maximum sustained winds near its center.

TROPICAL DEPRESSION	TROPICAL STORM	SEVERE TROPICAL STORM	TYPHOON	SUPER TYPHOON
61 kph or less	62-88 kph	89-117 kph	118-220 kph	more than 220 kph

TROPICAL CYCLONE WARNING SYSTEM SIGNALS (TCWS)

TCWS NO. 1	TCWS NO. 2	TCWS NO. 3	TCWS NO. 4	TCWS NO. 5
WIND IMPACT No damage to very slight damage	WIND IMPACT Light to moderate damage	WIND IMPACT Moderate to heavy damage	WIND IMPACT Heavy to very heavy damage	WIND IMPACT Very heavy and widespread damage, destruction
LEAD TIME warns 36 hours	LEAD TIME warns 24 hours	LEAD TIME warns 18 hours	LEAD TIME warns 12 hours	LEAD TIME warns 12 hours
OPEN SEA CONDITION 1.25-4.0 meters	OPEN SEA CONDITION 4.1-14.0 meters	OPEN SEA CONDITION more than 14.0 meters	OPEN SEA CONDITION more than 14.0 meters	OPEN SEA CONDITION more than 14.0 meters

THE HAZARDS OF TROPICAL CYCLONES

- HEAVY RAINS / FLOODS**
 - HEAVY RAIN CAN CAUSE FLOODING AND DAMAGE TO AGRICULTURE.
 - DRINKING WATER MAY BE CONTAMINATED. THIS MAY LEAD TO THE OUTBREAK OF DISEASES.
- STRONG WINDS**
 - WIND SPEED MAY EXCEED 250 KPH.
 - ITS FORCE WILL CAUSE SEVERE STRUCTURAL DAMAGE.
- STORM SURGE / COASTAL FLOODING**
 - STORM SURGES CAN FLOOD LOW-LYING COASTAL COMMUNITIES.
 - THESE CAN DESTROY NATURAL AND MAN-MADE STRUCTURES, ESPECIALLY WHEN IT IS HIGH TIDE.
- LANDSLIDES / MUDFLOWS**
 - MOUNTAINOUS AREAS, ESPECIALLY THE STEEP SLOPES, ARE PRONE TO LANDSLIDES.
 - LANDSLIDES AND MUDFLOWS CAN BURY PEOPLE ALIVE AND DESTROY PROPERTIES.

TROPICAL CYCLONE WARNING SYSTEM LEAFLET DEVELOPED BY JWT & BE SECURE FOR PAGASA

CCA & DRR TWINNING PARTNERSHIPS

In addition to trainings, a more effective approach used by Be Secure in building capacity was twinning, more commonly known as mentoring. This approach involves mentors guiding their mentees step by step and encouraging them to learn by doing.

The Albay Provincial Safety and Emergency Management Office (APSEMO) served as the mentor for the Province of Leyte, the municipality of Palo and Barangay Tacuranga, Palo. APSEMO shared its experience to implement its DRR program to improve the capacity of the mentees to reduce risk from hydrological and geological hazards. APSEMO mentored the LGUs on reviewing DRR operations manual, setting up the office and putting in place the requirements for an effective DRR office. As a result of this mentoring, Leyte had zero casualties from Typhoon Ruby in 2014 more importantly, had continued to do so even beyond the mentoring program. With casualties prevented, the confidence and trust of local residents in their respective LGUs have grown.

In the same manner, the Florida Water and Climate Alliance (FWCA) served as the mentor for the six water districts Be Secure worked with. They mentored them in preparing their vulnerability assessments (VA) using the MO produced maps and the GFI findings. They provided the water districts with a VA matrix which the water districts used to determine the vulnerability of various aspects of their operations. FWCA also helped the water districts use the output of this VA exercise as basis for them to update their business plans to make sure that measures needed to build climate resiliency are planned for and budgeted over time. Lastly, they also mentored them on preparing their emergency response plans (ERP) to guide their actions when responding to a disaster. Both the climate-resilient business plan and the ERPs have been officially adopted by the respective boards of these water districts. Because of this twinning, water districts are now better able to reduce and manage their risks from natural disasters.



WD & LGU TWINNING PARTICIPANTS IN SEATTLE

Lastly, Seattle Public Utilities mentored the cities of Iloilo, CDO and Zamboanga and their respective water districts to better forecast demand and identify appropriate water conservation and efficiency measures, as well as design and roll out educational campaigns. They now hope to manage water supplies to last longer and serve more people without having to build expensive infrastructure. Consumers will experience greater water efficiency in their homes, savings on water bills. The utilities have designed education campaigns to reinforce conservation at school, in businesses and malls and at home. In addition, Iloilo City passed an

ordinance creating the Water Efficiency and Conservation Council and Zamboanga City is studying the possibility of passing a similar ordinance.

WATER DEMAND MANAGEMENT

The introduction of WDM was a programmatic innovation of Be Secure to its focal cities and national agencies to combat present and future water scarcity. It was prompted by the severe El Niño that the country experienced from the latter part of 2015 through early 2016. In Zamboanga, water stress manifested itself in diarrheal disease episodes and in rationing that began even earlier than usual and brought hardships to many in the city. Reducing water use especially during times of scarcity by promoting water conservation has been the traditional solution in the Philippines to enable water providers to allocate limited supply to various users. However, given the anticipated changes to the climate in the near and far future and the rapid growth of the population putting increasing pressure on water systems, simple water conservation is not nearly enough. It is important to make the most of the water that the Philippines has, not just as a short-term response to scarcity but also as a long-term response to climate challenges to water security.

Be Secure brought in experts from areas that had faced major water shortages (California, Jordan and Australia) to share their experiences and make recommendations. Many people in the Philippines, despite the summer rationing, still felt there was adequate water from rainfall. The forecasts of Manila Observatory clearly showed that they needed to rapidly change their frame of reference. Mindanao was expected to have much higher temperatures (between 2 and 4 degrees Celsius) and lower rainfall. At the same time, population growth and the demands that come with it, made it imperative that water districts and LGUs begin to rapidly plan for future shortages.

Within a very short time, Be Secure raised awareness about WDM not just with local partners but also with key agencies such as DPWH, DENR, NWRB and NEDA. WDM thus found its way into the proposed amendments of the Water Code, is mentioned in the recent Philippine Development Plan of the Duterte administration and in the work plan of the NEDA Infrastructure Committee. At the local level, it has also been incorporated in the CLUPs of our focal areas mentioned above. Be Secure's WDM program snowballed after senior staff from LGUs and water districts visited Seattle as part of a twinning activity to learn the way Seattle had managed its water efficiency program. The WDM concept then spread to water districts that were not part of Be Secure through the activities of PAWD. Specifically, PAWD trained other water districts using the Be Secure partner water districts from the CDI cities as trainers.

Some of our academic partners, namely Central Philippine University in Iloilo City, Xavier University in CDO and Western Mindanao State University in Zamboanga City, have also realized the value of WDM. They have thus integrated WDM into the curricula of their various courses starting with the engineering departments and at least one, WMSU, has already established water harvesting systems. This adoption by universities will ensure that the country will have students and graduates who understand that water has to be effectively managed if we are to achieve water security. They can serve as WDM champions in their localities.

“The WDM program, started by Be Secure, shall be among our flagship projects with planned expansions to integrate public education and policy advocacy to teach every water user the efficient use of the limited water supply. The Water Audit program will be enhanced by extending its scope to regional and national organizations through trainings by our very own Zamboanga Water Audit Team.”

**- LEONARDO “CHITO”
VASQUEZ,
ZCWD GENERAL MANAGER**

INTRODUCING WATER AUDITING TO THE PHILIPPINES

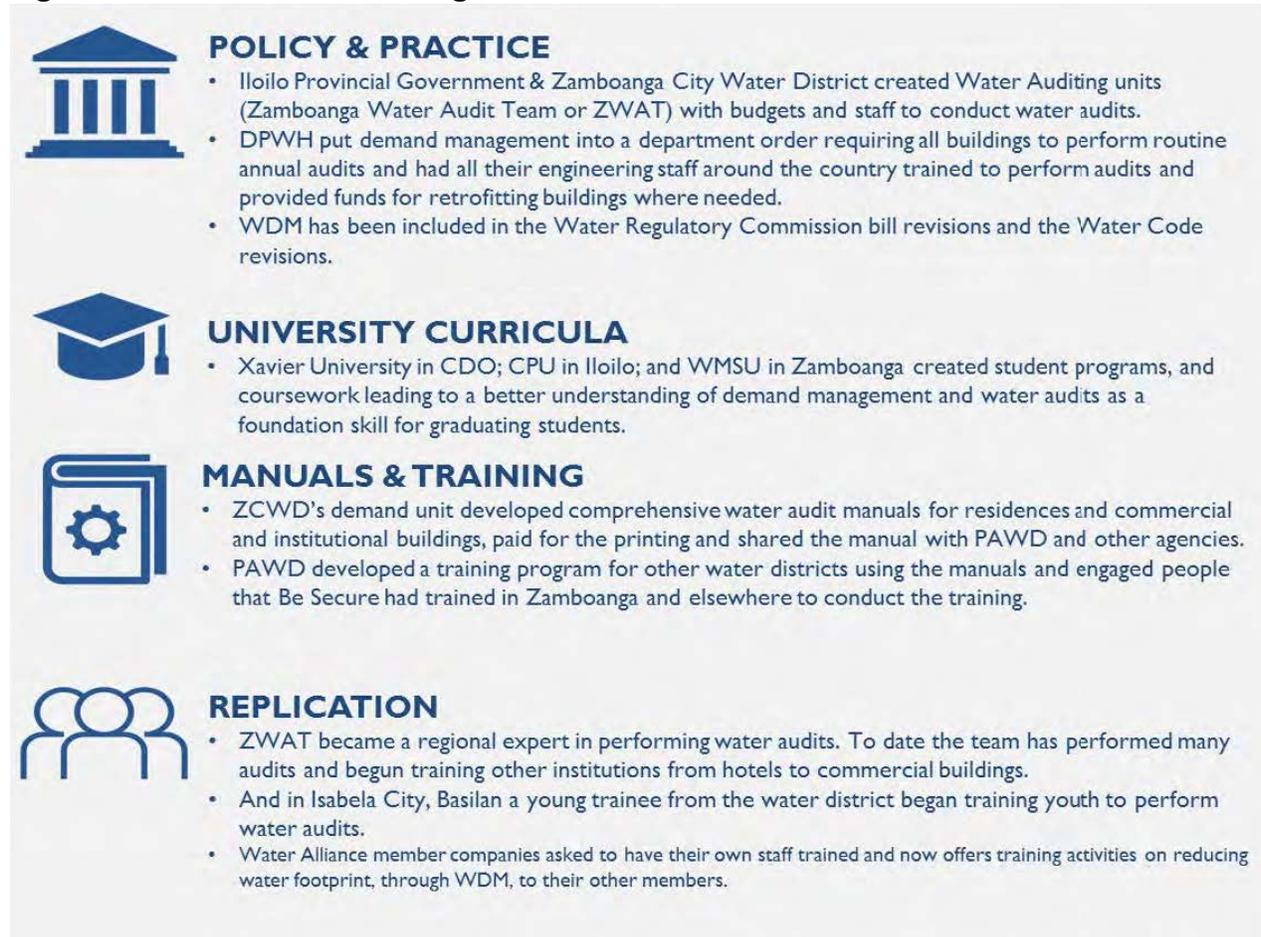
While national level decision-makers were impressed by the experiences of Los Angeles, Melbourne and Sydney in making their water systems more efficient, in the field they required a more direct and practical approach. Be Secure provided it by teaching a cadre of people from the water districts, local universities and LGU staff how to conduct a water audit to assess how much water is actually being used in different parts of a house, an office or a company and the amount that could be saved. Water audit trainings were conducted in Iloilo, Tacloban and Zamboanga and for government agencies such as DPWH and GSIS. The simplicity of the rapid water audit and the obvious amounts that could be saved proved galvanizing that it prompted some of Be Secure's partners to take concrete actions. ZCWD even created a unit to support water efficiency with a budget of \$57,572, trained some 10 engineers to perform water audits and produced two toolkits for water auditors in collaboration with Be Secure – one for the residential sector and another one for commercial and institutional sectors. These were pre-tested and used in training technical staff from all the regional and district offices of DPWH.



WATER AUDIT IN CDO

In 2015, the Philippines experienced a dramatic El Niño, bringing with it drought for much of the country and a foretaste of the scorching temperatures that might be expected from the future effects of climate change. To address these challenges, Be Secure started by bringing to the Philippines experts from areas faced with more extreme water shortages: Australia, California and Jordan. Be Secure then trained city government, water district and university staff to perform a simple water audit, which is the foundation activity of a larger WDM strategy. In the water audit, professionals discovered how much water could be “saved” if only systems were more efficient and pipes/toilets and faucets did not leak. Once these staff discovered a) how easy it was to conduct a rapid water audit, and b) how much water could be saved, the idea spread rapidly. While Be Secure put very little USAID money into this effort, the project watched and shepherded the process. The concept of WDM has now spread in Be Secure's partner cities and the project has taken it even further by introducing other aspects of demand management from demand forecasting to NRW reduction, all to ensure that the little water that already exists is used well. The power of a single idea, at the right time, shared with wisdom and insight, borne out of the concern Be Secure water staff sincerely felt for residents in our geographic areas has now become a well-accepted program by progressive and dynamic partners of Be Secure.

Figure 11: Water Demand Management & Water Audit Results



RAIN WATER HARVESTING

Since WDM also includes the use of appropriate water quality for the intended use, it also promotes rainwater harvesting, storage and use as well as the re-use of treated wastewater, which is allowed in the Clean Water Act. Be Secure promoted capture of rainwater runoff both as a way of minimizing flooding during the storm season and to collect water for future use. While grey water can be used primarily for outdoor usage, it can substantially add to the ability of a water district to service its area through use of grey water for non-potable uses such as in firefighting, street cleaning and urban landscaping. As a result, Iloilo allocated \$1.16 million for construction of rainwater harvesting systems in schools and public buildings, reducing the use of drinking water for washing, flushing, or gardening. And DPWH allotted more than \$1.1 million in funding for rainwater collection systems.

A template ordinance on rainwater harvesting was developed by Be Secure and is being used as a reference by Iloilo City, CDO, Zamboanga City and Cotabato City to draft their own local ordinances. In addition, DPWH is providing Zamboanga City some funding for the establishment of a rainwater harvesting system in the city hall and adjoining offices. In the same manner, DPWH in Cotabato is also funding the rainwater harvesting system of some schools in the City and a rainwater harvesting and grey water collection system was designed by Be Secure at the request of the Governor's new Offices in Buluan, the regional capital of Maguindanao. As mentioned above, Be Secure's rehabilitation of schools and clinics in Maguindanao already includes rainwater harvesting systems as a modest add-on cost.

DISASTER RESPONSE AND RISK REDUCTION

CLIMATE-RESILIENT REPAIRS IN LEYTE



8 Municipal Water Systems



17 Schools



3 Health Clinics



1 Hospital

In November 2013, Super Typhoon Yolanda struck the nation, causing massive property damage, loss of life, and displacement of thousands of families. USAID decided to focus its disaster recovery efforts on Leyte Province, where much of the worst damage was concentrated. USAID directed Be Secure to help repair and rehabilitate damaged water supply facilities. Together with the Local Water Utilities Administration (LWUA), Be Secure identified over 100 water facilities that had been damaged during the storm and subsequent to it as the public, desperate for water, broke pipelines and facilities to get potable water that could no longer be pumped when electrical power was totally disrupted. The storm damaged springs, above-ground and shallowly-buried pipelines and those traversing rivers, pump and generator sheds, and electrical systems.

CLIMATE RESILIENT REPAIR AND IMPROVEMENT OF TYPHOON-DAMAGED WATER SYSTEMS

Be Secure assisted eight municipal water systems to repair and rehabilitate their damaged water systems (the water districts of Baybay, Carigara, Kananga, San Miguel, Isabel, Mac Arthur, Hilongos and Ormoc City) that benefited 275,241 people. Be Secure also repaired water systems for 17 schools and four health facilities that provide services to approximately 26,298 people.

The damage in Leyte and Tacloban city was so extensive at the time that supplies were hard to come by (one international agency bought all the cement available including factory supplies), making it difficult for organizations who were not involved in the initial emergency to obtain the supplies needed to make repairs. Prices for commodities soared, and contractors and skilled laborers became scarce. Nevertheless, the project was able to support facilities identified as needing repairs, make them operational again and, at the same time, respect USAID regulations on environmental compliance. Be Secure had no issues and was commended by USAID for its adherence its environmental compliance standards.

Under the guiding principle of “build back better,” Be Secure incorporated climate-resilient features into the designs so the systems will be better able to withstand future hydrological hazards such as strong typhoon winds, flooding and landslides.



NEWLY CONSTRUCTED OVERHEAD WATER TANK AT CASSIDY ELEMENTARY SCHOOL IN CARIGARA



KANANGA WATERWORKS

To do this, the project used the studies conducted by subcontractor Manila Observatory to downscale climate change forecasts, which showed that Tacloban was likely to experience wetter wet seasons, more forceful and intensive rains, and potentially higher winds and more landslides. The repairs undertaken insured that all pipes were buried in cement and no longer vulnerable to displacement, that buildings and water reservoirs were able to withstand winds of up to 350 kph. The information was also used to select the best sites for water supply infrastructure. Be Secure developed the *Climate-Resilient Water Infrastructure: Guidelines and Lessons from the USAID Be Secure Project* to share our experiences in Leyte with others interested in incorporating climate-resilient measures into water infrastructure.

Water systems adversely affected by typhoons and/or flooding had to be rehabilitated and built back better – meaning they had to be made climate-resilient. This included using geo-hazard maps as reference in the siting of facilities to avoid locating them in high risk areas and making sure that structures could withstand stronger winds. The team also made use of the climate change projections prepared by MO in determining river discharges for water sources, for long-term mitigation measures such as projecting flood levels and river discharges as well as for the hydrology study to build an impounding dam for Zamboanga City.

Be Secure’s also supported septage management in collaboration with other development agencies following Typhoon Yolanda. With septic tanks flooded and the city’s lacking in a permanent septage treatment facility to treat accumulating septic wastes from shelters, taking care of sanitation became a Be Secure priority.

ACTIVITY CORNERSTONES

DOWNSCALED HAZARD, CLIMATE, & RISK INFORMATION

Recognizing that the impacts of climate change differ in different parts of the country and that in order to reduce risk to climate impacts, one needs scientific data to understand the climate hazards and the extent of their likely impacts on your area and/or operations. Be Secure tapped the Manila Observatory (MO) to downscale the climate projections to 4 of our 6 focal areas, namely Tacloban, Iloilo, Cagayan de Oro and Zamboanga. Using industry-standard and multiple models and methods to verify results, MO produced quality output that that informed every other piece of work undertaken by Be Secure. Their findings showed the changes in the rainfall and temperature of these cities (broken down per barangay) in the near term (2025) and the medium term (2050). These findings were translated in GIS-based climate hazard maps.

These MO outputs served as the cornerstone for all the work that was done in identifying vulnerabilities to climate hazards and risks and in identifying needed actions to build climate resiliency of both the LGUs and the water districts. These then served as the basis for the vulnerability assessment of their water resources which was done by Geosciences Foundation Inc. (GFI). The findings of GFI were then used as reference by the Water Districts in preparing the vulnerability assessment of their entire operations – including their treatment and distribution systems. They were also used by MO in developing the GIS-based climate risk maps by overlaying the VA results with the population of the area, the groundwater recharge areas and the service area of the concerned water districts. In turn, all these were used by the LGUs in evaluating their own vulnerability to climate hazards and subsequently in updating/enhancing their LDRRM Plans and their LCCAPs.

Providing our local partners with these city-specific scientific information and tools (the GIS-based climate hazard maps and climate risk maps) was critical to them having a better grasp of the extent of the challenges which they face or may face and subsequently in identifying the appropriate adaptation measure. This would ensure that there would be no mal-adaptation policies or actions taken.

IR2 also commissioned Woodfields Inc. to undertake the hydrological risk assessment of these same 4 cities. Woodfields used a four step scientific methodology (which was validated by the local stakeholders) to do this risk assessment. First was to identify the 5 climate hazards to be covered (flooding, drought, strong winds, rain induced landslides, and storm surge); next they identified the elements exposed to these hazards (lives, health, livelihood, assets and services; they then determined the likelihood of these hazards effecting the exposed and vulnerable elements ranging from probable to rare; and lastly, the extent to the impact on the various elements ranging from catastrophic to insignificant. They placed all of these elements in a risk register matrix which was color-coded. Using the outputs of the MO and GFI as well as other scientific data/information from various government offices, they then determined the baseline risk of the 6 elements within a city to the 5 climate hazards as of 2013 when the project started. The results of the risk register were reflected in a color-coded GIS-based map.

Using a highly participatory process, they then identified the various adaptation measures that had been done from 2013 to 2016 to determine the change in the hydrological risk of the city in that 3-year period. The results of this hydrological risk assessment showed where the remaining high risk areas of the city are and helped the city decision-makers and planners to prioritize what actions were needed and where they are to be implemented in the city to lessen their risk to specific climate hazards. In the case of the Be Secure project, it helped us determine the extent of the risk reduction that has been achieved from the time the project started.

CAPACITY BUILDING & KNOWLEDGE/BEST PRACTICES EXCHANGE

Providing our partners with scientific data/information and tools was very important but is definitely not enough. It is crucial that they understand how to interpret and use these scientific data/information and tools so that they can then continue to use them and update their risk matrices and maps and calibrate their plans accordingly. IR2 thus conducted many training sessions (a total of 144 during the life of the project) with our key local partners including the academe and the local communities. See attached list.

Perhaps no technical area needed as much capacity building as climate change. As a cornerstone of all Be Secure activities, once the research results and the forecasts were made available through a subcontracted arrangement with MO, a fundamental imperative was to: a) expose as many people as possible in short training sessions, to the impacts expected in their geographical areas and provide them a range of tools to deal with them (non-formal training) b) train a more limited number of professionals with direct responsibility over mitigating and preventing those impacts in the public arena, over a long period of time (formal training) and c) set enabling conditions and provide specialized materials that allowed a larger number of people to understand and appreciate their potential roles and responsibilities in developing resilience and implementing adaptation measures. These three, all with the ultimate goal of making the Philippines and its citizens more resilient to the negative impacts of climate change on water, formed the core strategy of Be Secure's climate change capacity building program but also informed the water access strategy.

TWINNING PARTNERSHIPS

The Albay Provincial Safety and Emergency Management Office (APSEMO) served as the mentor for the province of Leyte, the municipality of Palo and Barangay Tacuranga, Palo in sharing their experiences in disaster risk reduction and management which has built their capacity and enabled them to reduce risk (not just from hydrological hazards but from geologic hazards as well) to precisely prevent a disaster from occurring. This included the review of the operations manual and physical set up and requirements of an affective DRRM office. As a result of this mentoring, Leyte had zero casualty from the typhoon which hit them soon after the mentoring ended. More significantly, they have continued to suffer no casualty up to now. This has in turn built the confidence and trust of the local stakeholders on their government.

In the same manner, the Florida Water and Climate Alliance (FWCA) served as the mentor for the 6 Water Districts we were working with under the umbrella of the Philippine Association of Water Districts (PAWD). They mentored them in preparing their vulnerability assessments using the MO produced maps and the GFI findings. They provided the water districts with a VA matrix which the water districts used to determine the vulnerability of various aspects of their operations. FWCA also helped the water districts use the output of this VA exercise as basis for them to update their business plans to make sure that measures needed to build climate resiliency are planned for and budgeted over time. Lastly, they also mentored them to prepare their Emergency Response Plans (ERP). Both the climate- resilient Business Plan and the ERPs have been officially adopted by the Boards of these WDs. They use the Business Plan in preparing their annual work plans and budgets while the ERP is their template to respond to any likely hazard. The enabled water districts are now better in a better position to reduce and manage their risk.

Lastly, the Seattle Public Utilities (SPU) also mentored the cities of Iloilo, Cagayan de Oro and Zamboanga and their respective water districts in developing their Water Demand Management Programs. This has resulted in Iloilo City passing an Ordinance creating the Water Efficiency and Conservation Council. Zamboanga City is also now studying the possibility of passing an Ordinance to promote water efficiency and water conservation.

WORKSHOPS AND TRAINING

COMMUNITY OF PRACTICE:

Early in Be Secure's term of operations a cadre of officials in cities and towns were identified as being key to ensuring the safety of the larger community. Composed initially of water district decision-making staff and later supplemented with members of the municipality staff, this core group received sustained and long-term capacity building technical assistance from experts, both in-country and virtually by internet. The experts themselves had been practitioners and had developed resilience measures successfully in their own communities. The objective of these formal training sessions was to expose Filipino participants to strategies that had been tried and had been successful in other areas, and then adapt, plan and implement similar strategies for the benefit of their own communities and institutions. Using twinning, where an experienced set of practitioners from one area would mentor and provide in-classroom training (formal training) followed by a practicum period, allowed for greater learning to take place. Each geographic area was able to compare their strategies and budgets over time, with others in the Philippines, share ideas and learn about their own weaknesses. Formal objectives, lesson plans, and relevant handouts and power-points supplemented by discussion and consultation were the principal teaching methods. Pre-and post-test results of each session, and peer consultation sessions allowed both the participants and the trainer to evaluate the learning taking place. Finally the completed plans and their passage by relevant local authorities showed that the participants were able to promote their efforts convincingly, adapt the plans when needed on their own (CDO), and in turn ensured that mitigation and adaptation measures, (the long-term objective), had indeed taken place. The twinning partners in the above were the Florida Water Alliance, both in the Philippines and in the US, and the Albay Province in Manila. In addition the Seattle Water Utility provided additional training, both in the Philippines and in the USA. A reference Guide developed by the Florida trainers was a final outcome of the three-year training program and allowed other cities with similar issues to follow the path used by the Be Secure city partners.

NCAR TRAINING OF PAGASA EXPERTS:

Similar to the above, NCAR provided long-term training over three years, both in the US and in the Philippines, to key PAGASA climate forecasting staff using a mix of theoretical training and hands-on activities. NCAR software had been provided to PAGASA to make the electronic forecasts functional and allow the trainees to develop the necessary skills to use software for climate modeling purposes. These were highly specialized formal training opportunities, and needed more one-on-one methods to be fully understood and skills transferred.

WATER AUDIT TRAINING:

Consultant Val Pape provided direct skills training to the Zamboanga Water District staff in first physically conducting water audits and then developing theoretical and practical training materials for water audits as the principal learning tool for other water utilities. Using a mix of in-depth in-country formal training, and virtual training and support, her method produced a truly sustainable cadre of experts in Zamboanga who have gone on to train others.

SANITATION OPERATIONS AND MAINTENANCE TRAINING:

Be Secure provided a number of non-formal training sessions to relevant staff of municipal sanitation and health departments responsible for the maintenance and operation of septage facilities. These skills training activities, held over a number of days in relevant localities, were intended to ensure that septage programs, once installed, would be correctly managed, monitored and maintained. This was an important component of septage capacity building as it



alerted potential managers of issues and concerns that could be avoided with proper planning (budgeting, sludge pick-up and truck operator training, chemical needs, mixing needs, days required for evaporation etc.), as well as the regulatory mechanisms necessary to get the process approved. Through exchange visits to an existing facility, Be Secure was able to demonstrate to those who oppose and criticize septage systems the social and environmental benefits of treating septage within the locality.

WATER SYSTEM DEVELOPMENT, WELL MANAGEMENT AND RING FENCING TRAINING:

Technical training was also provided to a variety of partners involved in the development of new water sources for small water providers. These trainings were conducted by Be Secure staff as non-formal skills training. While they were intensive in their implementation, the training sessions were not long-term once trainers were satisfied that critical skills had been learned. Often provided in tandem with the training for the Salintubig program the ring-fencing trainings were offered in Leyte, Basilan and in Iloilo to staff of municipal CENRO as well as staff of small water providers. One advantage of the Salintubig programs was that the impact of the training could be objectively checked by randomly inspecting the sites of the trainees, but more importantly through DILG lists of the communities who had gone on to receive funding from DILG. Only those small water providers who had proactively and correctly provided the plans and designs using Be Secure materials were able to receive funding.

ESR AND EMMP TRAINING:

To ensure that Be Secure was in compliance with both USAID and Philippine Government environmental laws, Be Secure provided training to partners in conducting ESR's and completing EMMP's for all relevant infrastructure activities. Over time these were developed by subcontractors themselves ensuring that the concept of sustainable environmental management was being transferred to these private sector groups. Be Secure monitored results of all its subcontractors to ensure that EMMP's were being adequately implemented. A US Environmental specialist was provided as expert trainer for this work and supported it both in-country and virtually. This virtual support and assistance method has been used effectively during Be Secure's tenure and might be encouraged in future capacity building activities.

STRATEGIC COMMUNICATIONS

COMMUNICATIONS AS PUBLIC RELATIONS

Be Secure created real partnerships with the media to extend and enhance our impact. Journalists were invited to all functions not just to get media coverage, but also to educate them and create a cadre of media experts who could promote the messages. As a consequence, Be Secure received good media coverage and did not pay journalists, except for the occasional transportation reimbursement. Be Secure also encouraged its partners to create their own relationships with local media. Be Secure organized learning forums and roundtable conferences with media professionals on WDM, water security and climate change and a Media Forum held in February 2017. During the forum, Be Secure launched a handbook called “Reporting on Water Security: A Guide for Journalists” that explained the nexus between climate and water.

During the life of the project, national and provincial newspapers and online news websites published 140 news articles on Be Secure’s activities, reaching both local and international audience. This media exposure leveraged about Php 2.2 million (around \$43,000) in total ad value, which is the cost of advertising space that the articles occupied in the papers and online. On radio and television, Be Secure team leaders appeared in three major national TV news network shows based in Manila and talked about water security, WDM and climate resiliency. In addition, Be Secure activities, short interviews and events were featured several times on seven major national and provincial TV news network shows and on news programs of more than six radio stations in Manila and in the focus areas.

Several global USAID online magazines featured articles about Be Secure during the last two years of the project. Global Waters, a USAID/Washington magazine, published three articles on wastewater management, WDM and an article on water heroes featuring COWD’s general manager. Exposure, USAID’s online photo essay platform, featured Be Secure’s work in Tacloban City in the aftermath of Typhoon Yolanda. The main USAID website and the US Embassy website in Manila also featured an impact study and a news story about Be Secure, respectively. These international stories highlighted the quality and impact of Be Secure’s work to USAID’s global audience. Be Secure also utilized the power of social media by sharing project news, activities and information with its 1,433 followers on Facebook. By liking the page, followers receive Be Secure posts on their newsfeed. Be Secure created 232 posts on its Facebook page, which included news stories about the project, photos of events, videos, and knowledge materials. The posts gained an average “reach” of 200 to 2,000 exposures (number of unique people who saw the post). The post on the video “Your Water, Your Choice” had the highest reach of 16,600 people, with 540 post clicks, and engagement (likes, shares, comments) of 411. This was followed by the post showing the infographic “Homeowners Guide to Water Efficiency” with a reach of 4,400 online viewers, 261 post clicks, and engagement of 164.

The Social Media Campaign on Water Awareness, which was implemented through the partnership between Be Secure and the Philippine Star Digital Edition and Newspaper, featured infographics, water and sanitation facts shared on social media, and a 90-minute Facebook Live event on July 22, 2016 on water awareness. Be Secure experts discussed the Philippines’ current water situation and answered questions. The discussion was viewed 8,407 times within the first 24 hours. The “Your Water, Your Choice” video (described below) was viewed 3,216 times from the Philippine Star’s Facebook page as of August 10, 2017. (<https://www.facebook.com/PhilippineSTAR/videos/781738631979820/>). In addition, USAID’s Global Waters online magazine features the video, making it accessible to audience outside of the Philippines.

Table 2: International USAID Publications the Featured the Be Secure Project

PUBLICATIONS	TITLE OF ARTICLE	DATE OF PUBLICATION
Global Waters	Water Heroes (featuring Dr. Rachel Beja of COWD and Be Secure)	March 22, 2016
Global Waters	Changing Climate, Changing Minds: How One Philippine City Is Preparing for a Water-Scarce Future	May 5, 2016
Exposure	WINDS OF CHANGE: Building Resilience in Cities Devastated by Typhoon Haiyan	October 17, 2016
Global Waters	Treating Wastewater as a Resource	March 19, 2017
US Embassy	U.S. Government-Funded Partnership Advances Water Security in Visayas and Mindanao	March 23, 2017
USIAD.gov	Real Impact: Be Secure	May 23, 2017
Global Waters	Safe Water and Resilience: Making Every Drop Count In The Philippines	August 3, 2017

COMMUNICATION FOR EDUCATION AND OUTREACH

Be Secure engaged in outreach activities to help increase public education and awareness about water. Be Secure exhibited or displayed its communication and marketing materials in numerous events and workshops and supported its partners to organize special events, such as for World Water Day and World Toilet Day.

Be Secure organized a workshop on “Clean Water, Good Health: A Behavior Change Campaign to Prevent Water Borne Diseases” on June 2-3, 2016 in Zamboanga City, following the request of Mayor Maria Isabelle “Beng” Climaco to help stakeholders develop a behavior change and public awareness campaign on clean water and good sanitation. Participants developed a promotions program design, strategy and work plan on preventing water borne diseases for targeted audiences within communities.

To raise awareness on climate change and water conservation with the youth, Be Secure engaged student journalists in the Visayas Region. Be Secure and the Philippine Information Agency - Region 6 organized the “Basic Journalism Seminar Workshop for Campus Journalists on Panay Island” on August 4, 2016 in Iloilo City. As a result, the students wrote articles on water security and climate impacts on water that were published in 12 university publications that reached more than 20,000 students. Be Secure then selected four of the best articles and brought the writers to Manila to participate in the WaterLinks Forum (held October 6-7, 2016) and interview USAID/Philippines Mission Director Dr. Susan Brems about USAID’s water and climate change related activities. One of the students selected, Ms. Cherrie May Saavedra from the Iloilo Science and Technology University, has also become a champion of water security in her university as she continued to write regularly about water, climate change and the need to conserve water for her school publication, and has been invited to speak in school-organized forums about water and climate change.

Be Secure developed numerous communication and knowledge materials on water, sanitation, and climate resilience that were distributed for educational, capacity building and public awareness purposes. The materials were distributed to a potential audience of 9,009,544 people in schools, communities, households, government agencies, and the general public. An infographic on water use efficiency was

printed in Philippine Daily Inquirer, a major national newspaper with a circulation of 254,000 people nationwide. Some of the materials, such as the flipcharts and the safe drinking water brochure, were written in Filipino to reflect the preferences of the target audiences. Be Secure pre-tested the materials with members of the intended audiences to improve their effectiveness. Some of Be Secure’s partners made use of these materials to conduct their own outreach activities and others requested approval to reprint them for wider distribution after the project ends.

Be Secure has a YouTube channel that contains 26 project videos for public viewing. These include success stories, instructional videos on lime stabilization for septage management, live video coverage of El Gamma Penumbra’s shadow dance performance of “Water is Life” during Be Secure’s finale event, and “Your Water, Your Choice (described on pg. 31).

SEPTAGE FLIP CHART SUCCESS IN CDO

Safeguarding the Cagayan de Oro River is the objective of Safer River, Life Saver Foundation. Dr. Rosalina Huerbana, who leads the foundation, saw Be Secure’s flipchart on septage management and it was an eye-opener for her. “I learned that untreated septage can damage the Cagayan de Oro River and the aquifers,” she says. “It can contaminate water sources.” With the help of Be Secure, Dr. Huerbana and her team invited members of the academe and NGOs to translate the material into Visayan. The group has also made posters, comics, and a video on septage management.



YOUR WATER, YOUR CHOICE



Be Secure created a 12-minute short film called “Your Water, Your Choice” to give young Filipinos a better understanding how climate impacts affect water security in the Philippines, and the need to take action. This educational and entertaining film promotes water conservation and water use efficiency at the household level. The video was produced in collaboration with the Climate Change Commission, DPWH, and the YesPinoy Foundation, and stars professional actors Jose Sixto “Dingdong” Dantes III, Jerald Napoles, and Precious Leila Derlyn.

At the request of ZCWD, Be Secure developed short clips from the film that highlight the ways people can save water. They used the clips in their own water conservation campaign in June 2017 for the almost 900,000 residents of Zamboanga City. ZCWD expects that there will be spillover audiences in nearby provinces that have access to some of the Zamboanga-based TV and radio stations with a wider network in the Mindanao area. After six months of the campaign, ZCWD plans to re-dub and translate these video clips into local languages to further saturate the message into communities. ZCWD also plans on running the video clips on screens in their payment centers in 2018.

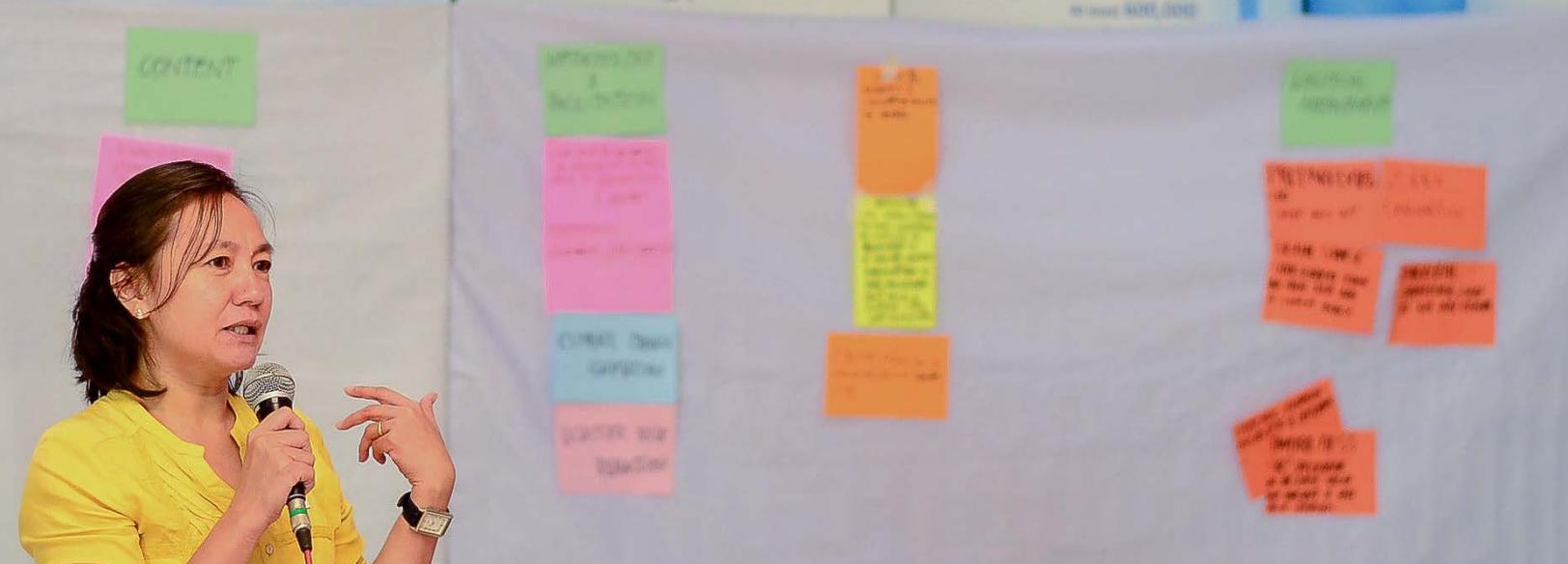
Be Secure distributed these clips to LGUs and water districts in its other focus areas, encouraging them to have them aired on local TV, radio and other media. Be Secure also requested SM Cinema to play these clips in between movie showings in all of their 60 cinemas nationwide. To date, the short film has been played more than 5,412 times with audiences ranging from 30-40 at individual workshops, and classrooms, to movie theaters and on-line with hundreds if not thousands viewing it. The Zamboanga Sky Cable network, which has approximately 50,000 viewers, also aired the video 23 times during World Water Week on March 12-18, on Sky Cable Community Channel 16, and on EMedia Channel 37.

Making Water Systems Climate Resilient: Lessons from Typhoon Yolanda

47.4% of affected households reported loss of drinking water due to lack of storage

100% of water supply districts after the typhoon

© 2014 WFP, UNICEF



PROJECT APPROACH

SUSTAINABILITY BUILT INTO IMPLEMENTATION STRATEGIES

Be Secure Project has been able to accomplish much in the last four years. However, considering that climate risk and water scarcity are expected to increase over time, it is important that these efforts are sustained. There was thus a conscious effort to consider sustainability from the very beginning by employing a number of strategies.

BENEFICIARY-DRIVEN ACTIVITY DESIGN

We ensured that project activities were done in response to the needs and priorities determined by our local partners and were not one-off activities that were externally imposed. By doing so, we foster buy-in of project interventions among our partners at the onset. This encouraged them to own the activities, adopt them as their own program, and eventually commit people and resources to ensure their sustained implementation beyond Be Secure.

TRAINING OF TRAINERS

Be Secure also encouraged many of the people we trained to act as trainers either in their own city or in other Be Secure cities, and conducted several training of trainers courses. In most cases, we included capacity building of our partner organization in the work that we and our subcontractors did, such as training DSWD technical staff so they can provide better assistance to LGUs and training COWD personnel so they can eventually lead the implementation of their NRW reduction program. Be Secure's climate resiliency work with the water districts was done with PAWD so they can continue it and share it with water districts nationwide. PAWD has seen the value of the work and has committed to continue it by tapping the members of the COP-CC as mentors for the other water districts in the country. They have thus included this training program in their work plan and the first regional training was already conducted in Iloilo for Region 6

LEGACY INSTITUTIONS

Be Secure worked with local academic institutions from the onset of the project, enabling their participation so that they can benefit from new knowledge and skills from technical experts and project-supported trainings, in turn, could assume the role of providing technical assistance to the LGUs, the water districts and other local stakeholders as well as their own student constituency. Three universities have now integrated Water Demand Management (WDM) into their curriculum, ensuring that Be Secure's work on climate resiliency will be sustained. CPU has even established a graduation requirement for engineering students that includes conducting water audits and promoting water conservation steps. CPU continues to use our materials to reach out to their students and the outside community. They now regularly conduct seminars on water security using all the learnings from the Be Secure project. All three universities Be Secure worked with have also established water libraries.

In partnership with the Philippine Association of Water District (PAWD), Be Secure helped develop a Community of Practice on Climate Change (COP-CC) among the six Be Secure target water districts. PAWD has seen the value of our work and has committed to continue what we have started by now tapping the members of the COP-CC as mentors for the other water districts in the country. They have thus included this training program in their Work Plan and the 1st regional training was already conducted in Iloilo for Region 6.

STRATEGIC ENAGAGMENT OF CHANGE-MAKERS

Finally, Be Secure worked with stakeholders whom the project identified as passionate and with the ability to drive change throughout the project. We have the ZWAT members of the Zamboanga City Water District, GMs of major Water Districts, Board members and officials of water districts, mayors, councilors, administrators, congressmen and senators, CPDOs and CDDRMOs, university professors and NGOs who now have a better understanding of the risk they face, what can be done and realize that they need to be more proactive for the sake of their families/ companies/ communities. Associations such as PAWD are already hosting training programs for other water districts. The fact that some of them now do volunteer work to train others on WDM (which is what the ZWAT members are doing) or to mentor other water utilities to become climate-resilient (which is what the General Managers of the 6 water districts are doing) is proof that the Be Secure work has made a difference in their lives and that indeed, we now have more local champions who can carry on the work long after the Be Secure Project has ended.

INTEGRATION ACROSS WATER AND CLIMATE CHANGE ADAPTATION INTERMEDIATE RESULTS

Water systems within our focal areas which were adversely affected by typhoons and/or flooding had to be rehabilitated and built back better – meaning they had to be made climate-resilient. While work on this was led by the IRI team, we worked together to identify what specific interventions were needed. This included using geo-hazard maps as reference in the siting of facilities to avoid locating them in high risk areas and making sure that structures could withstand stronger winds.

The water team also made use of the climate change projections prepared by MO in determining river discharges for water sources, for long- term mitigation measures such as projecting flood levels and river discharges as well as for the hydrology study to build an impounding dam for Zamboanga City.

MONITORING, EVALUATING, AND LEARNING

To ensure effective project implementation, Be Secure developed a Monitoring and Evaluation Plan (MEP) to specify how project results should be measured. This helped Be Secure to make operational improvements, identify performance gaps, re-evaluate objectives, and review targets. By the end of the project, Be Secure accomplished all of its deliverables and exceeded many of its targets. This would not have been possible without a strong and robust monitoring and evaluation activities led by M&E specialist Gio



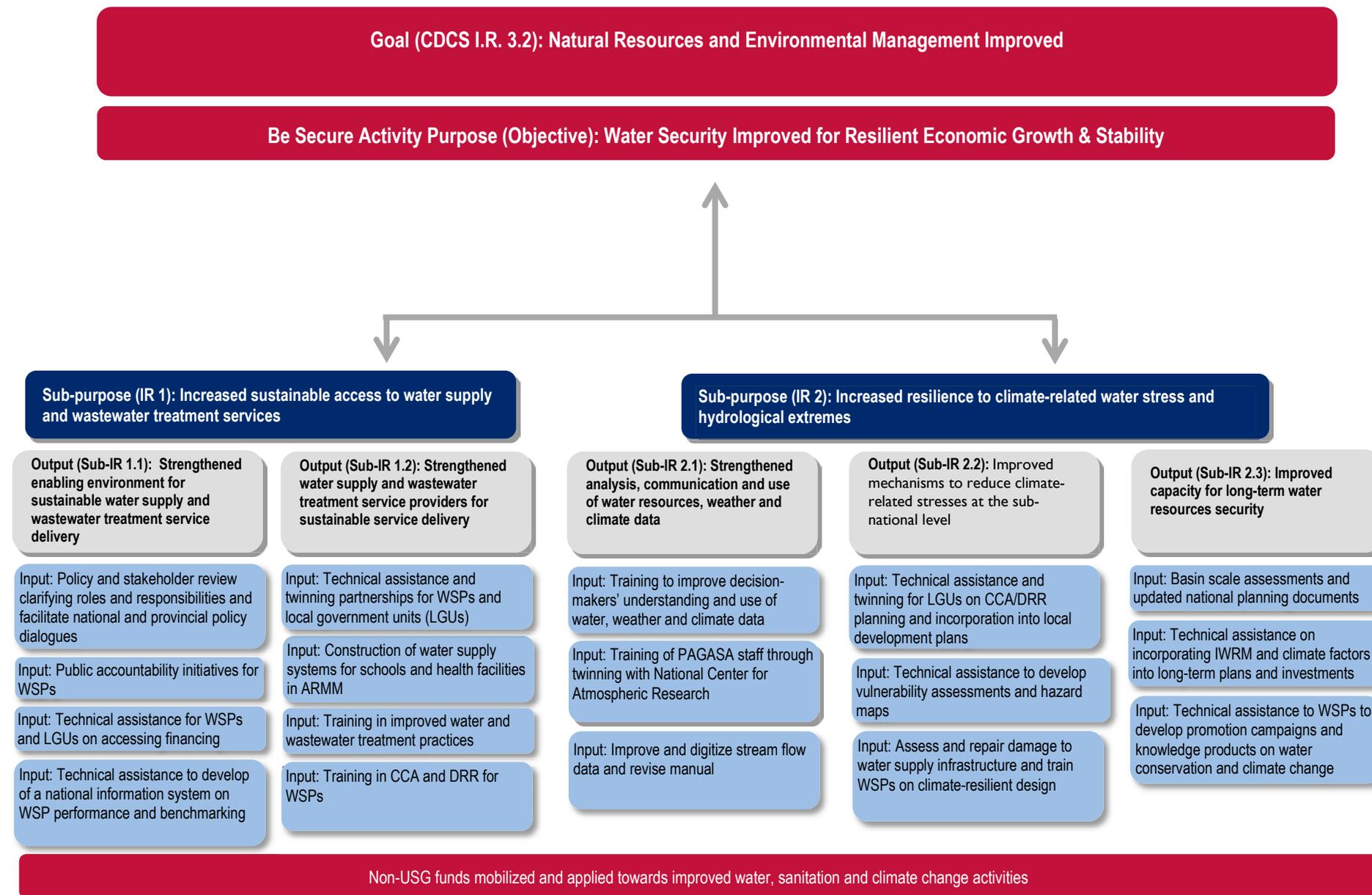
ADJUSTING WATER METERS IN TACLOBAN

Velez. The data collected and reported for each indicator provided USAID/Philippines detailed information regarding the project's progress and impacts throughout the course of the project. As a result, Be Secure was able to draw lessons that informed planning, design and implementation of activities as well as led to an adjustment of strategies or approaches in aspects where they are not working.

Be Secure had both standard and custom indicators. The standard indicator definitions (F indicators) were established according to State Department manuals. The custom indicators definitions (C indicators) were established to track and report deliverables specific to the project. In addition, USAID completed two Data Quality Assessments (DQA) for Be Secure in 2014 and 2016 which involved a review of indicators, results and identified necessary support. These assessments affirmed the high quality of data collected and used by project, which provided significant evidence to support the project's progress. The project applied the same data quality methodologies to ensure all updated data matches the quality and thoroughness of previous years.

Be Secure's Results Framework was designed based on a development hypothesis wherein catalytic leveraging of USAID resources would be essential, partnership approaches are both efficient and effective, and improved governance critical to long-term progress. Be Secure's Results Framework also linked USAID/Philippines's Development Objective (DO) "Environmental Resilience Improved," IR 3.2 "Natural Resources and Environmental Management Improved" with the Be Secure Project Objective of "Water Security Improved for Resilient Economic Growth & Stability." These objectives were then linked to two intermediate results and five sub-intermediate results. Figure 2 on page 11 shows Be Secure's overall Results Framework, which illustrates how project results, through inputs and outputs, contribute to achieving higher program objective and outcomes as well as USAID/Philippines' Development Objective.

Figure 2: Be Secure Results Framework



PRACTICAL AND OPERATIONAL RESEARCH

To ensure quality results, Be Secure, relied on existing research to design initial activities, and then made it a priority to add to the research base. In doing so, project activities are able to evolve, ensuring our partner organizations to become more prepared to address challenges in the future. A good example of this is Be Secure's work to determine the level of stakeholder satisfaction on the services of PAGASA regional offices. In addition to baseline assessments, pre-tests, and post-tests, Be Secure hired a research firm to work with the regions to assess the level of understanding of Disaster Risk Reduction (DRR). Several sweeps in Be Secure regions by the research firm with tested questionnaires, sampling Be Secure partners were conducted. One result of these sweeps was to ensure that satisfaction levels of PAGASA information remained high as the principal source of information during typhoon season. The results in the first sweep showed that satisfaction with PAGASA was consistently low in cities and areas where Typhoon Yolanda had made devastation a reality (Tacloban and Leyte Province), but were much higher in other areas (Iloilo and CDO). The surveys showed multiple areas that PAGASA needed to reinforce to get better satisfaction levels, from re-opening its facilities in Tacloban (rather than requiring Leyte province DRRM staff or the public to call Cebu); to appreciating the new public-friendly materials being produced by Be Secure, and the training efforts of Be Secure. The results show that the multiple efforts by Be Secure were successful to the point that at the end 99% of respondents recorded satisfaction levels with PAGASA.

Be Secure also used existing research data and segmentation principles to guide its communication activities. For example, while social media is widely accepted and used in the Philippines it became clear that many of our senior partners in government, (including general managers of water districts) still had problems manipulating data on cell phones, PCs and sometimes even e-mail seemed to be a barrier. Taking account of age and gender in defining how message content was developed became important. This was true as much of public audiences as it was of our professional partners. Be Secure reviewed educational data for different age groups and realized that as individuals aged, their early educational levels also reflected the kinds of things they might have been exposed to. One example is that younger Filipinos already have exposure to terms and explanations related to climate change, their older parents and others would not have had this exposure and needed time and questioning to be able to understand concepts better. As a consequence for young people Be Secure used social media platforms, while for older barangay residents Be Secure relied on Flip Charts, considered a low-tech option but nonetheless effective. Be Secure's work with PAGASA became the gold standard for this kind of field research as the importance of understanding the icons Be Secure was recommending, was vital for the safety of the community.

ENSURING DATA QUALITY IN REPORTING RESULTS

Because of the large numbers of trainees in Be Secure's training programs, several steps were initiated to ensure that reporting of results was based on real data. For Be Secure's training to small WSPs, the project made use of a three-step process that ensured the validity of all data both to capture learning that took place during the training sessions, and to assess impact post-activity.

1. During training activities, the pre-tests administered to trainees indicated their baseline skills and knowledge, followed by a post-test at the end of each session, which recorded the change in knowledge and skill level.
2. To validate successful access of funding by WSPs for their water systems, a certification from the local DILG or DSWD was requested to ensure that the necessary and correct documentation had been received and that the community had indeed received its funding. This is because most of Be Secure's support to provide people with basic access to water is through technical assistance and except for the work in Leyte and Maguindanao, did not involve

construction of large water systems to demonstrate direct access. The certification provides adequate proof that funds have been allocated, enabling the realization of the project, and delivery of results.

3. The Be Secure M&E specialist would make visits to randomly selected communities to verify accuracy of data on population served provided at the training, the capacity or yield of the water source to be improved by the WSP is sufficient to serve the identified population, and that indeed the necessary improvements had been made.

In WDM activities, it was occasionally necessary to precede a training activity with a sample of original data collected from the site. In most countries where mature WDM programs exist, data about end-use is already available but in the Philippines, end-use data has never been collected. When Be Secure was tasked by the Zamboanga Special Economic Zone Authority, to perform an audit of its main office building for water efficiency improvements, Be Secure used the opportunity to provide on-site training to its partners in the water district, as to the background data to consider when making recommendations about retrofitting a building. Be Secure performed an end-use study of the building, taking into account the kinds of offices already in the building, the uses of water by employees (number of bathroom visits and estimates of amount of water used for each visit), differentiating between men and women; assessing the age and quality of the existing water fixtures in the building (faucets, toilet tanks etc.) and even making calculations of water consumption using a tabo (water dipper commonly used in the Philippines) including frequency of use and comparing water amounts used in buckets and tabos compared to traditional flush toilets. It is this kind of data that informed the results presented at the end to the Zamboanga Special Economic Zone Authority to explain the savings that might result from retrofits.



LESSONS LEARNED & THE WAY FORWARD

Throughout the implementation of project activities, Be Secure has celebrated its successes while recording its challenges and lessons learned. The most important lesson we can draw from Be Secure’s work is that teams need to work together across objectives in order to achieve holistic success that will have long-term sustainable impacts. Our IRI and IR 2 teams collaborated on almost every activity, whether it was through activity design in work-planning, joint workshops, or sessions with water districts and LGUs. This Lessons Learned section details lessons learned across Be Secure’s major activities in water supply, sanitation, climate resilience, and disaster risk reduction, with the understanding that all of these activities intersect with each other and cannot be analyzed in silos.

WATER SUPPLY

FUNDING CHALLENGES

Not all water provider staff who were trained to access SALINTUBIG funds received funds. (See Figure 2 in the Indicator Results section below for the number of LGUs that received SALINTUBIG funding by focal area). Be Secure received a number of feedback why access to funding remains a key challenge for waterless barangays:

- **Timeliness of submission.** DILG provides SALINTUBIG funds on a fixed schedule and if the submissions come in late, the water provider then needs to wait until the next round.
- **Completeness of requirements.** In some cases the LGUs were not able to complete all the requirements. As an example, one of the requirements is a municipal council (Sanguniang Bayan) resolution endorsing the proposed water project. Therefore when the vice mayor, who heads the council, is not politically aligned with the mayor, the resolution does not get passed.
- **Sufficiency of water source.** In a small number of cases, when DILG's own inspection of the proposed water source shows it to be too small to provide the necessary yield, DILG rejects the application.
- **Capacity to implement.** In a few cases, it seems the proponents themselves realize they do not have the capability to implement the project, so they do not submit a request for funds.

One region where DILG funds were not accessed during the project period, despite their availability, is Maguindanao. The DILG ARMM received funds for water supply projects through the Transition Investment Support Plan and Bottom-Up Budgeting Program. To facilitate access, Be Secure representatives and engineers assisted in doing on-site planning with recipients, developing engineering designs, and evaluating the quality of their water source. Despite these, the eight targeted sites were still unable to receive SALINTUBIG funds. The national government needs to closely review the challenges to providing water services in conflict areas such as Maguindanao, which is also vulnerable to drought. During El Niño, Maguindanao suffered more than any other province in Mindanao from lack of water, both in urbanized areas and in smaller communities. Consequently, Be Secure made sure that each facility we supported to get water access (schools and health clinics) all had rainwater harvesting systems installed as backup in case wells in the area ran dry. The designs for the municipal systems provided to DILG ARMM also recommended rainwater harvesting systems as a climate adaptation feature.

NON-REVENUE WATER

Almost all water districts in the Philippines suffer to some extent from losses in their distribution network. Referred to as non-revenue water (and sometimes unaccounted for water), the resulting losses hamper any effort the water district might wish to make to expand their distribution network to underserved or non-served populations. Many water districts are able to serve only a small percentage of the population even within their service area 24 hours a day. More often a small percentage gets 24/7 water access, others get it for a certain number of hours per day. When rationing takes effect in the summer even these subscribers may have to fend for themselves or receive water from trucks as low water pressure in the system no longer allows for easy delivery. This can be a financial burden for the water districts themselves as they are often locked into contracts with bulk suppliers at fixed amounts requiring them to accept minimum amounts of water which they cannot always use. Water Districts need to invest in identifying and addressing NRW, which will in turn save them money in the long run and provide more consistent access to their customers.

PUBLIC PRIVATE PARTNERSHIP CHALLENGES

In Iloilo, the water district entertained an unsolicited bid proposal from private sector firm MetroPac Water Investments Corporation which offered to increase distribution services and improve and increase the level of water and sanitation services through privatization. Be Secure subcontracted Lahmeyer (now Tractebel) to provide transaction advisory services – the first TA of its kind despite a growing trend of unsolicited PPP offers to water districts,

The PPP evaluation and negotiation processes, which ideally should have been completed in one year, were severely delayed. This affected essential water services to schools and clinics in parts of the city and businesses that are rapidly growing. The delays also caused some services that would normally have been within the scope of MIWD to be contracted out to others, sanitation being the most important. Despite the delays, Be Secure’s assistance ensured that MIWD will receive sufficient, appropriate, and quality technical and financial proposal that will ultimately benefit the city’s water users. As of June 2017, the terms of reference for the challenge portion of the PPP has finally been agreed upon and approved by the MIWD Board, and shortly will be bid out.

Be Secure has good lessons learned from this effort over the two years of engagement in supporting the PPP and have shared those lessons with USAID, NEDA and the PPP Center in an attempt to encourage improvements. Notable of these lessons is the critical importance of having in place a strong and clear legal basis and rules to guide the PPP process for unsolicited bids. The existing policy and rules have gaps and these caused the delays as parties took time to interpret them. At present, there are over 60 unsolicited bids recorded by PAWD with different water districts. Without changes to the PPP process and greater support from LWUA and PAWD to help water districts negotiate with large water companies, residents are at risk of being disadvantaged from these types of partnership.

Moving forward, Be Secure recommends that USAID support PPP process in CDI cities with caution, unless the weaknesses in the process can be rapidly addressed. In general, Be Secure recommends opening the process to get multiple bids as this is really the only way the water district and residents will get the most favorable terms.

WDM AS PART OF BROADER WATER SECTOR REFORM

At the time the project closed, the rate of adoption of ordinances promoting water efficiency has slowed. With no project to take the activities to the next level, some of the dynamism is already slowing down. Water harvesting measures are being adopted in several municipalities and ordinances requiring water harvesting are moving well, but ordinances requiring new construction to use efficient fixtures have not yet passed City Councils. These would be, at a minimum some of the activities a new project might wish to support particularly as construction is probably the single most productive business in the Philippines. Large residential construction to accommodate the growing population is visible everywhere. Rising lifestyle expectations means that modern fixtures and modern water consuming equipment (washing machines etc...) are on the rise, particularly among the young and upwardly mobile, educated youth.

At the same time, the commercial sector faces various opportunities to adopt a more customized approach to water efficiency geared to the firm’s own uses if WDM is to be widely adopted. It therefore makes sense to bring in an expert and establish baselines such as for the brewing industry, or for an expert to develop a training program for the hospitality industry or for hospitals where international baselines have already been developed on a “per occupied room” or “per occupied bed” basis. Because water in most countries is far cheaper than electricity, it is often preferable to audit both in a facility and

give options for both. The savings, if both are implemented, can be considerable and can often be the tipping point between a manager agreeing to retrofit quickly rather than waiting. It should be clear to both the company owner and the auditor, that when auditing, the point of the audit is to provide guidance to the firm on where and how fast they need to retrofit, and where the cost savings might be found. For example, economic data is vital to convince hotel managers to make commitments to replace large ticket items like toilets. In the end it should be the number of firms that take action following an audit and the savings from those firms that is counted as program success rather than the number of firms that were audited.

Water reform really needs to start with the Filipinos themselves. The various efforts from the Water Summit, NEDAs subcontract to develop a Water and Sanitation Road Map, the efforts of individual Congressmen and women to pass bills that would reform the water sector are all good efforts to start the discussion on the critical importance of water security in the public sphere. Projects like Be Secure can support these efforts with data, research results, public opinion polls, drafting of legal language, but the imperative must come from inside the government or as advocacy from municipalities and water districts.

SANITATION

Despite major successes in sanitation work throughout the project, after four years of Be Secure implementation, only Isabela City's septage treatment plant is fully operational, with Tacloban City following suit and others at varying stages of implementation. From Be Secure's experience, LGUs faced various challenges. Among them include:

- Conflict between LGU and WD arising from income sharing arrangements and partisan politics;
- Determining the appropriate modality for charging and collecting septage fees, including the amount;
- Reluctance of politicians to introduce new fees to their constituents especially during an election season; and
- Legal provisions, while grounded on noble intentions to curb corruption in the bureaucracy, served as barriers for qualified LGUs to access the NSSMP.

Undoubtedly, these challenges delay the implementation of septage management programs and prevent Filipino residents from benefitting from these services. One game-changing approach used by Be Secure is to organize a dialogue between the LGU and WD, specifically in CDO and Iloilo. The dialogue facilitated by Be Secure helped resolve conflict, allowing for greater collaboration between and among concerned parties. These dialogues were complemented by field exchange to Dumaguete's septage treatment facility, which helped bring together city government and water district board members and facilitated greater trust among them. With a renewed relationship, CDO and Iloilo cities were able to advance their respective septage ordinance as well as agree on a suitable site and treatment method for the septage facility. The need for conflict resolution skills, while not anticipated at the start of Be Secure, proved to be useful and valuable in overcoming divergence and re-establishing trust.

SEWERAGE TO REPLACE SEPTAGE IN SANITATION SERVICES

Looking ahead, Be Secure recommend for other fast-growing that want to advance their sanitation programs to consider investing in sewerage at the onset for a number of reasons, namely:

1. Transition from septage to sewage treatment systems is complex
2. Rapid urbanization
3. Difficulty of disrupting road traffic
4. Rising costs for infrastructure, labor and disruptions as time goes on

However, it should be clear that stepping up from septage to sewerage is not a simple matter and the dynamics are very different. Many cities will need to expand their water distribution systems to reach a higher number of people in their service area and will need to make the switch to full sanitation services, while sewerage is a lower cost initial step towards better waste management. At the national level, Be Secure encourages the Government of the Philippines to implement sewerage systems in large secondary cities, at the same time as they are allowing PPPs to become concessionaires for water distribution, so that PPPs can drive investment needed for expanded sewerage. The NSSMP, once amended, will be instrumental in advancing sewerage systems, the cost of which is normally three times more than water supply systems. In addition, the national government should promote the installation of decentralized sewerage systems as is being done in Metro Manila rather than a single centralized system. Decentralized interceptor systems eliminate the need to install sewer pipes and minimize the disruption.

“I would like to extend my heartfelt thanks to USAID for bringing some of the members of the Palo MDRRMC to the Province of Albay. Their experience was an eye opener to the municipality in all aspects of Disaster Risk Reduction. The Palo MDRRMA is reorganizing itself to integrate all learnings and innovations to harness our MDRRMC.”

**- REMEDIO “MATIN” L. PETILLA,
MUNICIPAL MAYOR OF PALO,
LEYTE**

DISASTER RESPONSE AND RISK REDUCTION

The devastation caused by Typhoon Yolanda has brought to the fore the negative impacts of climate change to water infrastructure. Likewise, the recent episode of a strong El Niño has exposed the vulnerability of our water supply. Standard water infrastructure design procedures that used to work in the past need reevaluation to be able to withstand more frequent severe storms and more prolonged drought anticipated with climate change. More resilient design measures must also be coupled with the need for behavioral change and encourage water efficiency from both the supply and the demand side.

Once the risks have been identified, utility operators or other stakeholders must determine acceptable levels of risk. Some potential impacts or consequences may seem insurmountable if they were to occur, while others will be viewed by communities as more tolerable or manageable. Final decision-making on the appropriate level of construction or rehabilitation will be driven by those risks that the community has identified as unacceptable.

CLIMATE RESILIENCE

Ensuring the availability of safe water to sustain natural systems and human life is integral to the success of the development objectives, and policy goals of the Philippines. Water security is vital to the Philippines’ economic growth and development, as water supply and sanitation services affect public health, productivity, and quality of life.

Water shortages were experienced as a result of this El Niño, and climate change impacts are projected to continue to negatively affect water supplies throughout the country. Therefore, actions to improve the management, storage and use of water are urgently needed both at the public and private sector levels to address both short-term and long-term shortages.

The main challenges are the low levels of understanding of climate change among people despite the many pronouncements in the news. Many people do not understand what options are available to the government and private sector and at what price, nor do they understand the price of inaction by decision-makers. In addition, the government response to climate change and El Niño challenges in water security focuses mainly on supply-side water management options. The Philippines lacks comprehensive national or provincial policies for water efficiency. Moreover, the government is faced with numerous challenges in policies, institutions and operations that cut across the water sector. One major institutional challenge is the weak water governance given the conflicting and overlapping mandates of water agencies where multiple players make it difficult for the management and coordination of water initiatives, resulting in counterproductive measures.

The Philippines should continue to build off work Be Secure has launched and include some specific recommendations:

At the local levels:

- Focus on implementing WDM measures and practices at large commercial and government facilities
- Support an education campaign in order to improve the motivation for communities to embrace WDM principles
- Introduce and promote drought response principles in the water sector
- Labeling of fixtures in conjunction with what is being done on a national level followed by developing water efficiency standards
- Establish rainwater harvesting program

At the National level:

- Do not assume all WDM best practices will have same effect in the Philippines
- Adopt an Integrated Water Resources Management
- Integrate data use and technology innovation into water programs
- Work with government agencies to support the establishment of a program of “Government leading by example”
- Sanitation
- Reuse of Reclaimed Water
- Water harvesting in the context of IWRM

SCALED UP RESEARCH TO INFORM PROGRAM DESIGN

Recognizing that the impacts of climate change differ in different parts of the country and that in order to reduce risk to climate impacts, one needs scientific data to understand the climate hazards and the extent of their likely impacts on your area and/or operations. As such, understanding changes in climatic conditions in vulnerable areas is important in developing an effective, institutionalized response to reduce and mitigate disaster risks and adapt to climate change.

Figure 12: Recommendations for developing a research base in the Philippines



END USE STUDIES

that can demonstrate the real water savings from each fixture, or determine the water consumption behaviors of consumers, and show the water consumption calculations of traditional behaviors.



DATA MINING

already available to water districts through subscriber bills, to determine variability of water consumption that can be used to develop messaging encouraging conservation.



DEMAND FORECASTING

to determine exactly how much demand over time will be needed. Currently most utilities do not adequately forecast demand and use simple population growth to determine forecasting.



FINANCE STUDIES

to clearly demonstrate to municipalities, homeowners and developers that the add-on cost of efficient fixtures is not excessive and can be easily borne even by low-income populations.

FINAL FINANCIAL ANALYSIS

Table 5: Final Financial Analysis

	Total Contract Budget (USD)	Cumulative Expenditures Prior to the 4 th Quarter	4 th Quarter Expenditures (April 8-July 7, 2017)	Cumulative Expenditures Through July 7, 2017	Contract Balance
Salaries	\$4,389,293	\$3,856,430.05	\$327,954.77	\$4,184,414.95	\$204,908.18
Fringe	\$274,319	\$328,162.43	\$29,017.74	\$357,180.17	\$(82,861.17)
Travel	\$1,246,359	\$829,322.92	\$(26,635.69)	\$929,488.57	\$443,671.77
Allowances	\$313,171	\$255,599.86	\$36,269.71	\$279,444.14	\$21,301.43
Other Direct Costs	\$8,517,643	\$6,077,436.93	\$1,048,544.40	\$7,011,574.93	\$1,391,661.67
Indirect Costs	\$2,849,196	\$3,223,796.68	\$459,930.13	\$3,683,726.97	\$(834,530.81)
Fixed Fee	\$1,143,349	\$922,712.51	\$112,294.77	\$1,035,007.48	\$108,341.72
Original Award	\$18,733,330	\$15,493,461.38	\$1,987,375.83	\$17,480,837.21	\$1,252,492.79
Disaster Recovery	\$2,695,193	\$2,663,026.91	\$31,168.13	\$2,694,195.04	\$997.96
Fee	\$175,188	\$150,435.54	\$3,724.96	\$154,160.50	\$21,027.50
Total	\$21,603,711	\$18,306,923.83	\$2,022,268.92	\$20,329,192.75	\$1,274,518.25
Funds Obligated	\$21,456,620.56				
Cumulative Expenditures	\$20,329,192.75				
Balance	\$1,127,427.81				



ANNEXES

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3. Annex C: Be Secure Organizational Chart
4. Annex D: Detailed Indicator Results by Fiscal Year
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ANNEX B: BE SECURE MAJOR ACCOMPLISHMENTS BY TASK

Table 6: Major Accomplishments by Task

TASK	MAJOR ACCOMPLISHMENTS
<p>Task 1.1.1 Strengthen Government Accountability</p>	<ul style="list-style-type: none"> Served as secretariat of the Philippine Development Forum Sub-Working Group for Water Supply and Sanitation and developed a website for the group to increase public awareness and collaboration. Helped plan and conduct a Water Summit convened by NEDA, DENR and the Office of the President. An executive order for water sector reform will be endorsed and signed by President Duterte, which will lead to better water policies and management going forward. Supported amendments to the Water Code through a series of legislative reviews/town meetings regionally and nationally and submitted outputs to NWRB for more practical and relevant requirements.
<p>Task 1.1.2 Strengthen Regulatory Framework</p>	<ul style="list-style-type: none"> Reviewed existing bills, held legislative reviews with relevant government agencies and developed a consensus report for the Water Regulatory Commission bill. The bill was filed in the House of Representatives in February 2017. A Be Secure representative was part of the technical working group.
<p>Task 1.1.3 Mobilize Financing</p>	<ul style="list-style-type: none"> Leveraged more than \$42.7 million in public and private financing specifically for improved water, sanitation, CCA and DRR. Obtained \$300,000 from Coca-Cola Foundation Philippines to reduce NRW in CDO. Provided transaction advisory support to MIWD in negotiating a PPP with MetroPac Water Investments Corporation, which proposed a joint venture to improve and expand MIWD's services. Developed the terms of reference for the MIWD challenge process. MIWD approved the joint venture worth \$240 million for 25 years with \$48 million to be implemented in the next five years. Provided a Lessons Learned Guide and Recommendations for revisions to protocols for unsolicited water and sanitation PPPs to NEDA and the PPP Center, based on the Iloilo experience. Established the Water Alliance, which has 52 members from the private sector engaged in improving water security in the Philippines. Provided expert advice to the Congressional Committee on House Bill No. 10 submitted by Congressman Lobregat to obtain priority financing for the Zamboanga impoundment dam from NEDA. The priority financing was approved. Provided technical assistance and advisory services to ZCWD to obtain up to Php 200 million from the NSSMP for a sewerage/septage treatment facility. Transmittal of funds awaiting the development of protocols.

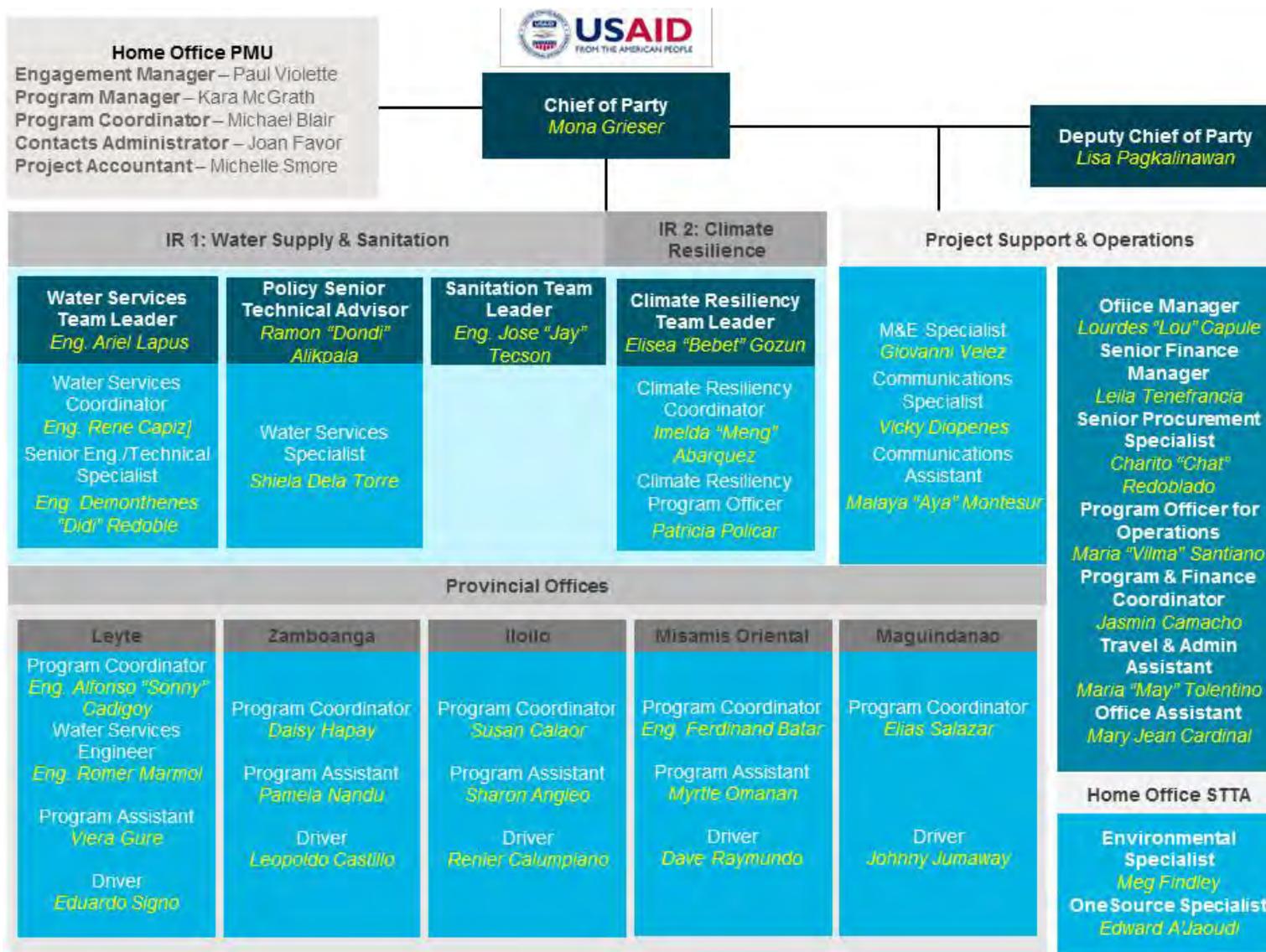
TASK	MAJOR ACCOMPLISHMENTS
<p>Task 1.1.4 Strengthen Data Management</p>	<ul style="list-style-type: none"> • Helped develop, conduct surveys and provide data to Listahang Tubig, a national water survey and database of WSPs used to improve regulation and benchmark performance. • Ensured the continued funding of the Listahang Tubig program and website by the government. • Trained COWD staff in GIS management through NRW skills building and integration into COWD data systems.
<p>Task 1.2.1 Increase Access to Services</p>	<ul style="list-style-type: none"> • 1,866,396 people with access to improved water supply from these major sources: <ul style="list-style-type: none"> ○ 652,328 people with access in partnership with DILG and DSWD. ○ 455,424 people with access by reducing NRW in CDO. ○ 300,000 people with access through the Iloilo City PPP involving MIWD and MetroPac Water Investments Corp. ○ 154,970 people with access to improved water supply following a feasibility study and designs for mitigating the risks from erosion and collapse of Binahaan River banks that could cut off water supply to Tacloban and surrounding areas. This led the provincial government to spend \$510,204 on riverbank repairs. ○ 5,634 people with access on Malamawi Island, Basilan, a conflict-affected area. • More than 2,600 people and 318 patients per day with access in ten schools and health clinics in Maguindanao Province, also a conflict-affected area. • Conducted feasibility studies for new water sources in CDO, Cotabato, and Tacloban and a pre-feasibility study for Zamboanga City that allowed local partners to make sound decisions to increase their water security.
<p>Task 1.2.2 Increase Service Provider Capacity</p>	<ul style="list-style-type: none"> • 1,044,715 people with access to improved sanitation in CDO, Cotabato, Isabela, Ormoc, Tacloban and Zamboanga Cities. • 5 septage management ordinances passed in CDO, Cotabato, Isabela, Ormoc, Tacloban Cities.
<p>Task 2.1.1 Improve Analysis and Sharing of Data</p>	<ul style="list-style-type: none"> • Improved PAGASA’s weather forecasts through training from NCAR to support more effective early warning systems and disaster preparedness. • Improved comprehension of PAGASA alerts and warning systems by simplifying their communication products and conducting training. Introduced new PAGASA icon “Ella the Umbrella.” This increased stakeholder satisfaction with information provided by PAGASA’s regional offices to 99%. • Digitized streamflow data and made it available on a public website run by DPWH.

TASK	MAJOR ACCOMPLISHMENTS
Task 2.1.2 Improve Capacity to Utilize Data	<ul style="list-style-type: none"> Strengthened the climate resiliency of six water districts through the formation of the PAWD Community of Practice on Climate Change, training and mentoring from the Florida Water and Climate Alliance. The water districts produced climate-resilient business plans and emergency response plans that have all been approved by their boards, and Be Secure produced a toolkit that other water districts can use to replicate the process. Assessed the change in hydrological risk of four Be Secure focal cities over a period of three years and trained their staff to use GIS and the risk registers to continue assessing risk and generate risk maps through a capacity-building program.
Task 2.2.1 Climate Risk Evaluation	<ul style="list-style-type: none"> Downscaled climate projections and prepared vulnerability assessments of water resources, vulnerability map and climate hazard maps for CDO, Iloilo and Zamboanga Cities and Leyte Province and trained partners how to use this information in their planning to be more climate resilient.
Task 2.2.2 Municipal/Provincial CCA/DRR Planning	<ul style="list-style-type: none"> Helped make local development plans more climate-resilient by increasing the capacity of LGU staff and stakeholders to use climate information and scientific studies to mainstream CCA/DRR into the following: 4 LCCAPs approved (CDO, Ormoc and Zamboanga Cities; Basilan Province). 7 LDRRMPs approved (CDO, Cotabato, Tacloban, and Zamboanga Cities; Basilan Province, Palo Municipality, Barangay Tacuranga in Palo). 9 enhanced CLUPs developed. 1 enhanced Provincial Physical Framework and Development Plan (Basilan). Leveraged \$1.9 million to establish a Provincial Disaster Risk Reduction Management Office (PDRRMO) in Leyte Province as a result of a twinning with Albay Province
Task 2.2.3 Reduce Risks of Extreme Events	<ul style="list-style-type: none"> 301,539 people with access to improved water supply following repair and improvement of water systems damaged by Typhoon Yolanda in 8 municipalities, 17 schools and 4 health clinics in Leyte Province.
Task 2.3.1 Mainstream Integrated Watershed Resource Management (IWRM)	<ul style="list-style-type: none"> Mainstreamed IWRM into the plans of small water service providers, Iloilo River Management Council, Tigum-Aganan Watershed Management Board, Jalaur River Basin Management Council and Iloilo-Batiano River Development Council and helped the latter three organizations develop climate change action plans. Iloilo Watershed Management Council institutionalized the Water Evaluation and Planning tool into watershed management and monitoring plans.
Task 2.3.2 Increase Public Awareness	<ul style="list-style-type: none"> Zamboanga City Water District created a Water Demand Management Unit with \$57,572 in funding for 2016 and 2017, produced two water audit manuals and have a trained water

TASK	MAJOR ACCOMPLISHMENTS
	<p>audit team that has conducted training for several other organizations outside Zamboanga City, and conducted extensive communication campaigns promoting water conservation.</p> <ul style="list-style-type: none"> • Department of Trade and Industry issued national standards on water efficiency labeling. • Iloilo Province allocated \$255,319 to develop rainwater harvesting facilities. • Iloilo City passed an ordinance creating a water efficiency and conservation council and mainstreamed WDM into city development plans and budgets. • DPWH approved \$14.5 million for nationwide implementation of rainwater harvesting for FY2016 and issued a department order requiring its offices to conserve water. Be Secure trained DPWH trainers nationwide to conduct water audits. • Central Philippine University, Xavier University and Western Mindanao State University integrated climate change and WDM into their curricula, and retrofitted major buildings to use water more efficiently. They established requirements for university seniors to promote water conservation. • SM Cinemas has agreed to use Be Secure spots and videos in 62 movie theaters across the country as part of the company's corporate social responsibility. • Major regional and national print and social media provided Be Secure with the equivalent advertising value of \$47,000 for water efficiency promotion.

ANNEX C: BE SECURE PROJECT ORGANIZATIONAL CHART

Figure 13: Be Secure Organizational Chart



ANNEX D: DETAILED INDICATOR RESULTS BY FISCAL YEAR

See Attached Excel Spreadsheet for Table 7: Detailed indicator Results by Fiscal Year

ANNEX E: BE SECURE COMMUNICATIONS PRODUCTS & REPORTS

Table 7: Be Secure Communications Products

Category	Form	Title of Publication
Technical	Print	Implementer’s Guide to Lime Stabilization for Septage Management in the Philippines
Public Awareness	Print	Septic Tank Emptying Program: Cleaner Communities, Healthier Families (Flipchart)
Public Awareness	Print	Klima at Tubig (Climate and Water) (Flipchart)
Technical	Print	Reporting on Water Security: A Guide for Journalists
Public Awareness	Print	Safe Drinking Water Brochure
Public Awareness	Print	The Wealth That Is Water (success story photobook)
Technical	Video	Instructional Videos on Septage Management
Public Awareness	Video	“Your Water Your Choice” Film
Public Awareness	Video	Tips on Water Use Efficiency (based on the short film “Your Water Your Choice”)
Public Awareness	Video	El Gamma Penumbra Shadow Dance “Water is Life”
Technical	Print	Climate-Resilient Water Infrastructure: Guidelines and Lessons from the USAID Be Secure Project
Technical	Print	Water Audit Toolkits - Residential Sector - Zamboanga City Water District
Technical	Print	Water Audit Toolkits - Commercial and Institutional Sectors – Zamboanga City Water District
Technical	Print	Toolkit for Climate Resilient Water Utility Operations
Technical	Print	Technical Briefer- Planning for Climate Change Adaptation
Technical	Print	Technical Briefer- Helping Decision-makers Better Utilize Water Resource, Weather and Climate Data
Technical	Print	Technical Briefer- Improving Efficiency in Water Utilities: Cagayan de Oro
Technical	Print	Technical Briefer- Strengthening the Enabling Environment for Water
Technical	Print	Technical Briefer- New Water Systems for Waterless Areas
Technical	Print	Technical Briefer- Strengthening Wastewater Treatment Services

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