USAID
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ADVANCING THE BLUE REVOLUTION INITIATIVE

FINAL REPORT: MAY 2007 – NOVEMBER 2010




NOVEMBER 2010

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COLLABORATING ENTITIES ON ABRI

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Development Alternatives, Inc. (DAI)

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CH2MHill Middle East
ECO Consult, Jordan
Emerging Markets Group
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Social Impact
Texas Universities Partnership
Training Resources Group, Inc.
ValuAdd Management Services
Women for Water Partnership

Grantees
American University of Beirut
Euphrates-Tigris Initiative for Cooperation

COVER PHOTOS:

Tigris River winding its way through Iraq. See Activity 1.1: Transboundary River Basin Management	WASH training for USAID staff. See Activity 3.3: African WASH Trainings
Women in Morocco discussing how they are affected by current water use practices. See Activity 2.1: Water User Association Business Planning	Meknes Wastewater Treatment Plant. See Activity 2.2: Morocco Wastewater Reuse for Agriculture

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CONTENTS

ACRONYMS AND ABBREVIATIONS

ACWUA	Arab Countries Water Utilities Association
ABRI	Advancing the Blue Revolution Initiative
ADWEA	Abu Dhabi Water and Electricity Authority
AFD	African Development Bank
AFR	Bureau for Africa
AFWA	African Water Association
AFESD	Arab Fund for Economic and Social Development
AmCham	American Chamber of Commerce (Jordan)
AMCOW	Africa Ministers Council on Water
ANE	Bureau for Asia and the Near East
AUB	American University of Beirut
AWA	Arab Water Academy
AWCA	Arab Water Council
AWWA	American Water Works Association
BOT	Build Operate Transfer
CEDARE	Center for Environment and Development for the Arab Region and Europe
CPWC	Cooperative Programme on Water and Climate
CTO	Cognizant Technical Officer
DCA	Development Credit Authority
DSI	Devlet Su Isleri or State Water Works
EQI	Environmental Quality International
EGAT	USAID Bureau for Economic Growth, Agriculture, and Trade
ESCWA	Economic and Social Commission for Western Asia (United Nations)
ETIC	Euphrates-Tigris Initiative for Cooperation
EUWI-FWG	European Union Water Initiative – Finance Working Group
EWAP	Evian Water Action Plan
GAP	Greater Anatolia Project
GDA	Global Development Alliance
GDP	Gross Domestic Product
GIS	Geographic Information Systems
GOE	Government of Egypt
GTZ	Gesellschaft fuer Technische Zusammenarbeit
GWA	Gender and Water Alliance
GWC	Global Water Challenge
HIP	USAID Hygiene Improvement Project
ICT	Information and Communication Technology
ICARDA	International Center for Agricultural Research in the Dry Areas
IDARA	Instituting Water Demand Management in Jordan Program (USAID)
IFC	International Finance Corporation

IJC	International Joint Commission of the United States
IP3	Institute for Public-Private Partnerships
IWA	International Water Association
IUCN	International Union for Conservation of Nature
JEWEL	Jordan Education for Water and Environmental Leadership
JUST	Jordan University for Science and Technology
MDG	Millennium Development Goal
MENA	Middle East and North Africa
MOU	Memorandum of Understanding
NWSC	National Water and Sewage Corporation
NWRA	National Water Resources Authority (Yemen)
O&M	Operation and Maintenance
OES	Bureau of Oceans and International Environmental and Scientific Affairs
O/MEA	Office of Middle East Affairs
OMEP	USAID Office of Middle East Programs
ONEP	Office National de l'Eau Potable (Morocco)
ORMVAH	Office Régional de Mise en Valeur Agricole du Haouz (Morocco)
PMP	Performance Monitoring Plan
PWRF	Philippines Water Revolving Fund Program (USAID)
RAED	Arab Network for Environment and Development
RITSEC	Regional Information Technology and Software Engineering Center
RSB	Abu Dhabi Regulatory and Supervisory Board
SEEP	Small Enterprise Education Promotion Network
SIDA	Swedish International Development Agency
SIWI	Stockholm International Water Institute
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNESCO-IHE	UNESCO – International Water Education Institute
UNISDR	United Nations International Strategy on Disaster Reduction
UNU	United Nations University
WASH	Water Hygiene and Sanitation
WBCSD	World Business Council on Sustainable Development
WCN	Water Center Network
WEF	Water Environment Federation
WEF	World Economic Forum
WIN	Water Integrity Network
WOP	Water Operator Partnership
WUA	Water User Association
WWC	World Water Council
WWF	World Wildlife Fund
WWW	World Water Week

MAJOR RESULTS OF THE ADVANCING THE BLUE REVOLUTION INITIATIVE

As originally conceived, the Blue Revolution Initiative was expected to transform the culture and governance of water in the Middle East and Africa. ABRI's mandate was to advance that transformation. We believe that in its brief three years of implementation, ABRI did exactly that. In advancing the Blue Revolution, ABRI:

- Supported and strengthened fledgling regional platforms in the Middle East and Africa that will increasingly serve as valuable technical hubs on transboundary basin and water and wastewater utility management;
- Addressed the most critical efficiency issue in the sector–massive withdrawals for irrigation–by introducing business planning to historically unsustainable water user associations;
- Established continuing partnerships across national boundaries for exchanges in technical approaches and management systems that will upgrade existing entities and make them better service providers;
- Created new partnerships between the public and non-traditional private sector entities that will expand the financial and human resource pools;
- Confirmed USAID's role as an intellectually creative agency in the forefront of change in the water sector;
- Groomed the next generation of water sector leaders so that they are better prepared to tackle the increasingly complex issues they will face; and
- Produced the first-ever step-by-step project design manual for USAID staff. Staff will be better prepared to identify WASH problems, conceptualize responses, and determine appropriate project components and activities in water, sanitation, and hygiene.

The major results and achievements of the three years of ABRI implementation are the following:

- **The Tigris-Euphrates basin has a strengthened transboundary regional platform.** ABRI's transboundary river basin cooperation activity has strengthened a regional platform, the Euphrates-Tigris Initiative for Cooperation that is composed of eight universities in Iraq, Syria, and Turkey. As a result of our activity, ETIC has demonstrated that it can successfully design and implement a technically complex and politically sensitive activity across national borders. Through the activity, ETIC was also able to forge an ongoing, mutually beneficial, long-term relationship with the American University of Beirut (AUB) as an institutional anchor in the Middle East. As a result, ETIC and AUB are moving ahead with partnerships in other areas.
- **USAID is recognized as a potent transboundary facilitator in the Tigris-Euphrates.** USAID has been able to demonstrate in the Tigris-Euphrates that it can be a strong intellectual leader in transboundary freshwater efforts by virtue of its ability to harness local and regional talent in productive relationships at a Track 2 level of diplomacy.

- **Water user associations are more likely to thrive as they will operate as business entities raising farmer incomes.** Through detailed business planning efforts with irrigation water user associations in Egypt and Morocco, ABRI has shown that farmers will enthusiastically engage in income-generation promoting activities and that the private sector is equally prepared to get involved once it is confident it has a reliable partner. The business plan is the concrete tool that sets a practical direction for the WUAs and encourages the private sector to form long-term relations.

- **The Government of Morocco now has a first-time strategy for wastewater reuse for agriculture that will serve as a model for the country.** ABRI worked with an interagency committee in Meknes to develop a first-time strategy for the Government of Morocco to reuse wastewater from its first major treatment plant for agriculture.

- **USAID/Morocco has adopted ABRI's approach to WUA sustainability and wastewater use and built them both into a long-term project, Morocco Economic Competitiveness (MEC).** ABRI's efforts with WUAs in Morocco and with wastewater reuse for agriculture in Meknes have convinced the mission to integrate these approaches and strategy into its new water, enterprise, and manpower project.

- **USAID/Yemen has established a presence in the remote region of the Hadramawt, the ancestral homeland of the Ben Ladin family.** Under an ABRI activity in Yemen, USAID supported efforts in the National Water Resources Agency (NWRA) to assess groundwater resources for future action.

- **The fledging Egyptian Water Regulatory Agency is a stronger entity by virtue of its twinning relationship with the Abu Dhabi Regulatory and Supervisory Board and ABRI's support for technical certification.** ABRI fostered a twinning relationship between the two agencies that led to visits and a staff exchange.

- **The Arab Countries Water Utilities Association is a stronger and better managed regional platform with a greater likelihood of financial sustainability and technical excellence.** Through a diverse program of support, ABRI supported the association in the development of a five year business plan, in raising its reputation at high profile, international fora, and in strengthening its technical program.

- **Two African water and sanitation utilities will be stronger entities through a twinning agreement.** Uganda's National Water and Sewage Corporation and the Southern Sudan Urban Water Corporation have established a formal, long-term twinning relationship, fostered by ABRI under the African Water Operator Partnership. The result will be a stronger SSUWC which will profit from a diagnostic analysis of the structure and responsibilities. NWSC is stronger as it builds credibility as a provider of services to other utilities in the region.

- **USAID staff in 21 mission and three regional program across Africa gained a good understanding of the issues and requirements in water, sanitation, and hygiene for project design in anticipation of increased funding in the sector.** ABRI, working closely with the USAID Water Team, designed four trainings for USAID staff in Dar es Saalem, Maputo, Dakar, and Nairobi

- **Numerous microfinance deals and partnerships have been made between funders and implementers.** ABRI took the lead working with the Bill and Melinda Gates Foundation, bringing together many parties in the US and Europe to advance microfinance as an alternative financing tool.

- **There is greater, widespread interest in dealing with non-revenue water by African utilities.** ABRI produced a non-revenue water handbook which has sparked great interest in dealing with this continuing serious problem on the continent.

- **ABRI helped raise the profile of USAID in the non-traditional international community of UN organizations, European entities, foundations, and regional water operator platforms.** ABRI identified and worked closely with many potential partners who were not traditional collaborators with USAID.

- **A cadre of mid-level water experts in the Middle East are more informed about current and future water issues and better able to assume positions of leadership in the future.** Through its Future Water Leaders Program, ABRI convened sessions bringing together future water leaders from across the Middle East, training them in technical and management issues.

- **The U.S. has made progress on the design and development of the Middle East and North Africa Water Center Network (MENA WCN), a key presidential initiative.** ABRI worked closely with USAID, the State Department, and the Interagency Water Group to consult with key stakeholders in the region and design the Center with them.

1 INTRODUCTION: OBJECTIVES AND APPROACH

By working closely with missions and governments in the Middle East and Africa, actively pursuing alliances with the private sector, reaching out to like-minded foundations, and partnering with regional institutions and associations, the Advancing the Blue Revolution Initiative (ABRI) has sought to address some of those regions most challenging water issues: transboundary river basin management, inefficient and nonproductive water use, lack of access by the poor to improved water and sanitation services, and institutional and policy weaknesses. Its goal was the transformation of the culture and governance of water resources in the two regions, hence its title suggesting advocacy and change.

Such an ambitious program required creativity in structure and approach. ABRI is unusual in many ways. It is jointly managed and funded by four sources: the Bureau for the Middle East (ME), the Bureau for Africa (AFR), the Office of Middle East Programs (OMEP) housed in USAID/Egypt, and USAID/Egypt. It has been a truly regional platform with a mandate to share lessons learned and implement best practices across national borders. It aimed to draw missions, governments, and other stakeholders in the two regions together through jointly designed and implemented technical activities. It also recognized the close partnership between USAID and the Department of State, given the political sensitivity and international nature of the issues being addressed. ABRI used its funding for a multiplier effect from investments in high profile and high impact opportunities that encouraged substantive and sustainable change.

ABRI also helped USAID missions conceptualize new strategies and design new programs that supported the Agency's commitment to the Paul Simon Water for the Poor Act and the Millennium Development Goals. The Paul Simon Water for the Poor Act of 2005 established as a central goal of U.S. foreign policy the provision of affordable and equitable access to safe water and sanitation in developing countries. The act requires the Secretary of State, in consultation with the U.S. Agency for International Development (USAID) and other U.S. government agencies, to develop a strategy to increase this access within the context of sound water management.

ABRI'S GEOGRAPHICAL CONTEXT

ABRI operated throughout the Middle East and Africa. This is an area of major contrasts when joined together in a single implementation effort. It has huge disparities in wealth and poverty and in water availability and water scarcity. The Middle East and Africa have some of the world's greatest river systems while much of its population suffers from limited access to safe drinking water. Despite having many huge cities like Cairo and Lagos, it is largely rural, often with the majority of the population working in agriculture and related industries. They are areas of political instability and social turmoil, but also areas offering opportunities for change.

CHALLENGES IN THE MIDDLE EAST

The countries of the Middle East and North Africa are the most water scarce in the world. Although this region controls 70 percent of the world's known oil reserves, it has less than one percent of the world's renewable freshwater resources. It is defined largely by drought and

desert, and suffers from a scarcity of fresh water, uneven availability, a growing gap between supply and demand, and deteriorating water quality. Home to five percent of the world's population, this region has an average per capita annual water supply of 900 cubic meters per person per year that masks extreme shortages in places like Gaza and Jordan that receive fewer than 150 cubic meters per person per year. High population growth rates (averaging 2.1 percent) increase pressure and competition for scarce water resources and, given the region's history of conflicts, could set off smoldering religious, political, and economic tensions.

Agriculture remains a critical component of the region's economy, contributing as much as 23 percent to gross domestic product (GDP), employing between 25 and 30 percent of the workforce, and consuming more than 80 percent of the total annual water resources. Growing populations and accelerating urbanization, combined with the expanded commercial cultivation of crops needing large amounts of water, have stimulated over-abstraction of groundwater resources and degraded water quality, both of which threaten critical aquatic ecosystems. Although many countries in this sub-region have made excellent progress meeting current demand for water and sanitation services, water and sanitation systems must be expanded to serve another 62 to 76 million people to meet the Millennium Development Goals for safe water and basic sanitation by 2015. Meeting these needs requires developing new water resources, reallocating water from agriculture for urban and industrial needs, and improving water use efficiency.

CHALLENGES IN SUB-SAHARAN AFRICA

Sub-Saharan Africa is struggling to meet the Millennium Development Goals to halve the proportion of people living without sustainable access to safe drinking water and basic sanitation by 2015. Although access to water in rural areas increased by six percent between 1990 and 2004, access in urban areas dropped by two percent. Africa has experienced an annual growth rate in urban populations of almost five percent per year over the past two decades, one of the highest rates in the world. Most of that growth has occurred in slums and peri-urban areas with no access to basic services. A burgeoning population and limited financial and technical capacity at the national and local levels, exacerbated by conflicts throughout the region, are stressing already weak systems. While some countries in sub-Saharan Africa have made great strides in developing the necessary policy framework to devolve decision-making and responsibility for providing basic water and sanitation services to the local level, funding from the national government does not always follow. Local capacity to plan for and manage services is limited; without strong support from the national level, local government institutions often cannot fulfill their obligations to deliver services.

PROGRAM OBJECTIVES AND THEMES

ABRI's goal was the transformation of the culture and governance of water resources in the Middle East and Africa. It had four primary objectives:

- **Promote transboundary water cooperation to improve water security**. ABRI supported activities that built confidence and fostered cooperation among riparian states. It worked with regional organizations, the Euphrates-Tigris Initiative for Cooperation (ETIC), the American University of Beirut, and country-level entities in Iraq, Syria, and Turkey to improve cooperation on the management of the Tigris-Euphrates Rivers.

- **Improve water resources management**. ABRI supported activities to strengthen regional institutions and initiatives to improve water resources management and sector governance.

Since such a large proportion of the freshwater in any country is used for irrigation, the program focused, in part, on the sustainability of water user associations (WUAs) through business planning. Other prime areas of focus included developing strategies for using treated wastewater for agriculture in Morocco and assessing basin resources in Yemen.

- **Improve access to clean water and sanitation**. The core of ABRI's efforts was in water supply and sanitation, reflecting USAID's keen interest in and commitment to this critical demand. ABRI increased its reach and impact by working with regional water utility associations, selected water utilities, municipal and national governments, foundations, and private sector partners to test and share successful approaches for expanding access to clean water and improved sanitation services, improve utility cost recovery and operations, and devise creative solutions to expanding services to poor neighborhoods and villages. In support of the MDG goals, ABRI worked closely with the newly launched Arab Countries Water Utilities Association in partnership with GTZ and the International Water Association and supported a utility twinning between the Uganda National Water and Sewage Corporation (NWSC) and the Southern Sudan Urban Water Corporation (SSUWC) through the African Water Association. It designed and coordinated water, sanitation, and hygiene (WASH) trainings for USAID staff across Africa and prepared a WASH programming manual for USAID mission staff. It advocated for the use of microfinance as an alternative financing tool in association with the Bill and Melinda Gates Foundation, the Aga Khan Foundation, and others in high-profile international venues. ABRI, with assistance from the World Bank Institute, commissioned a new publication, "The Manager's Non-Revenue Water Handbook for Africa: A Guide to Understanding Water Losses," and launched the publication to great acclaim at the 2010 African Water Association Congress in Kampala, Uganda. Finally, it worked closely with the fledgling Egypt Water Regulatory Agency, forging a link with the well-established Abu Dhabi Regulatory and Supervisory Board (RSB).

- **Improve water sector performance.** ABRI's broad mandate included supporting regional institutions and policy reform in the Middle East and Africa, working closely with the Middle East and Africa bureaus. Through partnerships and alliance building with regional platforms, it raised both its own and USAID's international profile in the water sector. In addition to those groups mentioned above, it formed a close relationship with the Arab Network for Environment and Development (RAED), a network of more than 200 environmental NGOs in 17 Arab countries, which included, among other things, convening national meetings on climate change. ABRI also assumed the lead in organizing technical panels at the Stockholm World Water Week in 2008 and 2009 and in the Fifth World Water Forum in Istanbul in March 2009. It organized a Future Water Leaders Program for 25 mid-level water professionals from seven Arab countries to prepare them to assume positions of responsibility in government, academia, foundations, and the private sector. ABRI also supported efforts by USAID and the Department of State to design the Middle East Center of Excellence on Water, an initiative launched by President Obama in June 2009 in Cairo, and generally supported the Africa and ME bureaus as directed by USAID.

IMPLEMENTATION APPROACH

Based on DAI's experience carrying out the FORWARD project and other successful regional programs, ABRI incorporated the following principles into activity planning and implementation:

- **Look ahead.** Because ABRI worked within a limited time frame of three years, it incorporated approaches that attracted support with the greatest potential of being sustained by governments, the private sector, and NGOs beyond the life of the program.

- **Treat program funds like venture capital.** ABRI funding was used both opportunistically and imaginatively to expand the presence and impact of the program.

- **Create a shared vision.** ABRI employed a consultative, collaborative, and inclusive approach in working closely with USAID missions, host governments, other donors, the private sector, and NGOs to shape activities and build broad-based support.

- **Build capacity.** ABRI channeled its efforts through existing regional and national institutions to strengthen their capacity to carry out and sustain activities to improve water resources management.

- **Generate recognition for ABRI beyond USAID.** ABRI conducted a communications and outreach program that reflected wisdom based on experience and knowledge. It worked with diverse regional and national organizations to develop and disseminate messages and information that generated interest and support from a broad array of stakeholders for actions to improve water resources management.

- **Mobilize a network of national champions for water sector reform.** We mobilized this network from countries participating in ABRI and used this network to advise on program priorities and implementation strategies while potentially helping them to advance ABRI-supported initiatives in their respective countries. This group served in helping share lessons learned generated by ABRI and other related initiatives in the region and around the world.

DEFINING "REGIONAL" FOR ABRI

For ABRI, regional meant a focus on approaches and activities that resonated across national boundaries and that were implemented in several countries, at a minimum, in the Middle East and Africa. We were particularly interested in identifying and addressing those water resources issues that were relevant for both the Middle East and Africa, as a way to achieve maximum impact, while recognizing that some issues were pertinent to one region or the other. If they had widespread significance, they were seriously considered for inclusion in the program. Thus, ABRI focused on "common issues," such as the lack of river basin collaboration on data management, the instability and short-life of water user associations, the absence of viable regional entities in the sector, and the lack of well-defined plans for using treated wastewater for agriculture in most Arab countries.

Regional also refers to our targeted audience. We sought especially to work with and through regional platforms, while recognizing that ABRI also needs to work at an individual country level to succeed. Thus, regional platforms were critical players in disseminating lessons and harnessing widespread support and buy-in. Individual country level programs were equally central players as ABRI used their on-the-ground experiences to showcase good practices.

IMPLEMENTING REGIONALLY

ABRI's regional mandate was different from most other programs that are called regional. The latter may work in many countries simultaneously, but each of their activities is usually tied to one country, rarely drawing together several on a specific effort. ABRI's focus was regional, and its activities were intended to encourage the joint engagement of regional institutions, governments, nongovernmental entities, and experts. ABRI would not have been able to fulfill its

vision if it had allowed itself to become stove piped—that is, working on a bilateral basis with countries in the Middle East and Africa.

ABRI pursued its regional mandate in a variety of ways by:

- **Encouraging the ME and AFR Bureaus and OMEP to reach out to missions** in the Middle East and Africa, actively drawing them into the program as a group through cables, meetings, and regular updates;

- **Attempting to integrate its efforts with the key areas of the full OMEP team**, beyond water: public-private partnerships, democracy and governance, and communication, which directly supported ABRI goals and interests;

- **Supporting regional platforms as our frontline for implementation**—such as ACWUA, ETIC, Africa Water Operator Partnership–that proved effective at reaching out to a number of countries and established an immediate audience for sharing lessons and implementing good practices;

- **Emphasizing the implementation of lessons learned and good practices** that covered the wide range of ABRI efforts in transboundary river basin cooperation, water use efficiency, and improved water and sanitation access, drawing from the Middle East and Africa, as well as more broadly;

- **Selecting activities carefully that resonated regionally** and required the participation of more than one country in joint or parallel efforts, such as the Future Water Leaders Program and the RAED climate change workshop; and

- **Recruiting multinational technical teams for assignments** that had male and female members from the Middle East and Africa, reflecting ABRI's regional goals.

BEING "BOLD"

We were told repeatedly by USAID that ABRI implementation ought to be bold. In the context of carrying out a program that addressed politically sensitive issues, we believe that ABRI was bold by:

- **Convening forums that encouraged the participation of mixed stakeholders.** In these forums, the results were not easily programmed or anticipated, but free dialogue on matters of serious consequence related to water were valued and encouraged.

- **Tackling issues that others shy away from.** As part of our technical program, we selected some water resources issues where there had been little progress or traction because they are highly contentious. We recognized that these issues might be of the highest priority even though they have been neglected because of strong and divisive interests. ABRI took the risk and incorporated these issues into its program. These efforts sometimes did not succeed. A good example is our work on transboundary aquifers.

- **Creating transformation.** Our goal with ABRI was to effect real and lasting change. We sought a transformation in the culture and governance of water. We believe that ABRI made a serious beginning in this area by establishing creative alliances between new kinds of stakeholders. We were bold because we offered this approach as an integral part of ABRI's

implementation and recognized that if we did not create these alliances, ABRI would not have fulfilled its mandate.

CRITERIA FOR ACTIVITY SELECTION

Interest in ABRI and demands on its resources far outweighed what it could reasonably commit to carry out. The following is a set of criteria that ABRI used when selecting activities to implement. An activity had a high priority if it:

- **Was transformational and regionally relevant, leading to significant change.** Activities we implemented had to directly support the overall program goal: to foster transformational change in the culture and governance of water in the Middle East and Africa. If an activity seemed marginal or was not likely to have a permanent impact, then it was deemed to be outside our mandate and not a priority, however interesting it might have been. Funding was used opportunistically, focusing on efforts that culled lessons and best practices and permitted ABRI to disseminate and implement them on a regional level. To that end, the activities had to add to our knowledge base on water in the Middle East and Africa. The impact had to be larger than the activity itself.

- **Broadened alliances with the private sector, donors, and NGOs.** The success of ABRI depended, in large part, on its ability to establish and nurture alliances with the private sector and other key stakeholders. It developed these relationships as a means of ensuring the longer term viability of the Blue Revolution concept. Therefore, activities that were designed to bring the private sector and others key funders and stakeholders into ABRI naturally had greater priority than those that did not target a larger, more diverse audience.

- **Promoted dialogue among many stakeholders.** ABRI activities were deliberately selected to stimulate open and active dialogue among the broadest range of stakeholders possible. Again, we did not underestimate the critical role that regional platforms played in implementation, since they necessarily encouraged broad dialogue among members.

- **Fostered equity in access and service.** An important component of ABRI's efforts was improving the access of the poor to improved water supply and sanitation services. The program sought opportunities to promote equity by selecting activities that empowered the poor and gave them more control over the quality and quantity of water services. We saw ourselves as an implementation arm of the Paul Simon Water for the Poor Act.

- **Generated interest from other donors.** We established close working relationships with multilateral and other bilateral donors.

- **Provided entry into a new country.** ABRI sought to maximize its physical presence in the Middle East and Africa, since we were told that the program could work in any country in the two regions, even those without USAID representation. We used the ME bureau and OMEP funding to enter and carry out activities in countries where missions devoted limited funding to the water sector as a way to stimulate their interest. We also used ABRI funds to work in countries without any USAID representation—such as Libya, Algeria, and Tunisia—where local conditions were of such importance regionally that not to carry it out would have been a major oversight. At the same time, we recognized that many of the most important efforts to date have taken place in countries with sizeable USAID water portfolios, such as Egypt, Jordan, Lebanon, and Sudan. ABRI needed to maintain a presence in these countries, as well, to build on this experience and use it as a firm foundation for our implementation.

2 MAJOR RESULTS AND ACHIEVEMENTS

OVERALL RESULTS AT THE PROJECT LEVEL

As originally conceived, the Blue Revolution Initiative was expected to transform the culture and governance of water in the Middle East and Africa. ABRI's mandate was to advance that transformation. We believe that in its brief three years of implementation, ABRI did exactly that. In advancing the Blue Revolution, ABRI:

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SUMMARY OF MAJOR RESULTS AT THE ACTIVITY LEVEL

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- **USAID staff in 21 mission and three regional program across Africa gained a good understanding of the issues and requirements in water, sanitation, and hygiene for project design in anticipation of increased funding in the sector.** ABRI, working closely with the USAID Water Team, designed four trainings for USAID staff in Dar es Saalem, Maputo, Dakar, and Nairobi

- **Numerous microfinance deals and partnerships have been made between funders and implementers.** ABRI took the lead working with the Bill and Melinda Gates Foundation, bringing together many parties in the US and Europe to advance microfinance as an alternative financing tool.

- **There is greater, widespread interest in dealing with non-revenue water by African utilities.** ABRI produced a non-revenue water handbook which has sparked great interest in dealing with this continuing serious problem on the continent.

- **ABRI helped raise the profile of USAID in the non-traditional international community of UN organizations, European entities, foundations, and regional water operator platforms.** ABRI identified and worked closely with many potential partners who were not traditional collaborators with USAID.

- **A cadre of mid-level water experts in the Middle East are more informed about current and future water issues and better able to assume positions of leadership in the future.** Through its Future Water Leaders Program, ABRI convened sessions bringing together future water leaders from across the Middle East, training them in technical and management issues.

- **The U.S. has made progress on the design and development of the Middle East and North Africa Water Center Network (MENA WCN), a key presidential initiative.** ABRI worked closely with USAID, the State Department, and the Interagency Water Group to consult with key stakeholders in the region and design this network of centers with them.

RESULTS BY ACTIVITY

The following are activity-level results:

Task 1: Promote Transboundary Cooperation

Transboundary Water Cooperation

- Data on the Tigris-Euphrates region were collected comprising diverse information on eighteen governorates in Iraq, four in Syria, and eleven in Turkey, then harmonized and made uniform in an original format.

- A work team from three universities in Iraq, two universities in Syria, and three universities in Turkey worked jointly and established a deep-rooted spirit of scientific collaboration that transcended political boundaries.

- The methodology developed in implementing the ETIC/ABRI activity attracted the attention of government officials to the positive outcome of riparian collaboration and raised the profile of ETIC and ABRI.

Task 2: Improve Water Resources Efficiency and Productivity

Water User Association Business Planning

- For the first time, water user associations are equipped with business models and business plans to orient them towards a business-minded approach to their association and activities.

- By introducing the WUAs to the range of possibilities available to them for partnerships, private sector initiatives, and member engagement, the WUAs have become more dynamic, proactive organizations, which will be needed to improve water management and for them to stay relevant and add value in the agricultural sector.

- Once the private sector better understood the potential of the WUAs, they were eager to establish mutually beneficial partnerships. The partnership with CropLife is a notable achievement, given their importance in the agricultural sector.

- Women can play a significant role in increasing incomes of rural households of the WUA members by producing home-made products. Any additional increase in a household's income would be considered an improvement in the value added of water resources and water-use efficiency.

Morocco Wastewater Reuse

- In close partnership with water agencies in Meknès, ABRI established the design of an innovative pilot project for reusing wastewater in agriculture. The agencies were part of a coordination wastewater reuse committee that was established by the governor to participate in the ABRI project. During the final workshop, and based on the ABRI achievements, it was decided to maintain and strengthen the regional committee. The committee is now officially responsible to continue planning and overseeing all regional activities related to wastewater management.

- The coordinating committee work showed that establishing a sound institutional setup and clearly defining the role and responsibility of every institution involved was a key for advancing wastewater reuse. It was demonstrated that assisting institutions responsible for strict quality control and health protection measures is important for project success. This experience is now being used by the Ministry of Water which launched a national study to design a strategy for wastewater reuse in agriculture. ABRI work is being used as a pilot case.

- Following ABRI project success, USAID/Morocco has made a commitment to implement reuse work through the MEC project in Meknès. In addition, the MEC project will disseminate the ABRI pilot experience to another region of Morocco in Oriental. Initial wastewater reuse studies in Oriental are already underway and are being implemented by ORMVAM, Regional Irrigation Authority.

- The tools, maps, and high potential irrigable land demonstrated by ABRI encouraged the agriculture department to take a new step. The DPA, Agriculture Regional Authority, decided to include in its planning a project for irrigating 2000 Ha of agriculture land using wastewater from the Meknès wastewater plant. This activity is planned as part of the new strategy: Plan Maroc Vert.

- The USAID/ABRI work provided the first regulations and guidelines for the safe on-farm use of reclaimed water in Meknès. It is intended for use by irrigators who already use reclaimed water so that they can avoid health risks to themselves, their families and the general public who may use their products. They provide detailed information and best practices, for Meknes WWTP effluent reuse, in five different areas: crop selection, irrigation activities, and agricultural activities, harvesting and post-harvest.

Task 3: Improve Access to Water Supply and Sanitation

Water Regulatory Reform

- The fledgling Egyptian Water Regulatory Agency (EWRA) has an established twinning relationship with the well-regarded Abu Dhabi Regulatory and Supervisory Board, a regulatory leader in the Middle East.

- Developed core operator competencies and certification exam questions and answers for an EWRA databank for laboratory analysis, wastewater operators, and water operators as part of the agency's long-term supervisory role.

- Modified and improved agency website for easy administration, developed a users manual, and trained agency staff and management on how to manage and update the website.

ACWUA Institutional Support

- ACWUA has a business planning process in place, approved by its Board of Directors and used by senior management as its operative document. The five-year business plan that was developed by ABRI covers the period from 2010 to 2014. The business plan provides a clear, concise means for ACWUA to communicate its Vision and Mission to its various audiences and stakeholders, its specific Strategic Goals for the planning period, and how it intends to achieve those goals. It also presents both the revenue expectations and expense forecast that ACWUA senior management is projecting as the basis for achieving the Strategic Goals. The business plan also defines a process that ACWUA can repeat in the future as it conducts annual updates of the Business Plan, by assessing how it performed against its defined interim milestones and what changes need to be made to the Business Plan for the subsequent five-year period. To aid this process, the Business Plan contains a computer-based, spreadsheet model that accommodates data input, cost, and revenue assumptions that will allow ACWUA to consider new or different assumptions and to forecast their impact on the "business" of the Association.

- ACWUA was formally launched as a regional water and wastewater utility platform, i.e. the water operator partnership for the Middle East as part of the UN-Habitat network. The launching ceremony was held on July 30, 2009 in Amman and attended by members of ACWUA's Board of Directors, members from the private sector, representatives of funding agencies such as GTZ, USAID, and the French Development Agency (AFD), Jordanian and Arab officials, including the Jordanian Minister of Water and Irrigation. ABRI supported ACWUA by preparing the launch event presentation that was given by the Secretary General of the Association to audience members as well as covered the launching's costs.

- ACWUA has a heightened international profile, thanks to attendance and panel presentations at the World Water Week in Stockholm and the World Water Forum in Istanbul. In both, the Secretary General joined leaders of other regional water operator partnerships on these panels and in key meetings. ABRI also supported the participation of ACWUA in the RAED Climate Change workshop held in October 2009 in Cairo, Egypt.

- ACWUA has an expanded sponsorship base after ABRI's support in developing the sponsorship page for the Non-Revenue-Water specialty conference that was held by ACWUA in Morocco in January 2010.

- ACWUA has an expanded support base through the partnership of ABRI with the International Water Association (IWA) and GTZ based on a joint technical workplan. ABRI, IWA, and GTZ implemented the plan collaboratively, jointly sharing costs and personnel, such as in the case of the launch of the Cost Recovery Technical Working Group where IWA working group members met with ACWUA TWG members to develop an implementation strategy.

- Through assistance from ABRI, ACWUA will have a communications action plan and templates, informed by the approved business plan. This includes: an ACWUA newsletter in a standardized format, step-by-step process of issuing press releases, templates for a corporate identity package with templates for an ACWUA brochure or flyer, event-flyers, membership card, business cards, welcoming packages for new or potential members, and master slide design.

- Being a fledgling association, ACWUA requires well-trained and clearly directed in-house staff who can fulfill the association's many requirements and a consumer relations management system to help it communicate with members. ABRI helped ACWUA staff clarify their roles and responsibilities and to will help them determine the most appropriate consumer relations software that is consistent with its five-year business plan.

Utility Twinning

- Through the Africa Water Operator Partnership, ABRI fostered a memorandum of understanding between Uganda's National Water and Sewage Corporation (NWSC) and the Southern Sudan Urban Water Corporation (SSUWC).

- The twinning between NWSC and SSUWC focused on a diagnostic analysis of the structure and responsibilities of SSUWC and a comparison of its regulatory framework with NWSC's to support better utility operations.

WASH Trainings

- USAID staff representing 21missions and three regional offices in Africa gained a good understanding of the issues and requirements in water, sanitation, and hygiene in anticipation of increased funding for new projects in the sector.

WASH Programming Guidelines Manual

- Once approved, USAID missions will have their first-ever step-by-step manual for project design covering problem identification, project conceptualization, and component and activity identification. The focus is water, sanitation, and hygiene.

- USAID missions around the world will be better prepared to respond to additional WASH funding in their countries.

Microfinance as an Alternative Financing Tool

- Opportunity International has begun research on water and sanitation and has indicated its interest in conducting a project within the next year or two (2010/2011).

- The SEEP Network has started discussions with USAID to consider developing a Practitioners Learning Program (PLP) for MFIs to pilot microfinance for water and sanitation projects.

- Water.org will serve as a partner to CHF International and Triple Jump as they vet MFIs who can benefit from funding and capacity support.

- CHF International and Water.org are partnering on proposals in Africa and Haiti.

- WASTE and CHF International are exploring partnerships in India to find ways to augment the FINISH program, focusing on urban areas and leveraging Water.org's urban program in India. These activities will seek to leverage a $6 million global program with the Gates Foundation.

- CHF International and the Finnish Embassy are exploring how they can partner in Ethiopia to bring the Finnish Embassy's Community Development Fund model to the Somali area where CHF has a presence.

- Triple Jump connected with World Vision's water and sanitation (watsan) specialist who expressed interest in promoting watsan microfinance among their MFIs. Triple Jump shared that other investment groups have expressed interest in funding their Water Fund once it is launched.

- ABRI was also successful through its microfinance and general alliance building activities to capture the interest of the European Union Water Initiative – Finance Working Group (EUWI- FWG) which approached us to learn more about what is needed to promote microfinance in their upcoming 3-year strategy. ABRI set up a meeting with USAID's Carl Mitchell and John Wasielewski and EUWI-FWG's Chair, Johan Holmberg, and NGO member Stefan Reuter. In the meeting, the EUWI-FWG invited USAID to jointly design an online platform that could link water and sanitation service providers and interested microfinance institutions who wish to co-develop programs. Both parties were interested in this collaboration and a concept paper is in development.

Non-Revenue Water

- ABRI developed a non-revenue water handbook for utility managers in Africa drawing on case studies and key messages. It has been adopted by the African Water Association in cooperation with the World Bank Institute.

- ABRI helped achieve noticeably heightened interest in dealing with non-revenue water as witnessed at the 15th African Water Congress in Entebbe, Uganda in March 2010.

Task 4: Improve Water Sector Performance

Partnerships and Alliance Building

- The strategic partnerships with the International Water Association and RAED offer USAID access to programs, expertise and networks from two differing, yet important, stakeholder groups (utilities and civil society) to build capacity and improve water management in the Middle East region.

- ABRI's focus on building strategic value networks in the Middle East not only enriched multi-stakeholder knowledge sharing on water management and alternative financing tools, but also led to new collaborations among ABRI-partners that extended beyond the original ABRI scope.

Building Awareness through International Outreach

- International outreach efforts at three international conferences and various regional events resulted in a noticeable increase in awareness and recognition of USAID as a key player in the development of water and sanitation programs by the international community.

- Regional roundtables and international conferences highlighting microfinance for water and sanitation as an alternative financing tool reached over 200 interested parties from the microfinance and watsan sectors, demonstrating USAID's convening power and leadership on the topic. ABRI attracted high impact / high profile organizations such as the Gates Foundation, International Water and Sanitation Center, and European Union Water Initiative – Finance Working Group to discuss how to get to scale and in the process, ABRI created a knowledge exchange platform that led to new partnerships being developed among network participants.

Design of the Middle East and North Africa Water Center Network (MENA WCN)

- Through meetings with ABRI, key stakeholders in the Middle East became familiar with the initial plans and design for the Middle East network of centers of excellence.

- Working with the Interagency Water Group's design sub-team, prepared the initial designs of the MENA WCN, growing out of a major initiative first articulated by President Obama in Cairo in June 2009.

Future Water Leaders

- There is increased awareness of and support for expanding the expertise of middle-level water professionals who will assume senior-level positions of responsibility in the coming one or two decades.

- There is a better prepared cadre of mid-level water professionals in the Middle East who will assume positions of leadership in government, academia, NGOs, the private sector, and donors in the future, having been exposed to new technical solutions and management approaches.

- There is a budding network of young water professionals from nine countries in the Middle East who are now sharing experiences and challenges, looking for help to solve immediate work-related problems.

- A cluster of European and international entities are now working together to develop programs targeted as middle-level water professionals.

3 LESSONS LEARNED

Overall, the major lessons learned from the three years of ABRI implementation are the following:

- **Implementing regionally is different from implementing in a region.** USAID is by and large a bilateral agency basing development assistance on direct relationships between a mission and a host country. Our years of experience implementing USAID regional programs have focused on designing and carrying out activities in specific countries and have rarely brought together a number of countries for a single purpose. ABRI was significantly different from these previous efforts with a far different mandate. For the most part, its activities crossed national boundaries and drew together a number of countries facing similar problems. This mandate was far more challenging since it required an openness in the dialogue and a sharing of experiences – successes and failures – that was not common.

- **Different USAID bureaus have different agendas.** We started implementation on ABRI with an expectation that the ANE and AFR bureaus had a common understanding and vision of the program and that ABRI would be designed and implemented as a single effort with activities reaching across the Middle East and Africa. We anticipated that activities as disparate as groundwater management, water users associations, and future water leaders would draw together the two regions. This was not the case. In fact, only one efforts crossed the divide: support for water and sanitation utility associations. The reasons for this are partly historical. Although the ANE Bureau has been deeply involved in larger water issues, including those related to water and sanitation at a utility level, for decades, the AFR Bureau has tended to work at a community level dealing with water supply, often with non-governmental organizations (NGOs). The result was an overall program working on parallel tracks with little crossover.

- **There is a palpable hunger for training and skills building that cuts across the Middle East.** Even with relatively little outreach and marketing of the call for applications and only one month allowed between the time of announcement and the application due date, ABRI still received 105 applications for the Future Water Leaders program. The response from some countries, like Jordan and West Bank/Gaza, was stunning in both the number of applicants and the quality, pointing to the demand for opportunities such as Future Water Leaders. On the other hand, the response from the North African Arab countries (i.e., Morocco, Algeria, Tunisia, and Libya) was limited, pointing to the need for more extensive marketing of the program. The reception only confirmed our perception that experts in the water sector from all kinds of entities want to strengthen their technical and management skills, and that by doing so, we would strongly encourage their continued involvement in and future contributions to the sector.

- **ABRI had to learn to talk the talk, besides just walking the walk.** The private sector's terminology and approach to building partnerships has a distinct flavor which differs some from that of the development world. It requires constant communication and team work between those involved in order to ensure we are all marching along the same path and

tapping into/leveraging everyone's specific skills. This was a challenge given the program structure of a split location team and limited time allocation for experts.

- **Investing in a single country may have an oversized payoff.** Although ABRI's activities were generally regional, there were two instances when the design of activities focused on a single country: wastewater reuse in Morocco and aquifer management in Yemen. At a time of quite large water portfolios in most USAID programs in the Middle East, Morocco and Yemen were outliers. They had either quite small or no water programs. ABRI support therefore served two purposes: (1) assisting a country with a specific need and (2) acting as a first step to an expanded water program in the future.

The following are activity-level lessons learned:

PROMOTE TRANSBOUNDARY WATER COOPERATION

Transboundary Water Cooperation

- The training workshops were an effective networking tool for senior and young riparian scientists, helping to establish partnerships within the riparian practitioners' community.

- Constraints resulting from limited resources were partly overcome through strong program management as well as the dedication and spirit of the riparian teams to perfecting and expanding the harmonized data inventory.

IMPROVE WATER RESOURCES PRODUCTIVITY AND EFFICIENCY

Water User Association Business Planning

- It is possible to expand the activities of water user associations by establishing strategic alliances with different partners and clients, in particular those leading to improved valuation of water used for agriculture. However, this may first require changes to the WUAs' statutes and the establishment of clear texts that govern contract farming and the aggregation process.

- WUAs can be used as a vehicle or a platform to raise farmer's level of awareness related to pure technical issues such as drip irrigation technologies, irrigation scheduling, and disease protection, as well as business issues such as marketing and agribusiness.

- The Government's appreciation of the potential role that WUAs could play in promoting the efficient use of water resources is critical for the establishment of an enabling legal and institutional environment allowing the WUAs to become effective intermediaries between policy makers and the farmers.

- There is great willingness on the part of WUA members and different partners to collaborate when using a win-win approach. However, in order to ensure that these relationships continue into the future, written agreements must be created and a monitoring system put in place.

- The private sector interest in collaborating with WUAs depends significantly on the total size of the WUA's holdings. In Egypt where the holdings are tiny, it is more difficult to engage the private sector than it would be in Morocco where the WUA holdings are somewhat larger.

- Business models and business plans are not easily transferred from one WUA to another, though it is sometimes possible depending on the situation. The inability to transfer such documents stems from environmental changes that vary by region, the intrinsic characteristics of the WUA (land statutes, SAU, dominant association members, socio-cultural context…), commercial network, and agro-industrial interactions, but just as importantly by the WUA's vision and members' priorities. Taking all these factors into consideration during the business modeling and business planning process is a key aspect of a participatory approach, which by its nature implies that the members themselves must be strongly involved.

Morocco Wastewater Reuse

- The coordinating committee work showed that establishing a sound institutional setup and clearly defining the role and responsibility of every institution involved was key to advancing wastewater reuse. In addition, assisting institutions responsible for strict quality control and health protection measures is important for project success.

- Involving farmers and the local community in the decision-making process and in the management of perimeters irrigated with treated wastewater was regarded as the next project step. A Water user association will be created in the target pilot zone.

Yemen Basin Management

- Demand for water in Yemen is exceeding its availability. More USAID investment is required in the Yemeni water sector.

- Underutilized and talented Yemeni experts are available and can be engaged to make an important contribution to their country's water sector.

- Partnering with the NWRA as the representative for multiple ministries and other Yemeni entities was very successful.

IMPROVE ACCESS TO WATER SUPPLY AND SANITATION

Egypt Water Regulatory Reform

- Political constraints and financial conditions vary so widely from one country to another in the Middle East that it is difficult to transfer regulatory strategies from one to another.

ACWUA Institutional Support

- The lack of a technical counterpart in the association posed an impediment to the quick and efficient implementation of activities. As such, for the work to have flowed easily and efficiently, it was essential to recruit the staff required for the association's successful operation.

- The association's needs and priorities evolved throughout the life of the project, which in turn changed the project's priorities for implementation. As such, the flexibility provided in

the scope of technical assistance was much needed to accommodate the changing priorities as well as the available resources within the association to work with on the project.

- The fact that the association is a regional body requires large amounts of funding for any meeting involving working committees composed of its members. Organizers need to adequately account for this when developing the project budget. Furthermore, and for the same reason, any activity that involved the participation of committee members from the Board of Directors or member utilities proved to be difficult to manage as they required proper planning and consideration of time, scope, and funding, in addition to having the commitment of the working committee members to participate in all meetings.

Utility Twinning

- Water utilities and their regulatory bodies (usually Ministries) are enthusiastic and supportive of peer to peer learning.

- USAID Missions, especially regional USAID Missions, and their implementing partners can play a useful catalytic role in structuring water operator partnerships (WOPs) that transcend national boundaries.

- Utility apex organizations, such as the African Water Association (AfWA), can also be champions of the WOP concept and can assist their members' network with each other and identify technical areas of common interest.

- Once the utility apex organization has networked its members and created a tentative WOP, a donor organization can play an essential role in assisting the emerging utility to carry out its responsibilities and the partnership.

- WOP arrangements capture local support for more effective regional integration and may well mobilize local sources of financial support, thereby enhancing sustainability.

Africa WASH Trainings

- The overwhelmingly positive evaluations from the 60 course participants demonstrates the success of the highly interactive method of the WASH course in which well thought out group exercises and "games" were used to reinforce major course "messages". This methodology should be used in any future ABRI courses and indeed for USAID courses as a whole.

- In every case, the ABRI-designed field trips were highly rated and were deemed an "essential" element of the course. In each case, the successful field trip depended on ABRI's existing informal partnerships with local sponsors (Dakar's water and wastewater utilities and NGOs, such as Water & Sanitation for the Urban Poor [WSUP] and Ecotact). For ABRI staff, one of the unexpected results was the fact that almost all USAID participants, both US Direct Hire and FSN, said that they had never before been in an African peri-urban or urban informal settlement (i.e. slum or "bidonville").

- Course participants had very little exposure to the water sector, and, with a couple of exceptions, no exposure to peri-urban or urban problems or to water utilities.

WASH Programming Guidelines

- Documenting and outlining the creative process of project design is a formidable task which calls for team participation and an iterative learning process.

- To remain an effective tool, the Programming Guidelines must be continuously updated with user feedback and to reflect legislative or budgetary changes.

Microfinance

- More rigorous documentation is needed on costs and quantifiable benefits for different stakeholders in order to make a convincing business case.

- Interest in microfinance for water and sanitation has gained increasing momentum over the past year alone and interest for collaboration is great, yet a mechanism in which to facilitate connections is still lacking.

- There is a need to educate microfinance institutions (MFIs), ministries, utilities, NGOs, and investors, yet initial discussions should be conducted within a discrete sector to establish a baseline of understanding and keep the discussion focused and productive.

- Creating sustainable microfinance solutions requires access to finance across the water and sanitation value chain, providing access to funding not only for demand-side (poor households and self-help groups), but also for the supply side (small watsan entrepreneurs, community service providers, MFIs and others requiring mezzo-level financing, loans and guarantees).

Non-Revenue Water

- Non-revenue water (NRW) is an excellent proxy and diagnostic for general utility asset management and is an excellent entry point for structuring WOPs and/or introducing a whole range of reform initiatives from internal management contracts, to customer care, to technology upgrades for leak detection.

- The NRW metric, along with the billing and collections metric, are the two most important indicators of the condition of a water utility and are essential features of a national or regional benchmarking program. A national regulator or national association of local water utilities can use these metrics to drive comparative reform programs.

IMPROVE WATER SECTOR PERFORMANCE

Partnerships and Alliance Building

- Creating strategic value networks results in generating a multiplier effect in development impact.

- Incentives for partner collaboration need to be established in order to ensure longer term sustainability of a strategic value network when donor-funding is no longer facilitating the network.

- Value comes not only from creating partnerships directly for a USAID program, but also in facilitating partnerships among other entities within a network that share a common development goal with USAID and/or are recipients of USAID funding.

- Before partnership activities can launch, program activities need to have enough scope defined up-front – concepts are good for assessing level of interest but not enough to engage in partnership discussions.

- Regional partnerships require more coordination and time to establish and manage than the typical partnership which targets a single, specific location.

- Joining with partners to co-sponsor seminars is a useful way to increase brand exposure, demonstrate USAID's partnership approach, and reduce overall conference marketing expenses.

Building Awareness through International Outreach

- Side events can be very successful in generating partner discussions on specific topics and do not require as much preparation or expense as hosted seminars.

- A booth provides a visual brand reminder of USAID activities but requires USAID staff commitment and knowledge of global water programs to ensure interested parties can get the desired information or be connected with the right people for follow-up.

- Generating an audience at press events requires pre-advertising and cannot rely on the conference coordinator's efforts alone.

Middle East and North Africa Water Center Network Assessment and Design

- USAID mission and U.S. embassies in the region must be closely and continuously engaged in the design and implementation phases in order to gain their support and trust.

- Political constraints often outweigh technical requirements in design and must be carefully considered as early as possible.

- While large pools of external funding can exist, they are difficult to access. Therefore, the financial sustainability of a new entity depends on donors committing adequate funding up front so the entity is not constantly scrambling for funds.

Future Water Leaders

- Mid-level leadership and change management training is still lacking in most water sector technical training programs in the Middle East and North Africa and despite it being of vital importance to the sector.

- ABRI's "mapping" exercises of existing Middle Eastern and selected global water training programs revealed substantial interest in developing leadership training expertise similar to the FWL model.

- While no existing training institutions provide a perfect fit for the FWL model, a number of regional institutions and donors would welcome a continuation of the dialogue and the opportunity to structure a future partnership along these lines.

- FWL course content should be developed jointly with the host institution so that they "own" the material and can replicate it as appropriate.

Africa Bureau Support

- ABRI proved to be of great value to USAID/Washington's Water Team, especially the Africa group, in providing wide-ranging, high quality "field support" in writing and researching background notes and papers as appropriate and in providing editing, lay out, and printing services.

- In selected cases, ABRI provided similar field support to missions, such as working with USAID/Sudan to enable them to support the WOP with Uganda and to prepare to incorporate the WOP initiative into their mission program portfolio.

4 TASK 1: PROMOTE TRANSBOUNDARY WATER COOPERATION

1.1 TRANSBOUNDARY RIVER BASIN MANAGEMENT

Introduction

The Tigris and Euphrates (TE) region extends geographically over parts of six countries: Iran, Iraq, Kuwait, Saudi Arabia, Syria, and Turkey. Iraq, Syria, and Turkey are the prime riparian countries of the two rivers, while Iran is a country upstream of some of the Tigris tributaries. The TE Region covers about 800,000 square kilometers (about 300,000 square miles) and is located between Latitudes 26 - 40 North and Longitudes 37-52 East. The Tigris and Euphrates rivers

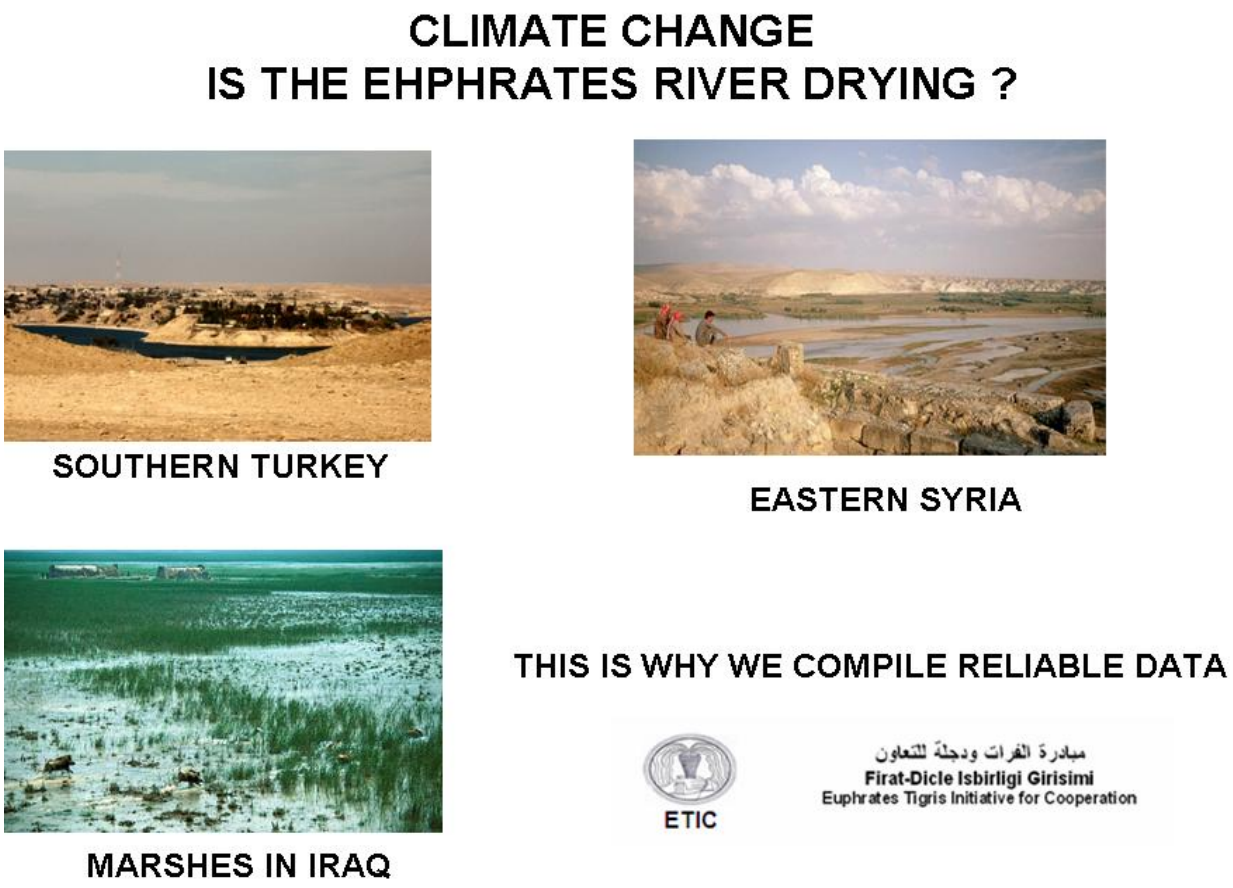
The Tigris and Euphrates Region

start in the 3,000 meter-high mountains of Turkey and discharge in the Persian Gulf. The source is Turkey's Anatolian Plateau with rugged mountains and valleys, a cool Mediterranean sub-tropical climate visited by autumn and spring rains and winter snows, and annual precipitation levels close to 1,000 mm (40 inches) per year. From there, the Twin Rivers run a circuitous path through Syria into a wide, flat, hot, and poorly drained Mesopotamian Plain. Here the climate takes on a more semi-arid to arid nature, where precipitation levels can average fewer than 250 mm per year, midday temperatures in summer may rise above 50° C (122 Fahrenheit), and relative humidity remains below 15 percent. Evaporation, a massive contributor to water loss in

the Mesopotamian region, exacerbates the salinity process in the region caused by excessive irrigation, adding to problematic land use policies in Iraq and Syria. The Tigris Euphrates region is a focal point in world affairs due to its geopolitical conditions, in addition to the diversity of its strategic, socio-economic, and hydrologic features. The political conditions of the region may be complex, but water, development, and hydropolitical issues are even more daunting.

Justification

This activity directly confronted one of the most critical issues in the TE region: the management and use of data. With water resources data almost always at the heart of any issue, misunderstanding, or conflict and despite the fact that good, collaborative management of water resources requires current information which can be used to recognize changes in water based



studies, data exchange among these countries was limited. As a result, suspicion around these issues has undermined cooperation for planning and development. ABRI saw an opportunity to address this challenge by looking for available and easily accessible scattered data and using them for integrated studies. Thus, the focus of this activity was to initiate joint action among riparian experts from Iraq, Syria, and Turkey by developing an inventory of available water resource data from all potential credible sources. The goal desired was for the states represented to be more inclined to establish partnerships for water resource management and development as a result of the collaborative activities of the riparian experts engaged.

The team identified opportunities that would help lead to such partnerships. The TE region, although formed by several countries separated by political boundaries, has a common agro-ecological system that is continuously threatened by risks from high evaporation, water scarcity, recurrent droughts, climate change, and seasonal variability of river flows. While the region faces risks of unilateral development programs where each country individually implements its own water and development activities, signs of *rapprochement* among the governments of Iraq, Syria, and Turkey have emerged in the last five years. ABRI hoped that cooperation among these countries would maximize joint benefits, reduce conflict, and lead to fair, balanced, and sustainable development practices, which in turn would provide social and economic benefits to all people of the TE region.

GAP Region – Ataturk Dam
Adyiaman, Turkey
September 16, 2007

Planning for the Activity

As a first step, the Euphrates-Tigris Initiative for Cooperation (ETIC), a grantee under ABRI, convened a Stakeholders Workshop and Conference in Istanbul, Turkey on September 11-13, 2007 that focused on opportunities for initiating "on-the-ground" projects in the TE region and presented potential project concepts to workshop participants for further consideration. Presenters included representatives from ABRI, the United Nations Development Program (UNDP), Stockholm International Water Institute (SIWI), and the New Eden Initiative.

ABRI then organized a workshop in Cairo, Egypt on April 5-11, 2008 to explore opportunities to start an activity in the Tigris Euphrates region with a goal of stimulating collaboration among riparian scientists. ETIC members, stakeholders, and faculty from riparian countries participated in the workshop. The outcome of the workshop was a project concept document that outlined the components of a collaboration on water resources knowledge management. Another workshop was later organized in Sanliurfa, Turkey July 19-22, 2008 and was attended by ETIC's founders, faculty from riparian universities, and NGO members. The outcome was an action plan to implement an activity entitled: "Collaborative Planning and Knowledge Development in the Tigris-Euphrates Region."

Following the Sanliurfa workshop, we explored implementation mechanisms with the institutions. We approached several organizations to explore their capability and interest in joining in the implementation of the activity and, given some of the constraints they faced, examined several options as a means of including stakeholders from the riparian countries in the activity. The Euphrates Tigris Initiative for Cooperation (ETIC) was selected for the implementation of the activity and the American University of Beirut (AUB) for rendering support.

The activity consisted of five tasks: Advancement and Outreach, Data Inventory, Data Harmonization, Capacity Building, and Clearinghouse. It was successful in sparking a sequence of efforts that led to greater cohesiveness among the riparian participants, attracting a cadre of investigators, and increasing international attention in both the collaborative process and the achievements of the activity.

Goals

- Encourage riparian collaborative actions through the joint design and implementation of a priority technical activity;
- Strengthen the role and influence of regionally focused entities, like ETIC, to operate productively at a regional level;
- Raise ABRI's profile through high yield efforts;
- Share information and lessons across national boundaries within the region;
- Support networks of experts for future efforts and partnerships;
- Stimulate a spillover effect to government officials from the riparian states so they might be more inclined to partner on technical activities in the basins; and
- Give evidence to the success of collaborative trans-boundary initiatives and the promise of ETIC and ABRI.

Objectives

- Increase knowledge about existing data and publications;
- Improve data management capabilities in universities, governments, and among other stakeholders;
- Produce a framework for data harmonization, methodology, standards and planning;
- Establish a clearinghouse to increase access to information on the TE region;
- Raise the profile of a collaborative initiative, both regionally and internationally; and
- Form a creative core team of young riparian scientists capable of supporting future projects.

Time Frame

The implementation time frame of March 2009 through May 2010 was set according to a strategy discussed and agreed upon among the team members.

Tigris-Euphrates Transboundary Activity Members

Iraq

1. Mukdad H.A. Al-Jabbari, Ph.D. Professor of Water Resources and Environment, Baghdad University
2. Mohammed Y. J. Al -Ani, Ph.D. Professor of Environmental Engineering, AlMustansiyria University
3. Maha Rashed A. Abdulhamed, Ph.D. Water Resources Engineering, Ministry of Water Resources
4. Suha AbdulRahman, Ph.D., Assistant Professor, Department of Software Engineering, Salaheddin University, Erbil

Syria

1. Lina Sergie Atassi, B.Sc , Architectural Engineering, Aleppo University
2. Eblal Zakzok, Ph.D.; Assistant Professor GIS and Hydraulic Modeling, Aleppo University
3. Ammar Wahbi, Ph.D, Professor of Agricultural Engineering, Aleppo University
4. Omar Farouk Mously, Ph.D. Agronomy expert, Aleppo
5. AbdelRaouf Shaddad, Ph.D. Agricultural Economy expert, Aleppo
6. Saad Barakat, M.SC. Environmental Engineering, Aleppo
7. Bashar Irhaiem, B.S, Information Technology, Aleppo

Turkey

1. Aysegul Kibaroglu, Ph.D. , Associate Professor, Department of International Relations, Middle East Technical University
2. Sahnaz Tigrek, Ph.D., Assistant professor, Middle East Technical University, Specialist in Numerical Analysis in Hydraulic Engineering
3. Dursun Yildiz, M.S., Civil Engineering, Water Politics Specialist, Manager of Ada Hydro-Energy, Strategy & Engineering Consultancy Company
4. H. Sebnem Duzgun, Ph.D., Associate Professor. and Vice-Chair Person of Mining Engineering Department, Associate Prof. of Geodetic and Geographic Information Technologies (GGIT)
5. Serkan Kemec Ph.D., Assistant Professor, METU, Specialist in Geodetic and Geographical Information Technologies
6. Reside Adal Dundar, Ph.D., Political Science and Public Administration
7. Onur Dundar, PhD. Candidate, Graduate Teaching and Research Assistant, Civil Engineering Department, Middle East Technical University
8. Ozge Gobelez, M.S in Civil Engineering, Project Engineer, Ada Hydro Energy Strategy Eng. Const. Inc.

Approach

Through an innovative approach and a spirit of team work, the experts implemented the activity with a view to producing direct impact on cooperation in the TE region. The approach employed scientific methodologies and educational means to jointly implement the five tasks of the activity and was based on an understanding between the core implementing parties of the individual goals and interests that had to be satisfied to reach joint agreements. This approach succeeded in identifying each party's positions; assessing their willingness to constructively participate; determining how all parties could benefit; and ascertaining where there had already been agreement or "common ground" among stakeholders. The team felt this was an important step in the process as it allowed them to reframe the remaining differences in need of solutions to make the terms of engagement acceptable to all the participants. The team then integrated these considerations into the approach in institutionally and politically appropriate ways.

ETCI/ABRI formed a team of experts from Iraq, Syria and Turkey to implement the activity by mobilizing the riparian academic community and practitioners. To keep them connected over large geographic distances, the teams established an electronic network to through which they conducted a comparative analysis of data sets according to the methods used to collect the data and the software used to express them in graphs and tables.

Given that the main data sources were from government institutions, ETIC/ABRI promoted dialogue, communication, and networking among the experts, government officials, and stakeholders in order to share information. As part of this effort, the Iraqi, Syrian, and Turkish teams convened several meetings in their home countries, communicated with each other through emails and teleconferences, and convened four in-person meetings in Turkey and Syria (Iraq, as a meeting venue, was not considered due to security considerations). The first in-person team meeting was held in Damascus, Syria on May 25-27, 2009; the second and third meetings were held in Ankara, Turkey on July 4-6 and October 1-3, 2009; and the fourth meeting was in Aleppo, Syria on January 15-19, 2010. During each meeting, the teams of experts reviewed, discussed, and coordinated the activity's progress and elaborated on the data inventory, standards for the harmonization of data, the clearinghouse, and the capacity building arrangements.

Achievements

The success of the activity stemmed from the joint effort put forth by the country teams to implement the five tasks. Broadly, the tasks were as follows: a regional and international public relations effort; an examination of publicly available data from all sources to establish the data inventory, identification of the kinds of data available, and a list and catalogue of this data with detailed cross-referencing; and data inventory, an important step that led to harmonization of the data and achieved consistency in data collection and analysis. Finally, ETIC/ABRI organized and implemented a training workshop for young scientists and established a clearinghouse for the compiled data. The specific achievements of the activity by task comprised:

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Firat-Dicle Isbirligi Girisimi
Euphrates Tigris Initiative for Cooperation

5th World Water Forum
Istanbul 2009

BRIDGING
DIVIDES
FOR WATER

ETIC Seminar on
Hydro-Solidarity
March, 2009

Task 1: Advancement and Outreach

The team decided that advancement and outreach were to be the first tasks under the activity instead of leaving them to the end. The purpose of Task 1 was to make various institutions aware of the value of the joint ABRI/ETIC activity and the partnership among the universities. The task achieved impact by disseminating information about the joint activity regionally and internationally. The following events took place under this task:

- ETIC/ ABRI convened a seminar at the 5th World Water Forum in Istanbul, Turkey March 16-21, 2009 in which ETIC and ABRI presented the activity to the international water community. In addition to the ETIC Steering Committee, team members, and Executive Director, John Wilson (USAID), Olcay Unver (UNESCO), Andres Jegerskog (SIWI) and ABRI representatives participated in the seminar.

- ETIC/ABRI convened a side event at the conference on “Applying WEAP as a Decision Support System (DSS) for Integrated Water Resource Management (IWRM)” organized by the Arab Center for Studies of Arid Zones and Dry Lands(ACSAD) and the German Federal Institute for Geosciences and Natural Resources (BGR) in Damascus, Syria May 25-27, 2009. In the side event, ETIC/ABRI gave a presentation on the activity focusing on collaborative planning and knowledge development in the Tigris Euphrates region.

- ETIC/ABRI held meetings in Aleppo, Syria on June 2-6, 2009 with representatives of the International Center for Agricultural Research in the Dry Areas (ICARDA), which included a

seminar for ICARDA personnel and a group of trainees from Arab countries on the ETIC/ABRI activity.

- Aysegul Kibaroglu and Faisal Rifai met on July 6, 2009 with the Rector of the Middle East Technical University (METU) in Ankara, Turkey. They presented the activity and discussed prospects for signing an MOU between ETIC and METU.

- ETIC/ABRI held a seminar facilitated by Faisal Rifai during SIWI's 2009 World Water Week (WWW) in collaboration with UNDP on August 20, 2009 to present the ETIC/ABRI activity. Four experts from Iraq, Syria, and Turkey presented some of the activity results achieved to date. The seminar agenda also included presentations by UNESCO, IJC, and UNDP.

- Faisal Rifai participated in a seminar on August 15, 2009 during WWW with representatives from Lebanon, Jordan, and Palestine where he presented ETIC's experiences, the ETIC/ABRI activity, and proposed establishing a similar initiative for the Jordan River Basin.

- Faisal Rifai made a presentation on the ETIC/ABRI activity on October 8, 2009 at a conference held in Beirut, Lebanon organized by the International Network of Basin Organizations (INBO) and the Mediterranean Network of Basin Organizations (MENBO).

- Aysegul Kibaroglu and Faisal Rifai met at the Turkish Ministry of Foreign Affairs in Ankara on November 13, 2009 with Ms. Ece Ozbayoglu Acarsoy, the Head of Water and Environment, and with her Deputy, Ms. Simla Yasemin Zakaya, to discuss prospects for ETIC's collaboration with government institutions with particular reference to the engagement of the Joint Technical Committee of the three riparian countries.

- ETIC/ABRI experts from Iraq, Syria, Turkey, and AUB met while in Aleppo in January 2010 with the Turkish Consul, the Rector of Aleppo University, the Assistant Field Officer of the United Nations High Commissioner for Refugees in charge of Iraqi refugees in Aleppo, and the Chairman of the Aleppo Chapter of the Syrian Engineering Syndicate. The experts presented the ETIC/ABRI activity and highlighted the results of their collaboration in the TE region.

Aleppo, Syria
January 2010

Task 2: Data Inventory

Under Task 2, the teams (1) identified existing databases focusing on the TE Region, (2) determined data gaps, (3) described the formats and standards of available data in the three countries, and (4) developed a comprehensive list of available data for the three countries with a view to storing them in a common database in standardized and fully documented formats. The study area of the TE region comprised eleven governorates in Turkey, four governorates in Syria, and eighteen Governorates in Iraq, which led the experts to establish the data inventory for the administrative boundaries where the Euphrates and Tigris Rivers pass.

First, the teams created a unified format and standards for data compilation from the three countries because many of the collected data sets were different. Additionally, they started and maintained a data exchange network through which they collected and processed a range of development-based data on the TE Region and assembled them to transcend physical and political barriers. After having searched for and compiled data from regional and international sources, the teams explored many potential themes around which they could standardize the organization of the data. The team settled on the following themes: country profiles, institutional structure of the water sector, hydrology and hydro-politics in the TE region, hydraulic structures, and public services. Additionally, the team sought to address cross-cutting water issues and also chose areas such as health, water supply and sanitation, electricity, agriculture, and water resources practices.

Using publicly available data, the teams then developed a data inventory that identified the kinds of data available and catalogued them with sufficient detail and cross-referencing to easily access the information. When gaps were identified in the existing data sets, the team explored them further in order to determine the basis for future efforts to fill them. The teams utilized a data collection program and strategy to determine the density of measuring points, monitor parameters, the types of measurements, and measuring and sampling frequency of the available data. As a next step, the teams determined the format for collecting and reporting data and the interface programs needed to convert the inventory data to the required format. To complete Task 2, the teams then advanced, developed, and enhanced the data sheets, taking into consideration the often poorly documented raw data, their content, coverage, producer, accuracy, or sources. Finally, the experts developed lists of identified data to be stored in a common database with standardized and fully documented formats.

The Marshland

ETIC

Task 3: Data Harmonization

The focus of Task 3, Data Harmonization, was to process the data inventory for harmonization, consistency of collection, and analysis. A key part of processing the data inventory was a survey of existing hardware, software, data collection methodologies, and data formats available through the participating universities**.** Using this information, the experts agreed upon a framework for data harmonization and how to represent the common data by thematic classification and on a governorate basis.

Following the data harmonization, the work teams selected a joint project on a trans-boundary subject for a case study and produced nine original thematic maps for the TE region in GIS format. They also collected data related to hydraulic structures in the TE region through a variety of procedures and processed and stored the data using available hardware platforms and software. Additionally, the experts defined the advantages and disadvantages of each approach and its deliverability into a GIS model, determining that the most practical GIS modeling software compatible with the existing hardware capabilities of the participating universities was the ArcGIS program from ESRI and open source GIS systems that are used world-wide.

At the end of the task, the teams of experts had established data harmonization forms, procedures, and processes for collection, storage, analysis, retrieval and data flow. The team noted that data storage systems in riparian countries should be made to handle the agreed data exchange format to allow data to be imported into modeling and analysis packages.

Task 4: Capacity Building

Task 4 focused on capacity building. The first step the team carried out was a training needs assessment among young scientists in the TE region. The results of the assessment pointed to the need for training on the principles and practices of GIS. In response to the results, the team organized a training for these young scientists and prepared training manuals and training curricula in consultation with a group of experienced trainers. When selecting the trainees, the organizers strove for diversity among the young professionals (who were between the ages of 22 and 45 years) to ensure a good balance among sectors, geography, gender and disciplines. The participants who attended the GIS training workshop in January 2010 were diverse, bright, dynamic, motivated young professionals and included participants from ten universities and five government institutions from Iraq, Turkey, and Syria. The program included sessions on the fundamentals of hydraulic structures, the institutional structures of the water sectors in the riparian countries, and principles and practices of GIS in the TE region.

GIS Training Workshop in Aleppo, Syria
January 2010

Task 5: Clearinghouse

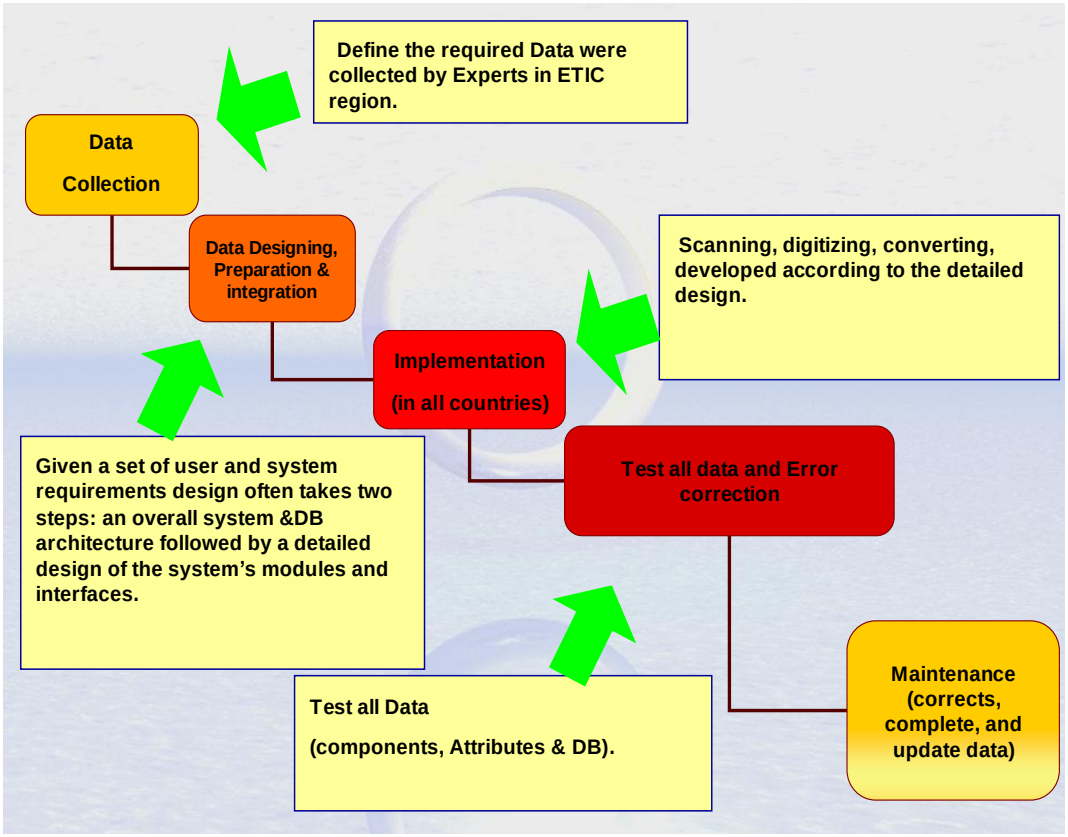
As the final task, ETIC has established a domain for a website: www.etic-org.net which will reflect the framework for the representation of the compiled data decided upon by the experts. This domain is a prototype of an internet-accessible clearinghouse as a source of information on the TE region in Arabic, English, and Turkish (and eventually Persian).

Results

Task 1: Advancement and Outreach

- Drew the attention of riparian governments to the value of collaborative planning;
- New institutions partnered with ETIC for collaborative efforts;
- Increased interest in Track 2 Diplomacy;
- ETIC was accepted as an active member in the World Water Council representing the Middle East as the only autonomous trans-boundary water organization; and
- Raised ABRI's profile among riparian academics.

Data Collection Process



Task 2: Data Inventory

- Defined eleven Governorates in Turkey, four in Syria, and eighteen in Iraq as the study area of the Tigris Euphrates region;
- Identified primary sources of data categories;
- Assessed data sources for content, level of detail, completeness and correctness;
- Collected data describing the countries' profiles, institutional structure of their water sectors; the hydrology and hydro-politics of the Euphrates Tigris Rivers, and climate parameters;
- Compiled data for the defined governorates on hydraulic structures, education, socioeconomic conditions, and health care services; and
- Prepared a bibliography on the TE region and compiled a list of technical terms.

Iraqi Governorates in the TE Region

Iraq		
Governorate	**Bölgeler**	
1. Basrah	Basra	
2. Muthanna	Samava	
3. Dhi Qar	Nasiriye	
4. Missan	Amara	
5. Najaf	Necef	
6. Qadissyiah	Divaniye	
7. Karbala	Kerbela	
8. Wasit	Kut	
9. Babil	Babil	
10. Baghdad	Bagdat	
11. Anbar	Ramadi	
12. Diyala	Bakuba	
13. Salah Ad Din	Tikrit	
14. Ninawa	Musul	
15. Sulaymaniyah	Suleymaniye	
16. Erbil	Erbil	
17. Kirkuk previously Al Taamim	Kerkuk	
18. Dohuk	Dohuk	

Syrian and Turkish Governorates in the TE Region

Syria		
Governorate	**Iller**	
1. Aleppo	Halep	
2. Raqqa	Rakka	
3. Deirezzor	Deyirzor	
4. Hassaket	Haseki	
Turkey		
Province	**Iller**	
1. Adiyaman	Adiyaman	
2. Batman	Batman	
3. Diyarbakir	Diyarbakir	
4. Gaziantep	Gaziantep	
5. Kilis	Kilis	
6. Mardin	Mardin	
7. Sanliurfa	Sanliurfa	
8. Siirt	Siirt	
9. Sirnak	Sirnak	
10. Malatya	Malatya	
11. Elazig	Elazig	

Details of Dams on the Tigris and Euphrates Rivers

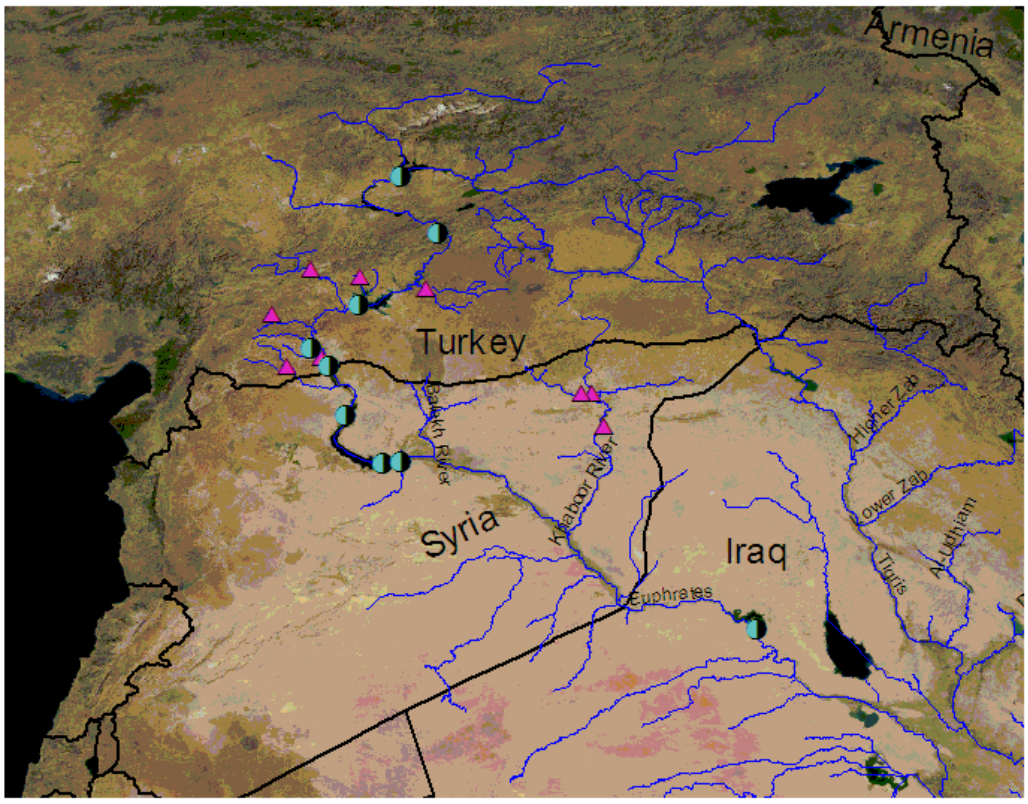
Dams on the Tigris River

Name	Governorate	Function		Coordinates		Year built	Max. water level	Height m	Water Storage Km^3	Electricity Generated MW
		Irr.	PG.	Lat.	Lon.					
Çınar	Diyarbakır	Irr.	-	37.82	40.42	1991	-	52	0.062	-
Cizre	Şırnak	Irr.	PG.	37.34	42.19	2012	406.5	51.4	7.4	640
Dicle	Diyarbakır	Irr.	PG.	38.34	40.02	1997	715.5	87	0.595	110
Ilısu	Şırnak	-	PG.	37.54	41.85	2006	525	135	10.41	1200
Kralkızı	Diyarbakır	-	PG.	38.37	39.99	1997	815.75	126	1.919	94
Mosul	Mosul	Irr.	PG	36.63	42.82	1986	338.5	113	14.53	750

Dams on the Euphrates River

Name	Governorate	Function		Coordinates		Year built	Max. water level	Height m	Water Storage Km^3	Electricity Generated MW
		Irr.	PG.	Lat.	Long.					
Keban	Elazığ	-	PG	38.8	38.75	1975	845	210	31	1330
Karakaya	Diyarbakır	-	PG	38.217	39.133	1987	693	173	9.580	1800
Ataturk	Şanlıurfa	Irr.	PG	37.483	38.317	1992	542	169	48.7	2400
Birecik	Şanlıurfa	Irr.	PG	37.05	37.833	2000	385	63	1.22	672
Karkamis	Gaziantep	-	PG	36.866	38.016	2000	340	29	0.157	180
Tishreen	Aleppo	Irr.	PG	36.366	38.183	2004	325	40	1.9	630
Euphrates	Raqqa	Irr.	PG	35.866	38.566	1978	304	60	14.1	800
Al-Baath	Raqqa	Irr.	PG	35.883	38.75	1990	256	14	0.09	75
Haditha	Alanbar	Irr.	PG	34.2	42.35	1986	150.30	57	8.28	660

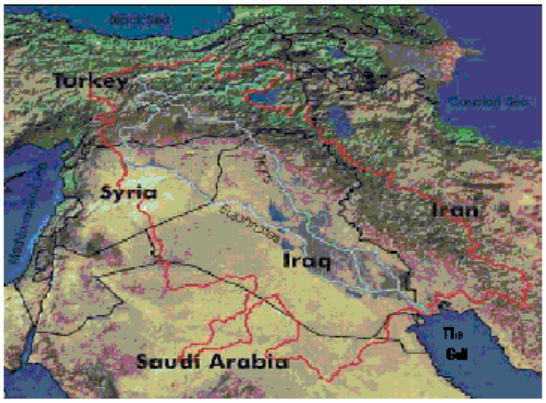
DAMS ON THE EUPHRATES RIVER SYSTEM



0 60 120 180 240 Kilometers

N

Euphrate-dams.shp
Euphrate-trib-dams.shp
Rivers.shp
Polbnd.shp



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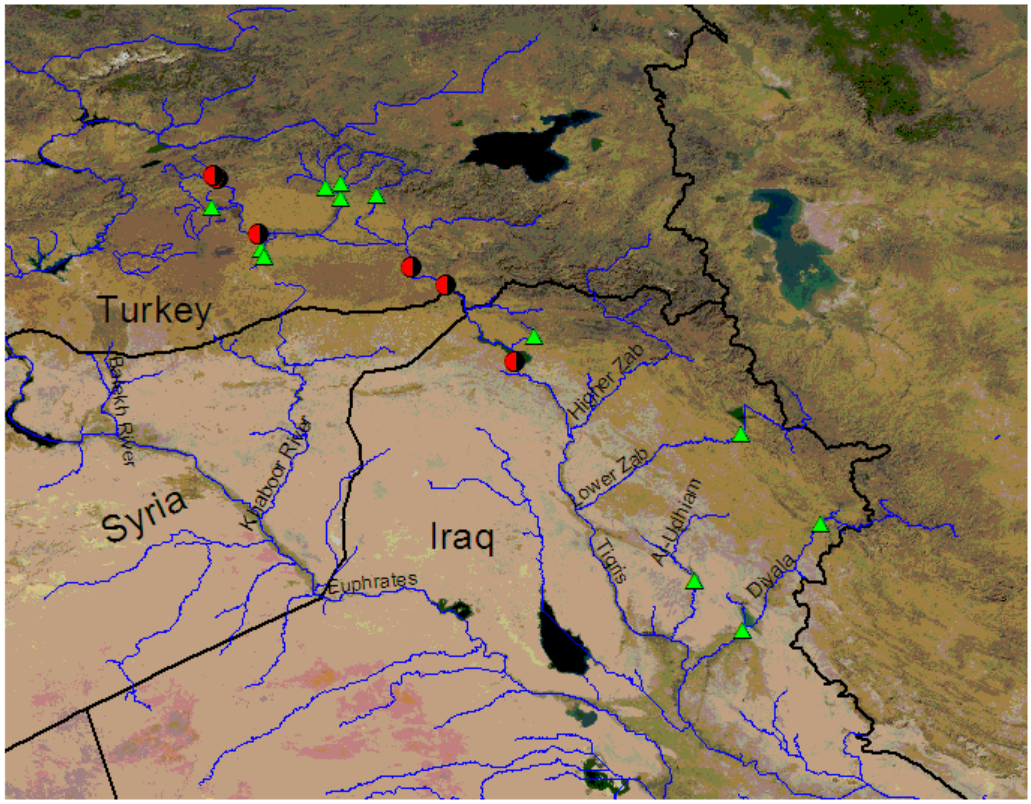
Euphrates Tigris Initiative for Cooperation

JANUARY 2010

DAMS ON THE TIGRIS RIVER SYSTEM



0 60 120 180 240 Kilometers

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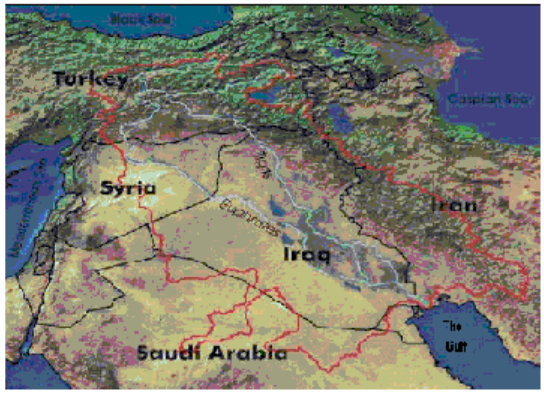
Tigris-dams.shp
Tigris tribut-dams.shp
Rivers.shp
Polbnd.shp



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Firat-Dicle Isbirligi Girisimi
Euphrates Tigris Initiative for Cooperation

JANUARY 2010

Task 3: Data Harmonization

- Produced nine thematic maps for the TE region in GIS format;
- Produced compatible data by thematic classification on a country and Governorate basis;
- Determined the content, level of detail, completeness, and correctness of data sources; and
- Assessed the inventory results and determined their advantages and limitations within each thematic category.

Task 4: Capacity Building

- Assessed training needs for the riparian practitioners;
- Enhanced knowledge of young scientists on the TE region;
- Improved young scientists' understanding of the fundamentals and practices of GIS;
- Exchanged experiences, established relationships, and built bridges among senior and young riparian scientists; and
- Formed a creative core team of riparian scientists.

Task 5: Clearinghouse

- Enhanced access for riparian, local, regional, and wider communities to data on the TE region;
- Increased availability of water-based data relevant to development and decision support concerning related issues through the clearinghouse; and
- As a result, university research and instruction in these and related areas may benefit.

MOSUL DAM (formerly Saddam Dam)

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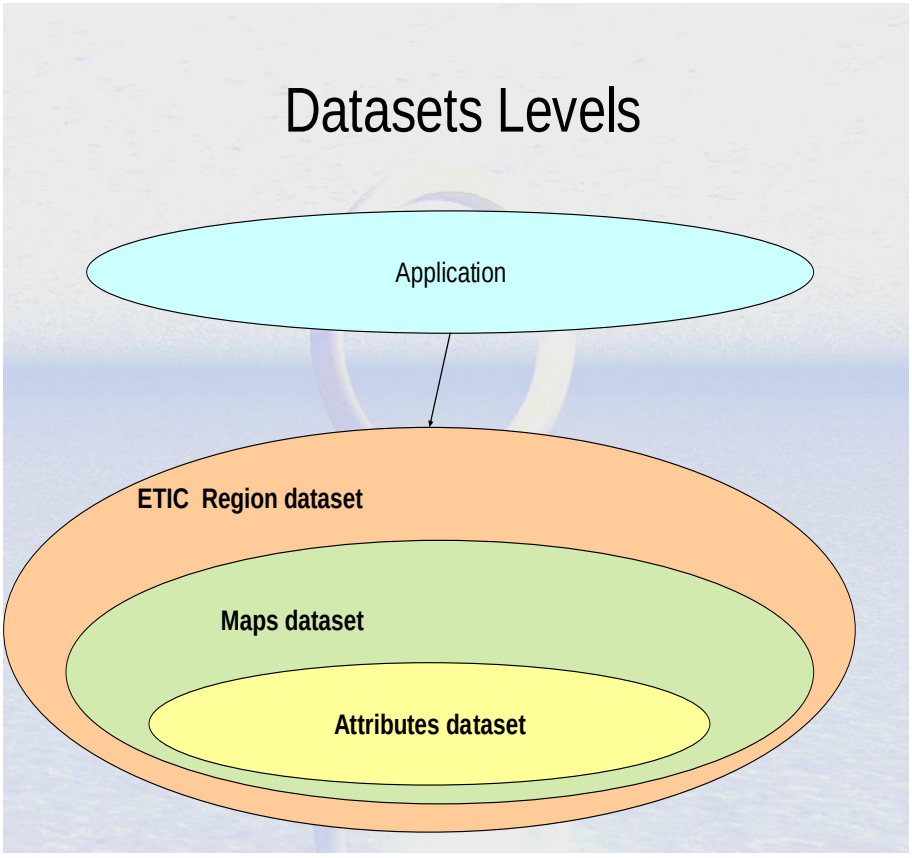
Euphrates Tigris Initiative for Cooperation

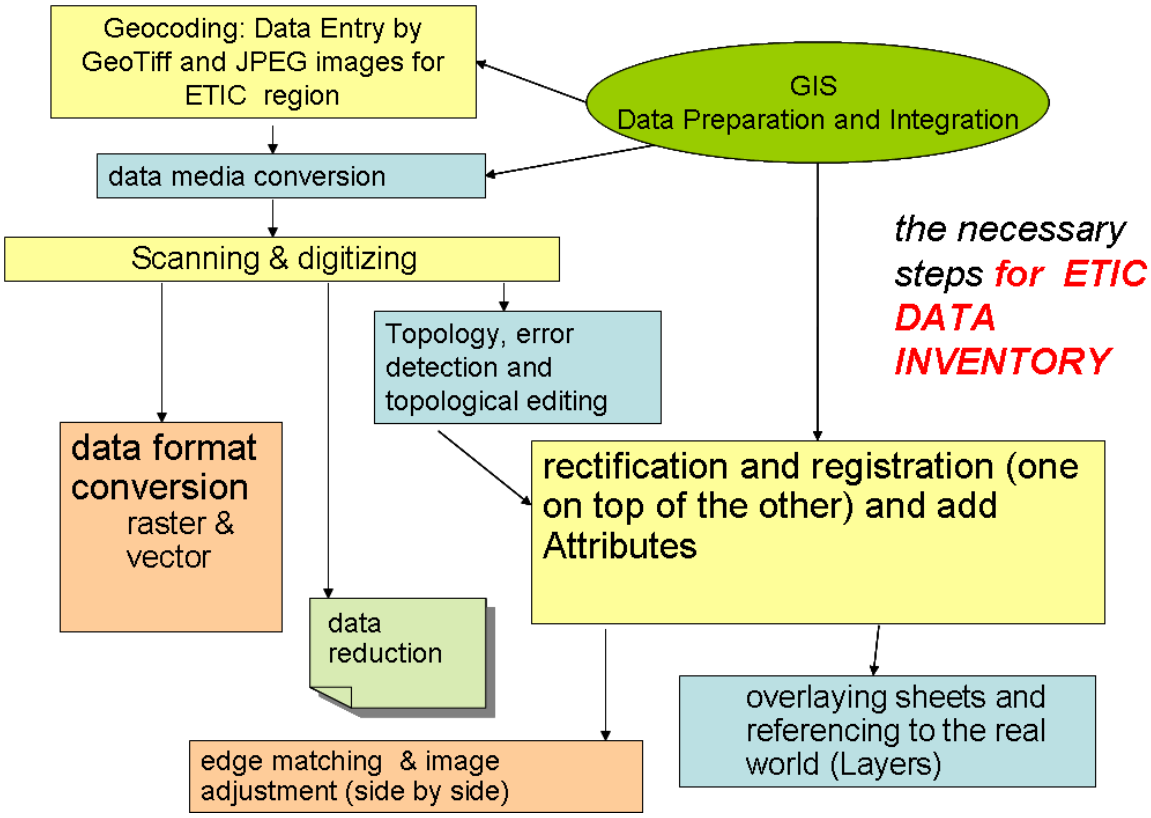
River: Tigris Governorate: Ninawa nearest town: Mosul
•Type: high-zoned earth embankment
•Crest width : 10 m; Length: 3650 m; Height: 100 m
•crest level: 343.20 m a. s.l *
•Year completed
•Max. reservoir level 338.00 m a.s.l
•Normal operation level (N.O.L.) 330.00 a.s.l.
•Max. Storage at max. reservoir level 13.14×10^9 m^3
•Normal storage at normal operation level 11.11×10^9 m^3
•Dead storage 2.95×10^9 m^3
Function: Power Generation
•Irrigation outlets: ------
No. of outlet and Diameter: -----
Discharge for each: --------
•Power House
• Number of turbines: 4 units,
Type : Francis turbine generator each 187.5 MW
Capacity 750 MW
•Spillway:
Type: 5 radial tainter gates
Crest level 317.50 m a.s.l.
Maximum design discharge at max. Reservoir level: 13000 m^3/sec.
•Bottom Outlets:
No. of outlets : Two bottom outlets with radial gates
Discharge: 2600 m^3/sec

•a.s.l : above see level

Survey date 2009

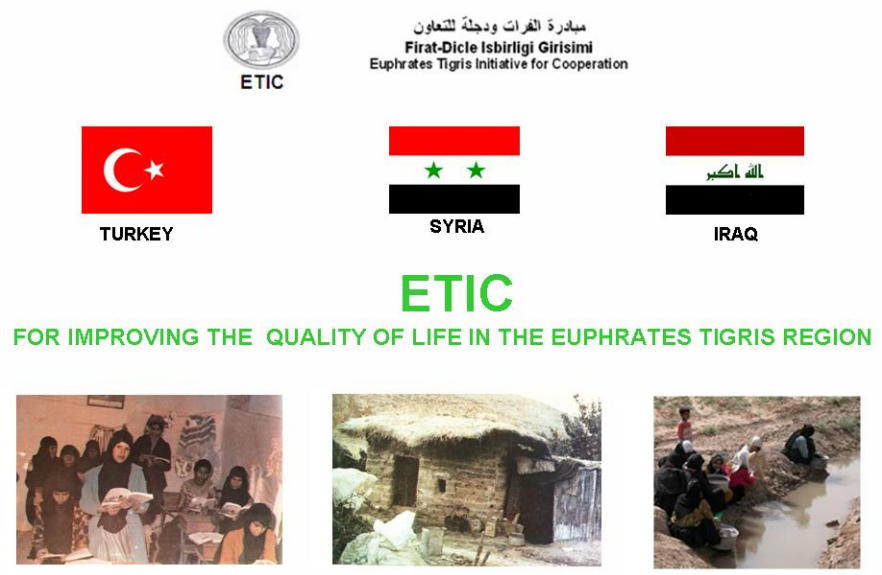
Steps for the Data Inventory





Lessons Learned

- The spirit of cooperation among the activity experts has become deep-rooted among them and was an effective means of producing a valuable source of data on the Tigris Euphrates Region.
- The network of senior and young scientists from the TE region, established by ETIC and ABRI, may be used in future activities.
- The autonomous nature of the riparian teams in carrying out the activity tasks helped to bridge some gaps that existed among official institutions.
- Capacity building was an effective tool for networking among senior and young riparian scientists.
- The success of the collaborative trans-boundary activity is evidence of ETIC and ABRI's promise for the future.
- ETIC/ABRI has informed the riparian officials of the activity results and some of them expressed interest in enlisting ETIC as a Track II diplomacy organization to render support within the TE region.
- The team's ambitions for further perfecting and expanding the harmonized data inventory were limited by the resources available.



5 TASK 2: IMPROVE WATER RESOURCE MANAGEMENT

2.1 WATER USER ASSOCIATION BUSINESS PLANNING

Introduction

Water user associations, often a contentious issue within the water sector, have been subject to high expectations followed by disappointing outcomes, with donor support dwindling as a result. Despite the apparent risk, ABRI sought to capitalize on WUAs' potential to make a significant impact on water management and water user efficiency and chose to engage them as an important partner in the project's efforts to transform the culture and governance of water in the Middle East and Africa.

ABRI began its engagement with WUAs through an assessment (Phase 1) that examined the status of water user associations in Jordan, Egypt, Turkey and Morocco, identified successes and failures, determined factors that accounted for their disappointing role, and assessed their potential to become drivers for commercialization and improved water management. The team concluded that water user associations in each of the four countries have one common role—water distribution—which they fulfill successfully. It was noted that in each country, they are the single institution that deals with all farmers in the command area, and thus could play a more varied and important role. Even with minimal support and no training, water user associations have successfully integrated water users—farmers—into an equitable institutional structure.

WUA members stand by their olive trees in the Tamellalt region of Morocco.

However, they are constrained by their legal and institutional context, which isolates them and limits their own expectations and the imagination of leaders and members alike. In each country, water user associations are given a limited mandate, whether or not it is proscribed by law, and virtually no opportunity to use their strength to greater advantage. Additionally, with most dimensions of farming and commercialization fragmented, farmers are left to compete for access to technical and marketing information and supplies. Extension people, input suppliers, marketers, and other stakeholders all appear to be oblivious to the potential of using water user associations as facilitators and conduits of information to link all water users to other agricultural stakeholders.

These findings presented ABRI with an opportunity to explore ways of engaging agricultural stakeholders with WUAs, enhancing their role while mutually benefiting both groups. We saw them as an important vehicle to reach all farmers, to aggregate production, improve quality, expand commercialization and, at the same time, give the farmers resources and incentives to

increase water use efficiency. Thus, ABRI's objectives became the creation of a multi-stakeholder dialogue to explore how water user participation energy could be harnessed to support improved water management, commercialization, and private sector initiatives, including private sector investment, export marketing, bulk purchases and sales, quality assurance, advanced technology, and tradable water rights.

Approach

In developing this activity, ABRI did not intend to follow the well-trodden path dealing with water user participation. WUAs are uniquely positioned to strengthen bonds between members while helping them build alliances with other stakeholders vital to their interests. We sought to explore how water user participation might stimulate change in economic growth, private sector investment, new management strategies, and irrigation partnerships and how these new initiatives might, in turn, stimulate improved water use efficiency. The intended result was a win-win approach benefiting WUA members and agricultural stakeholders alike.

The WUA activity was implemented in two phases: Phase 1, the assessment of WUAs in Jordan, Egypt, Morocco, and Turkey, took place between December 2007 and June 2008, and Phase 2, assisting WUAs to realize their potential as drivers for commercialization and water efficiency, during the period July 2008 through November 2009.

Phase 1, as described above, examined the status of water user associations in the aforementioned countries and identified successes and failures, factors that accounted for their disappointing role, and their potential to become agents of economic growth and improved water management.

Phase 2, informed by the results of Phase 1, took shape as a series of workshops that assembled representatives from WUAs, water agencies, the private sector, and international organizations. The purpose was to develop business models and business plans for each of the WUAs that would launch their new role as drivers of commercialization and water efficiency, establish systematic links with other agricultural stakeholders (such as agricultural extension professionals, input providers, and exporters), and develop their function as active conduits of information for their members. In doing so, WUAs would be better equipped to meet the needs of their constituents, thereby enhancing their role and credibility while serving the mutual interests of water uses and other stakeholders.

A participant at the first workshop in Marrakech, Morocco stands to express a point during a plenary session

The first meetings, held in Amman, Jordan (December 1 -3, 2008), Kafer-El-Sheikh, Egypt (April 27-28, 2009) and Marrakech, Morocco (May

12-13, 2009), were designed to set the strategic direction of the WUAs' expanded role. The stated objectives for these workshops were:

- To present and share the outcomes of the Phase 1 evaluations, with emphasis on identifying the main constraints hindering efficient water allocation and developing sustainable sources of income;

- To share regional and international WUA experience with the various stakeholders in attendance; and

- To develop a "roadmap", or action plan, to eventually arrive at business plans that would help in introducing the commercialization concept to WUAs.

During these first workshops, discussions centered on the participants' current activities, needs, interests, and resources, as well as identifying areas of mutual interest that could lead to future collaboration. The agenda included (1) presentations by the WUAs to share experiences and compare needs and constraints, while educating the non-WUA stakeholders about these organizations; (2) presentations by other stakeholders on their activities and potential areas for future collaboration with the goal of more efficiently and effectively reaching farmers; and (3) working groups designed to examine themes of mutual interest (credit, supervision and training, and marketing and commercialization) for all those involved that would then feed into the development of the WUA-specific business models and action plans.

Participatory working groups were a key aspect of the workshops as they signaled the start of the WUAs' expanded and proactive role for their members and as part of the agricultural community. The working groups were an opportunity for the WUAs to articulate challenges and develop "road maps" in which they proposed practical actions to tackle them while drawing on the expertise of their new partners and integrating strategic alliances into their solutions.

Developing a business model was the next step for the WUAs. We defined the business models as a general outline of the transactions needed for a WUA to generate income and make a profit. With the debut of this concept to them, the WUAs were introduced to ways of building a model that would enable them to integrate their potential products and services while taking both the customer and partners into consideration simultaneously. The resulting business models for select WUAs are presented in the sections that follow, each of which adhered to the same approach.

Three key considerations served as the foundation for the business models:

- Income generation and sustainability;

- Higher quality production for domestic and international markets; and

- Win-win options that could be established with the concerned government agencies to resolve water management problems.

The actual format and content of the business models consisted of interrelated elements (whose inclusion in the model depended on the appropriateness for the individual WUA) and included:

- Services (the value proposition that the WUA can offer products like water, marketing services, and extension services);

- Potential customers (exporters, wholesalers, other stakeholders in need of the products and services offered by a WUA);
- The channel for reaching customers;
- Relationships between WUA and their customers;
- Capabilities required to provide “high quality” products and services to customers;
- Activities required to fully utilize the core infrastructure; and
- Partners that leverage or influence the business model of the association.

Once the business models were complete, the activity arrived at its next key step - designing business plans in which each WUA would define its business goals and the plan for reaching them. ABRI did not simply wish to create these plans for the WUAs, force them into ratification, and assume that the WUAs would use them beyond the life of the project. Instead, the entire business planning process depended on the WUAs to evaluate their current operating environment through a Strength, Weaknesses, Opportunities, and Threats (SWOT) analysis, define their goals and priorities, and establish mutually beneficial partnerships directly with stakeholders to be included as part of their action plan. Done in this way, with the full cooperation of the WUA board members, the associations were most likely to adopt their business plan as a guiding document for the future. The result would be greater income generating opportunities for members and improved water use efficiency for the region in the short and long-term.

The main components of the business plans developed by the WUAs included:

- Introduction
- Description of ABRI activities
- Business planning approach
- Results of the stakeholders’ workshop and how they were used in developing the business plan;
- Proposed business model consisting of:
    - Descriptions of the WUA
    - Vision percent
    - Mission
    - Current activities of the association percent
    - Short- and long-term objectives
    - Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis percent
    - Risk Mitigation
    - Major marketing problems and solutions to overcome these percent
    - Relationships with other stakeholders and partners
    - Economic assessment for changing current cropping patterns

Achievements and Results

Morocco

ABRI began its activities in Morocco in May 2008 in collaboration with the Office Régional de Mise en Valeur Agricole du Haouz (ORMVAH). Two WUAs in the Tamellalt region (in the area of Haouz) were chosen for a pilot study: the Soultania association and the El Fath association. Details of each are presented in the table below.

Features of the Soultania and El Fath Water User Associations

WUA	Region	Founding Date	Total Surface Area (Ha)	Number of Members	Principle Crop
Soultania	Tamellalt	1992	4187	336	Olive trees
El Fath	Tamellalt	1979	879	172	Olive trees

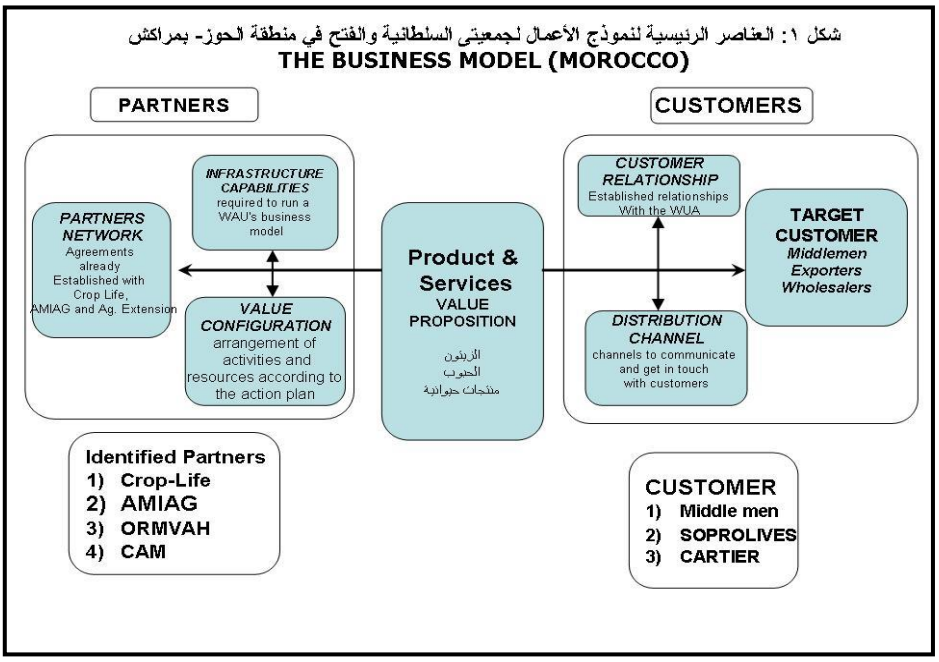
In total, ABRI held four meetings in Morocco – three focusing on the business models and business plans and a fourth "mini-workshop" to conduct a situation analysis of gender issues in the project's targeted area of Tamellalt. A multitude of partners from the public and private agricultural sectors participated in the activity, with many becoming strong partners for the WUAs at the close of the activity: USAID, ORMVAH, Institut Agronomique et Vétérinaire Hassan II (IAV Hassan II), Crédit Agricole du Maroc (CAM), Société Marocaine de Développement Agricole (SFDA), CROPLIFE, Association Marocaine de l'Irrigation par Aspersion et par Goutte-à-goutte (AMIAG), Société de commercialisation des équipements d'irrigation (IMPOSUR), Société de Production d'Olives (SOPROLIVES), Ministère de l'Agriculture, du Développement Rural et de la Pêche Maritime (MADRPM), Agence de Développement Agricole (ADA), Office Régional de Mise en Valeur Agricole du Haouz (ORMVAH), Office Régional de Mise en Valeur Agricole du Doukkala (ORMVAD), and Institut National de recherche Agronomique (INRA).

Women discuss how they are affected by current water use practices during the Mini-Workshop focusing on the gender issues of water.

The Soultania and El Fath Business Model

Given the similarities in Soultania and El Fath, they created a single business model that applied to both associations. As described previously, the team designed the business model to enable WUAs to integrate their potential products and services with both their customers and partners.

Soultania and El Fath Business Model



*Note: The partnership with CARTIER did not come to fruition.

Business Plans

The Soultania and El Fath business plans are too long to be presented here, but key points are presented below:

- Vision (for the next five years):
    - Install a complete drip irrigation system to improve water efficiency and decrease loss percent
    - Become an economically and commercial-oriented and financially sound organization;
    - Achieve the greatest possible levels of water efficiency, taking into consideration the infrastructure available percent
    - Utilize an integrated management system for produce and animal cultivation
    - Have storage and warehousing facilities for milk percent
    - Serve as a model for other WUAs in the region and across Morocco
- Mission:
    - Ensure equitable water distribution between association members
    - Maintain the irrigation system percent
    - Modernize the irrigation system
    - Promote agriculture in the WUA's region percent
    - Take the necessary steps to improve revenue
    - Selected short and long-term objectives:
    - Water: Safeguard this resource and minimize waste

- Commercialization: Have the ability to obtain the best prices for the WUA's products percent
- Partnerships: Be able to establish contracts with private sector operators percent
- Develop a sustainable irrigation network and system
- Become a revenue generating association for the benefit of the members

- SWOT Analysis:

  - **Strengths**: (1) Water resources are relatively significant when compared to other regions of Morocco. (2) Olive tree cultivation is well adapted to the region, as they have high water use efficiency and value added. (3) Legal recognition of the association statutes.

  - **Weaknesses**: (1) Limited valuation of irrigation water because of the gravity irrigation system and lack of a maintenance network. (2) Absence of management and training. (3) Land statutes and the predominance of non-titled lands that make it difficult to access credit.

  - **Opportunities**: (1) Government subsidies for the installation of drip irrigation systems. (2) ORMVAH's engagement, the relationship with SOPROLIVES with whom ORMVAH and ABRI have negotiated a process to aggregate WUA members. (3) The other partnerships developed through ABRI.

  - **Threats**: (1) Drought and decreasing water resources. (2) The market, specifically the difficulty of selling products and dealing with recurring drops in prices. (3) The price of production, which is often increased by the number of intermediaries involved.

- Potential areas for future partnerships:

  - Loans: Take advantage of low interest, long-term loans percent
  - Partnerships: Establish contract farming and ways of aggregating farmers (but involve a public sector entity to serve as legal counsel)
  - Collaboration: Collaborate with other associations percent
  - Training: Benefit from continuing education through the agricultural advisory service and private organizations
  - Drip Irrigation: All these points are preceded by the need to install a drip irrigation system

- Financial Analysis: The team completed a financial analysis for the installation of a drip irrigation system, as the current gravity irrigation system resurfaced throughout the business planning process as a major factor impeding water valuation and agricultural development. The cultivation of olive trees was used in the analysis as they occupy the largest surface area in the study region.

  The average profit margin of the two WUAs for one hectare of olive trees was found to be about 35,000 MAD under the gravity irrigation system and more than 44,500 MAD with drip irrigation. Water use efficiency was found to be 5 MAD/m^3 under the gravity system and attained 12.7 MAD/m^3 with drip irrigation.

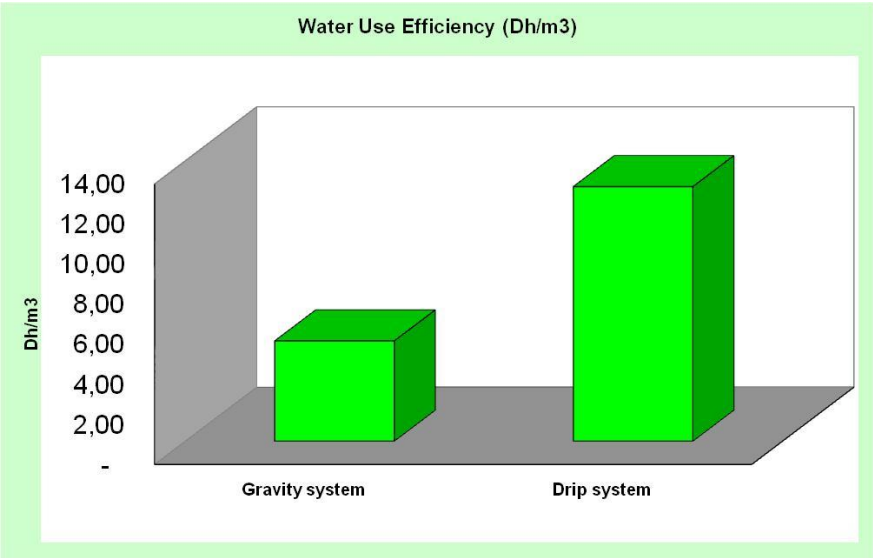
Financial Analysis for One Hectare of Olive Trees Irrigated by Gravity for Soultania and El Fath WUAs in Haouz Region

Items	القيمة	السعر	الكمية	الوحدة	
	Value (DH)	Price	Quantity	Unit	
Main product	52500	7.5	7000	كغم	المنتج الرئيسي
Operational costs					التكاليف التشغيلية
Manure	13700			متر مكعب	الاسمدة العضوية
Chemical Fertilizers				كغم\هكتار	الاسمدة الكيماوية
Mechanical labor					العمل الميكانيكي
Manual labor					العمالة اليدوية
Water	3738	7000	1	هكتار	المياه
Total Oper. Costs	17438			درهم DH	التكاليف التشغيلية الكلية
Gross Margin	35062			درهم DH	الهامش الربحي
Return to Water	**5.01**			درهم DH/M3	العائد للمتر المكعب

Financial Analysis for One Hectare of Olive trees with Drip Irrigation for Soultania and El Fath WUAs in Haouz Region

Items	القيمة	السعر	الكمية	الوحدة	
	Value (DH)	Price	Quantity	Unit	
Main product	67500	7.5	9000	كغم	المنتج الرئيسي
Operational costs					التكاليف التشغيلية
Manure	17000			متر مكعب	الاسمدة العضوية
Chemical Fertilizers				كغم\هكتار	الاسمدة الكيماوية
Mechanical labor					العمل الميكانيكي
Manual labor					العمالة اليدوية
Water	6000	3500	1	هكتار	المياه
Total Oper. Costs	23000			درهم DH	التكاليف التشغيلية الكلية
Gross Margin	44500			درهم DH	الهامش الربحي
Return to Water	**12.71**			درهم DH/M3	**العائد للمتر المكعب**

Comparison of Water-Use Efficiency between the Gravity and Drip Irrigation Systems



Shifting from the gravity system to drip irrigation would result in a profit margin of about 9500 MAD per hectare and two and a half times greater water-use efficiency. It should be noted that these figures did not take into account the fact that water economization would permit WUA members to cultivate uncultivated lands that had been left fallow due to lack of water. On average, more than 50% of the WUAs' lands are continually left fallow.

During the final dissemination workshop, the WUAs and the partners reviewed the business plans and commitments made by the WUAs partners:

- **AMIAG**: A study to determine the feasibility of installing an irrigation system on two farms for each of the WUAs free of charge. They also suggested the possibility of conducting trainings on installation, network design, and drip irrigation management for the two WUAs.

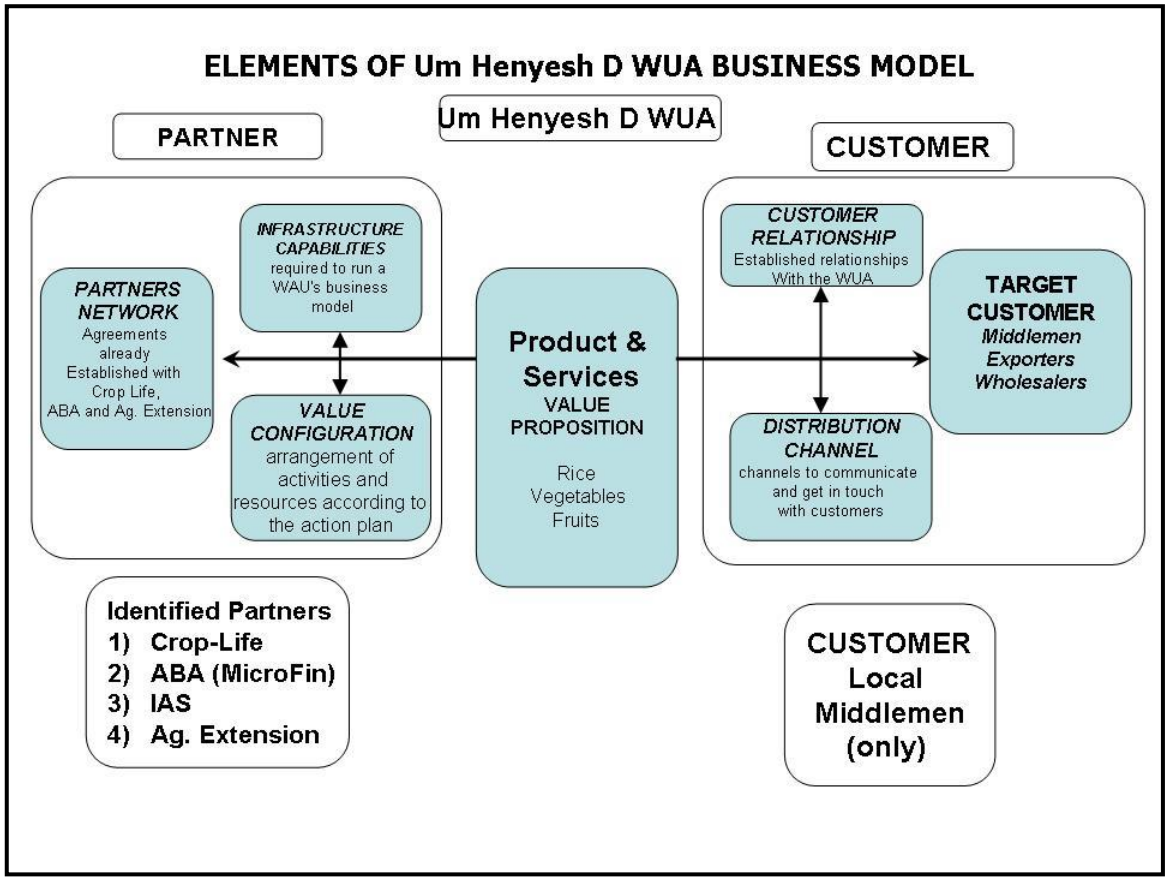
- **Crop-Life** established a training plan based on the needs identified by the farmers. ABRI and ORMVAH coordinated the first session on November 19th. From this point on, CropLife will be responsible for the other trainings.

- **SOPROLIVES**, as a member of the Soultania WUA, expressed willingness to aggregate the WUAs' members in order to take advantage of the ultra-modern, olive oil farm they recently established and the mass production unit that will be installed in the near future.

Egypt

In Egypt, ABRI chose the Um Henyesh D WUA and Bayda A WUA for the activity and followed a slightly different approach from Morocco that consisted of fewer workshops. The first workshop was held in Egypt during April 27-28, 2009 in Kafrr El-Sheikh with more than 50 participants in attendance, who included WUA members, representatives from the Irrigation Advisory Service (IAS), Extension Department, CropLife International-Egypt, the USAID-funded Life Project, Alexandria Business Association, and other participants from the local community. At the close of the workshop, the teams had drafted business models for each of the WUAs. The final business model for Um Henyesh D WUA is shown below. The chosen business model represented a general outline of the transactions needed for a WUA to generate income and make a profit. Additionally, the team developed action plans for the WUAs, which are presented below.

Um Henyesh D WUA Business Model



Action Plan for "Um Henyesh D WUA" and "Bayda A WUA" in Kafer El-Sheikh

Theme	Objectives	Activities	Responsible Entities	Timeframe
Agricultural Extension	1) Demonstrate new technologies 2) Increase farmer's income 3) Reduce the usage of pesticides and assure safe usage 4) Optimal use of agricultural remains	1) Training 2) Provision of technical information and support 3) Additional information on new high-value crops 4) Improve land leveling by the laser technology	WUA + Extension Dept in Kafer El-Sheikh + Dept of Land Improvement	May 2009 – April 2010
Developing Irrigation System in the WUA territories	1) Reduce water loss 2) Save agricultural lands 3) Reduce irrigation costs 4) Eliminate weeds	1) Training 2) Capacity building 3) Funding	WUA members + Any funding agency	May 2009 – April 2010
Irrigation efficiency and the optimal use of water resources	1) Reduce water loss 2) Reduce irrigation costs 3) Improve general hygiene	1) Install poles and electrical wires 2) Purchase electrical motors 3) Obtain licensing from local authority	WUA members	June – Sept 2009
Financing new projects	1) Increase farmer's incomes 2) Provide a social service to the poor community 3) Reduce unemployment	1) Livestock fattening program 2) Milking plan 3) Supporting widows and old people in the WUA	Funding institutions, Micro- financing (ABA)	May 2009 – April 2010
Capacity Building	Improve the capacity of the WUA	1) Training 2) Lobby for changing the institutional structure of the WUA 3) Networking with other associations 4) Exchange experience with other organizations	WUA members + Crop LIFE Int.	Year Round

Following the first workshop, ABRI held several brainstorming sessions to draft the WUA business plans in June, 2009 with board members of the two associations and participants from IAS, GTZ, and extension service. In full cooperation and engagement with the other stakeholders, ABRI produced a detailed business plan for the two selected Water User Associations (WUAs), Al-Bayda and Um Henish. As a result of the high degree of similarity in the structure and activities implemented by the two selected WUAs, the ABRI team produced a single business plan for the two associations. ABRI prepared the plan in Arabic following the outline presented earlier in this report and based it on the business model the team prepared at the first workshop. The detailed business plan for the two WUAs is not presented here due to length and language restrictions.

Jordan

ABRI held the first workshop in Amman, Jordan at the National Center for Agricultural Research and Extension (NCARE) in Baqa'a from December 1-3, 2008 under the patronage of the Minister of Agriculture. The inauguration session included opening speeches by the General Director of NCARE, a representative of the Minister of Agricultural, the secretary general of the Jordan Valley Authority (JVA), USAID, and ABRI Project Director. No business plans were developed for the Jordanian WUAs as greater opportunities were identified with those in Egypt and Morocco and funding and attention were directed towards those efforts as a result.

Participants from the first WUA workshop in Amman, Jordan

However, the workshop generated some key observations:

- It was for the first time ever in Jordan that various stakeholders came together to listen to the WUAs' issues and challenges in an open dialogue that represented a paradigm shift in the perception of the WUAs' role in Jordan.
- Government agencies and the WUAs demonstrated a high sense of ownership of the process which is of extreme importance to the sustainability of such an initiative.
- The Jordan Export Business Association was the strongest and most engaged private sector. However, much opportunity lies in engaging other private sector companies, including financing groups and input companies like irrigation, green houses, crop/seed, fertilizer companies, etc. What seemed lacking was the desired engagement and commitment of the private sector to work with the WUAs.


A participant debriefs on the outcomes of his working group's discussions.

Lessons Learned

- It is possible to expand the activities of water user associations (WUAs) by establishing strategic alliances with partners and clients, in particular those leading to improved valuation of water used for agriculture. However, as in Morocco, this may first require changes to the WUA's statues and establishing clear texts that govern contract farming and the aggregation process.

- WUA members and partners showed great willingness to collaborate when using a win-win approach. However, in order to ensure that these relationships continue into the future, they must create written agreements and put a monitoring system in place.

- Private sector interest in collaborating with WUAs depends significantly on the total size of the WUA's holdings. In Egypt where the holdings are tiny, it was more difficult to engage the private sector than in Morocco where the WUA holdings are somewhat larger.

- When WUAs and partners voluntarily sought collaborative relationships between both parties, documents governing these agreements were either missing or not clear, most notably those for contract farming and when undergoing aggregation.

- The Government's appreciation of the potential role that WUAs could play in promoting the efficient use of water resources is critical to establish an enabling legal and institutional environment allowing the WUAs to become effective intermediaries between the policy makers and the farmers.

- WUAs can be used as a vehicle or platform to raise farmer's level of awareness related to pure technical issues such as drip irrigation technologies, irrigation scheduling, and disease protection, as well as business issues such as marketing and agribusiness.

- Women can play a significant role in increasing rural household incomes for the WUA members by producing home-made products. Any additional increase in a household's income would be considered an improvement in the value added of water resources and water-use efficiency.

- Business models and business plans are not easily transferred from one WUA to another, though it is sometimes possible depending on the situation. The inability to transfer such documents stems from environmental variations by region, the intrinsic characteristics of the WUA (land statues, SAU, dominant members, socio-cultural context…), commercial network, and agro-industrial interactions, but just as importantly by the WUA's vision and members' priorities. Taking all these factors into consideration during the business modeling and business planning process is a key aspect of a participatory approach, which by its nature implies that the members themselves must be strongly included and even favored throughout the process.

- While many WUAs in certain regions are functional, this is not universally the case, as some WUA members report a lack of engagement by their association. WUAs must raise and address institutional and organizational limits before they expand to include financial and commercial activities.

2.2 MOROCCO WASTEWATER REUSE FOR AGRICULTURE

Introduction

Meknès wastewater treatment plant

Currently, almost no urban areas in Morocco have wastewater treatment facilities for agriculture reuse. A notable exception is the wastewater treatment plant (WWTP) located at few kilometers north of the city of Meknès. The entire project, consisting of a piped sewage network, run-off collectors, and treatment plant, was completed in late 2008 after nearly a decade of design and construction at a cost of $70 million. The plant has nine football-stadium sized lagoons for primary treatment that extends over 35 hectares of land. The treated wastewater is discharged directly into the Oued Boufekrane River. Until the plant opened, raw wastewater was being dumped into the river, which resulted in health problems, primarily because farmers along the river used it for irrigation and washing.

Although limited to the region surrounding the city of Meknès, this study had striking regional significance and implications. In the Middle East, countries face worsening water scarcity and increasing competition for water resources. In addition, questions arise as to the effects of climate change and the growing food crisis. Reusing treated wastewater is an increasingly attractive option for countries that seek to maintain or expand their current water allocations for agriculture but also need to shift water supplies for household and industrial uses. Wastewater reuse expands the size of the pie. However, it introduces many challenges and unknowns for local governments and communities.

USAID/Morocco requested ABRI's technical services to assist the Government of Morocco in identifying and assessing options for wastewater reuse for agriculture in the region of Meknès. In close partnership with Meknès' water agencies, ABRI established the design of an innovative pilot project to evaluate options for reusing wastewater in agriculture. The Wali (Governor)

established a Coordination Committee, which included the principal agencies in the water sector, to participate in this project.

Approach

ABRI selected the team based on their areas of expertise and location in the Middle East region in accordance with the project's regional approach. The team was composed of nationals from Lebanon, Jordan, Morocco and the U.S.A:

- Said Ouaattar, Integrated Water Management Expert and Team Leader, Morocco
- Mustapha Naimi, Soil and GIS Expert, Morocco
- Ahmad Abu Awwad, Wastewater Management Expert, Jordan
- Jean Karam, Institution Expert, Lebanon
- Mohamed Bourrass, Agricultural Engineering Expert, Morocco
- Peter Reiss, ABRI COP, USA

The ABRI team implemented this pilot project in close partnership with the Wastewater Treatment and Reuse Coordination Committee established by the Wali of Meknès in May 2008. The member agencies included: The National Drinking Water Authority (ONEP), which led the Committee, the Autonomous Electricity and Water Distribution Authority (RADEM), the Agricultural Production Directorate (DPA), and the Sebou River Basin Agency (ABH-Sebou). In addition, the committee included the Wali's office representative, a representative of the regional council/municipality, representatives of the Regional Department of Commerce and Industry (MCI), regional representative of the "Confédération Generale des Entreprises" du Marco (CGEM), the Regional Health Authority and the Department of the Environment. These agencies' representatives participated in the committee's meetings upon invitation by the Chairman. The coordinating committee was instrumental during all project stages.

The project was planned for one year but took 18 months to be completed because of the participatory approach which necessitated negotiations and confidence building among institutional partners to achieve the activity's goals.

Achievements and Results

ABRI prepared five reports in English and French and organized a workshop to discuss findings, lessons learned, and make recommendations. The deliverables were as follow:

- Report 1: Pilot Project Wastewater Reuse in Agriculture, Meknès, Morocco. Diagnosis and current situation analysis, Jan/April 2009.

- Report 2: Pilot Project Wastewater Reuse in Agriculture, Meknès, Morocco. Soil, Land Use and Irrigation Network Mapping, Jan/April 2009.

- Report 3: Pilot Project Wastewater Reuse in Agriculture, Meknès, Morocco. Irrigation system design and institutional Framework, Jan/April 2009.

- Report 4: Pilot Project Wastewater Reuse in Agriculture, Meknès, Morocco. Guidelines for Treated Wastewater Reuse in Agriculture, Jan/April 2009.

- Final Workshop (See below)

In addition to the above deliverables, ABRI prepared three additional deliverables:

- ABRI wastewater article prepared and published in the Arabic Environment Magazine "Mountada Albia", Egypt Published by RAED. Pilot Project Wastewater Reuse in Agriculture, Meknès, Morocco: A case study. July 2009.

- ABRI wastewater pilot project leaflet. Prepared, presented in public, and distributed during the International Agriculture Fair held in Meknès, April 2009.

- ABRI successes reported in the newspaper "Le Matin", the most widely distributed daily newspaper in Morocco, Le Matin, 06-07-2009.

Workshop Participants

Following the completion of the USAID/ABRI wastewater Reuse Pilot Project field activities, the team held a workshop on June 9, 2009 to discuss the findings and to make final recommendations. This was an important regional and national event where it became clear that many regarded the pilot as a lead that could be replicated in other regions.

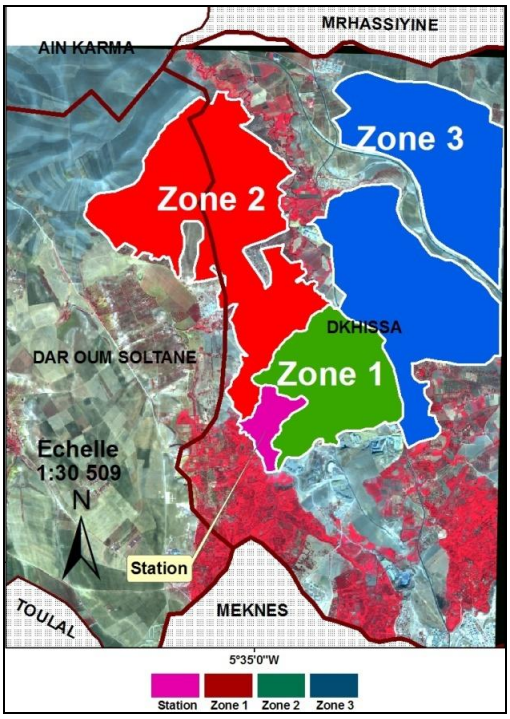
The workshop was chaired by the Wali (Governor), who attended the entire event, and included the following institutions:

- The Wali and Wali's office representatives
- The Head and representatives of the Municipalities' Department
- The head and representatives of ONEP
- The head and a representative RADEM
- The head and a representative of DPA
- The head and representatives of ABH-Sebou
- The representatives of MCI
- The representatives of CRI (Regional Investment Center)
- The head and a representative of the Regional Health Authority
- A representative of the Regional Education Department
- USAID mission representatives
- The USAID /Chemonics Agribusiness project COP
- The USAID/ABRI team

Potential Irrigation Perimeters for Wastewater Reuse

During the workshop, participants discussed and validated the zoning approach and results, the methodology for which was based on two key criteria: geographic proximity to wastewater treatment and appropriate altitude to reduce water pumping and distribution costs. The team identified the following three potential zones and determined their physical, soil, and topographic characteristics.

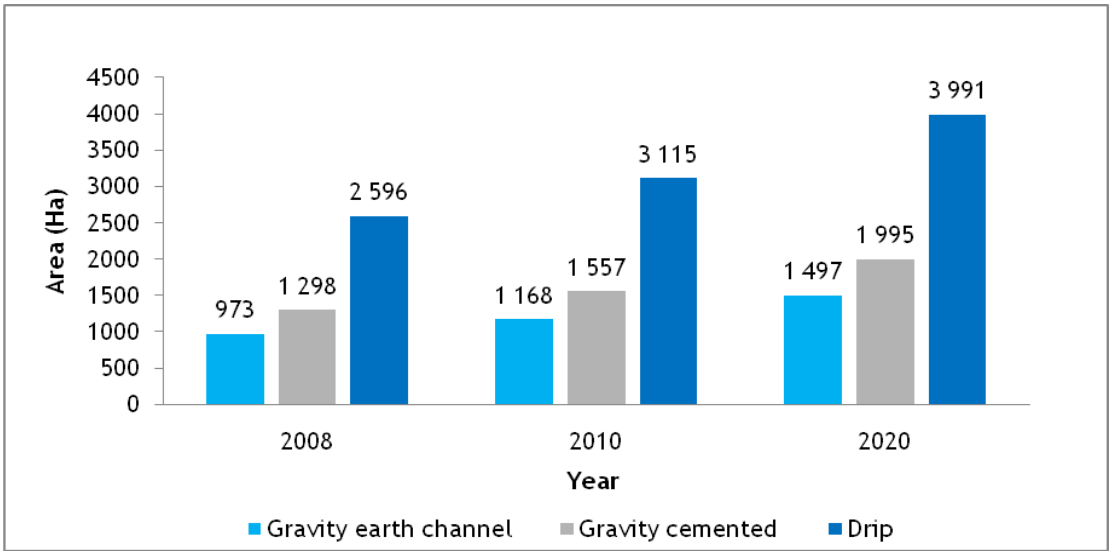
Potential Irrigation Perimeters for Wastewater Reuse



Potential Irrigable Land According to Irrigation Systems

The team also quantified the potential irrigable land, taking into consideration future increases in wastewater produced by the city of Meknès between 2008 and 2020 and the irrigation system. We determined that the potential irrigable land using drip in 2008 was 2500 ha and would increase to 4000 ha by 2020. These results were of great interest to participants because the acreages were two times higher than expected.

Potential Irrigable Land According to Irrigation Systems



Farmers' Concerns and Willingness to Participate

The ABRI team presented and discussed the results of the diagnosis and situation analysis during the Workshop, where they noted that:

- Water is the basic factor limiting the production and intensification of crops due to the existence of a structural water deficiency that exceeds 900 mm and occurs seven out of twelve months per year;

Cultivated land in Meknès, Morocco

- Producers recognize this limiting factor and confirm the vital role of the availability of regular irrigation water. They value water for its ability to increase their crop yields by two to three times, depending on the type of crop;

- Farmers stated that they are willing and highly motivated to participate in the pilot project to reuse wastewater;

- Farmers' willingness to buy water is collectively favorable and can be channeled to develop urban agriculture using wastewater. They view wastewater as an important resource;

- Farmers stressed their desire to subscribe for treated wastewater in exchange for paying a fee. The accepted prices are on average 0.5DH/m3. This is one of the highest prices paid by farmers even in Moroccan irrigated perimeters.

In conclusion farmers' perception showed that there was a captive market for water that can be developed. The price they were willing to accept was encouraging and showed a great willingness to participate to the Pilot Project implementation. The team recommended moving to the next step by creating a Farmers' Water User Association or an Agro-Business Association, which would represent the farmers as a full member of the Coordinating Committee for project implementation.

Regulations and Management Guidelines

The conference attendees presented and discussed regulations and guidelines and proposed best practices to reduce health risks. The main highlights are as follows:

- The group acknowledged that in Morocco, in spite of the fact that the Moroccan application Decree (No 2-97-875, 1998) related to the use of wastewater stipulates that no wastewater can be used if it has not been recognized as treated wastewater, most of the wastewater produced by inland towns is reused, mainly, as raw wastewater. They also recognized that the widespread reuse of untreated sewage for agricultural production causes very important health risks and needs to be regulated using field based “standard guidelines”.

- The updated legislative framework includes two types: Regulations and Guidelines. Whereas regulations are legally adopted, enforceable and mandatory, guidelines are advisory, voluntary and non-enforceable, though they can be incorporated into water reuse management through permits, which would make them enforceable requirements. The team recommended using guidelines to provide flexibility in regulatory requirements that could vary depending on site-specific conditions which can result in differing requirements for similar uses.

- The USAID/ABRI work provided regulations and guidelines for safe, on-farm use of reclaimed water. These regulations and guidelines are intended to be used by irrigators who already use reclaimed water to help them avoid health risks to themselves, their families, and the general public who may use their products. They offer detailed information and best practices for Meknès WWTP effluent reuse in five different areas: crop selection, irrigation activities, agricultural activities, harvesting, and post-harvest.

- The fundamental aspect for successfully using treated wastewater is personal hygiene. If irrigators take appropriate precautions when using treated wastewater then health and environmental risks are kept to a minimum. If, on the other hand, irrigators handle treated wastewater casually, then they expose themselves, their families and consumers to the risk of infection. Therefore, the team regarded and recommended training farmers on best practices for using treated wastewater as a priority.

- Olive trees, cereals, legumes, and fodder crops are best suited for irrigation with treated wastewater outflow from the Meknès wastewater treatment plant. While it is legal to grow vegetables that will be cooked after harvesting, experts recommended this is only when the quality of effluent is very high and where farmers are already proficient in controlled irrigation. Farmers should select crop patterns that maximize water use in both summer and winter seasons. This will require a combination of perennial and seasonal crops.

- The team proposed an irrigation network design for the Pilot Project that followed all standards, including the use of sand filters and screen or disk filters. If irrigators follow proper guidelines, then there is minimal risk of breaks and leaks that may contaminate produce and the environment. Irrigators must install drippers and emitters properly to avoid wetting of leaves and fruits.

- The team specified that certain agricultural activities require special attention: soil testing to identify fertilization practices and avoid over-application of nitrogen, proper pruning, and preventing animals from entering areas irrigated with treated wastewater.

- Harvesting techniques should focus on the need to minimize contact with the crop and ensure that edible parts do not come into direct contact with water or soil. Farmers should stop irrigation two weeks before harvesting winter fodder and fruit trees. Fodder crops are best suited for mechanical harvesting, while all fruit is picked by hand.

- Farmers should label, separately store, and avoid bringing into living quarters produce grown using treated wastewater.

- During implementation, the team acknowledged that a specific program is needed to build agriculture extension services capabilities to train and advise farmers on these new best practices for reusing wastewater.

Lessons Learned

Lessons learned emphasize the importance of the following issues:

- The work of the coordinating committee showed that establishing a sound institutional setup and clearly defining the role and responsibility of every institution involved was key to advancing wastewater reuse. In addition, it is important to assist institutions responsible for strict quality control and health protection measures.

- Involving farmers and the local community in the decision-making process and in the management of perimeters irrigated with treated wastewater was regarded as the next project step. A Water user association will be created in the target pilot zone.

2.3 YEMEN BASIN MANAGEMENT ASSESSMENT

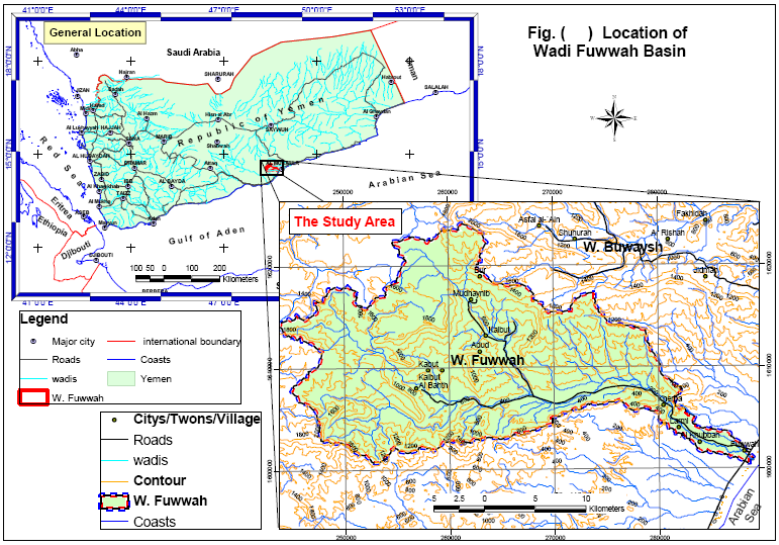
A defunct well stands idle in Yemen despite a growing need for water.

Introduction

The central Middle Eastern region, which includes Bahrain, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates, and Yemen, is an arid, water scarce region with some of the most varied economic conditions in the world. The countries in this area are also faced with some of the lowest water availability per capita in the world, though access to clean water and sanitation are generally high, with the exception of Jordan, Oman and Yemen. Agriculture employs large segments of the population and consumes the largest amount of water of any sector (over 50% in all countries and over 90% in some), which is compounded by extremely low water use efficiency in the sector.

Additionally, water availability in the region is decreasing and is predicted to continue falling through this century, placing increased stress on the area's aquifers and hydrological systems (World Bank, 2007a). If these countries continue considering only renewable water resources, most countries in the region will, in the near future, not be able to meet their domestic water requirements and as a result will have to implement aggressive water conservation measures and turn to other sources (e.g., nonrenewable sources, water reuse, desalination, and virtual water).

Location of Wadi Fuwwah Basin



Yemen is one of the oldest civilizations in the world (originating about the 9th century BC). It is located in an arid region with no permanent rivers, though the country has extensively developed groundwater resources. In contrast to the rest of the countries of the central Middle Eastern region, 30% of Yemen's population lack access to clean water and 70% live without access to sanitation services (World Bank 2007a). Currently, demand for surface water in Yemen exceeds its availability, with deficits often reduced by pumping nonrenewable storage from deep aquifers. This, in turn, has resulted in major groundwater depletion in a number of regions of the country, which in some cases is alarming: the decline in water level in some wells has been found to be 2 – 6 meters per year (e.g., in the Sana'a basin).

Goals and Justifications

The severity of the water crisis has urged the Yemeni government to invest in water resource management to slow the pace of depletion of this precious resource. There are many factors (technological, social, institutional and economic) that have contributed to the present water crisis. Due to low precipitation throughout Yemen, the government's plan to manage groundwater depletion is seen as the most important element of the new vision.

With the above justifications in mind, the ABRI team made a series of visits to Yemen to identify the goals of the initiative. The team held multiple meetings with government officials of the Yemeni National Water Resources Authority (NWRA) to discuss possible water management activities for technical assistance. Following the meetings, the team identified the following goals for the activity:

- Provide baseline data and completed analysis for a basin or a sub-basin, depending on the available budget; and

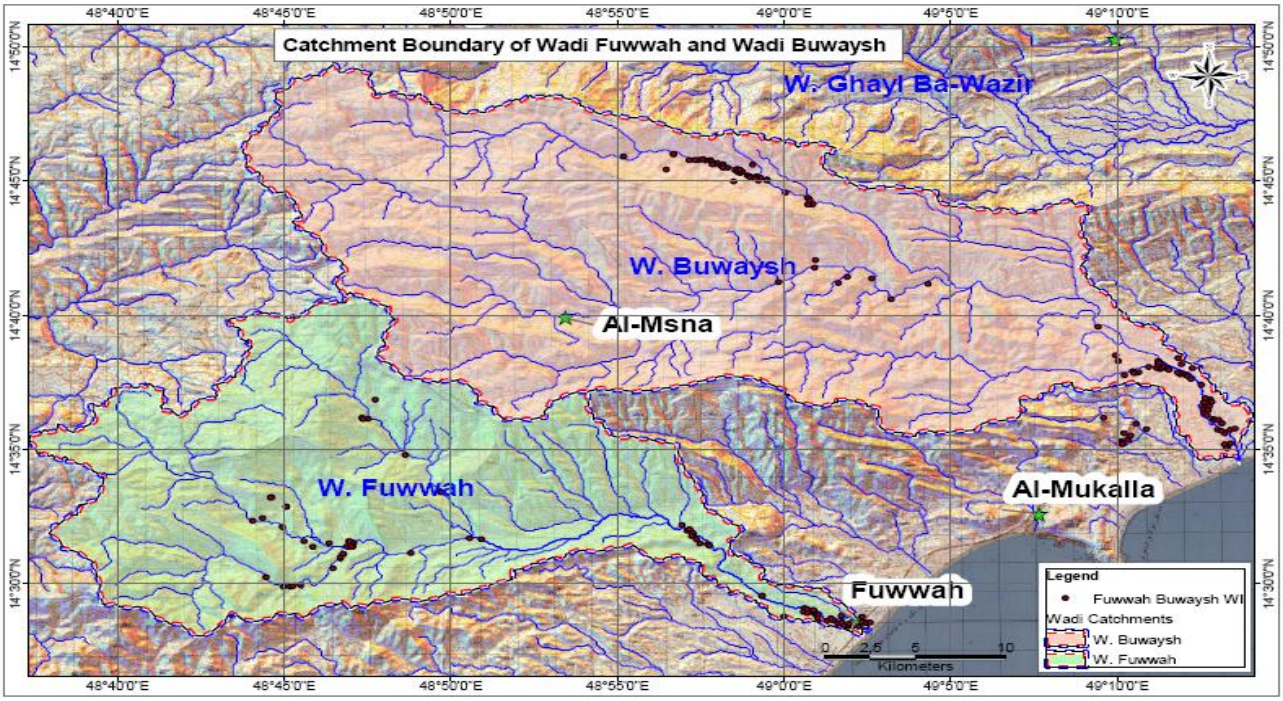
- The targeted basins or sub-basins to be studied by the ABRI team will not be covered by other donors.

Tasks and Objectives

With a primary focus on groundwater management, the discussions between ABRI and the Yemeni government revealed that ground and surface water assessments of Wadi Hadhramawt Basin, with particular attention on specific sub basins such as Wadi Buwaish/Thulla and Wadi Fuwa/Kurba, to be the highest priority. Both are located in the Hadhramawt Governorate in the south of Yemen near the Arabian Sea.

Following ABRI's review of NWRA's studies on the two sub basins, it became clear that there were substantial information gaps that needed to be bridged in order to prepare the regional water resources management plan. The main information gaps were not related to the quantity of information, but to the quality and distribution of information in space and time. With regard to the two sub basins, these gaps were mainly a result of complete or partial absence of hydrological and hydrogeological data and information.

Catchment Boundary of Wadi Huwwah and Wadi Buwaysh



Based on the gaps ABRI identified, the team developed four tasks to collect the required information to support the preparation of a water resources management plan in Hadhramawt basin, the two chosen sub-basins in particular. The following list shows the agreed upon tasks with their objectives:

- Review and consolidation of information in a database:
  - Gather all relevant information on water resources in the area;
  - Facilitate proper storage and manipulation of hydrometric, geological, and hydrogeological data and water use data;
  - Indicate data gaps; and
  - Screen and document the data.

- Well and spring inventory:
  - Obtain information on groundwater occurrence, quality, and use;
  - Obtain information on the location of springs, together with quantity and quality of water available from them; and
  - Assess spatial variation in groundwater availability.

- Select and establish a new well monitoring network:
  - Review the existing network, historical data, and the operations the existing network according to meteorological parameters, surface water and groundwater; and
  - Design a new monitoring network.

- Groundwater modeling:
  - Improve estimates of recharge, discharge and abstractions; and
  - Forecast changes in water availability, followed by a simulation of current (for verification) and potential aquifer use scenarios, based on the results of hydro-geological investigation and assessment, refined aquifer characteristic values, and abstraction estimates with a view to predict the behavior of the aquifers when subjected to various stresses (i.e. pumping).

Yemeni men discuss a village's well during data collection.

5. TASK 2: W.

Approach

The following were key components of the implementation approach:

- Reached an agreement with the NWRA on ABRI's commitments and each party's contribution, as the activity was not able to cover high cost items;
- Prepared a scope of work that identified and outlined areas for ABRI support to Yemen;
- Established a Yemen-based technical team to undertake all ABRI commitments in full coordination with NWRA and under its supervision. The activity required close and ongoing contact with the farmers and well owners if the activity was to gain their trust and confidence;
- Hired underutilized and talented Yemeni experts to make an importance contribution to the activity; and
- Ensured that the farmers' voices was heard and incorporated into the study.

Partnership

There are various government water management agencies involved in groundwater issues in Yemen, especially in rural areas. These agencies include: the Ministry of Irrigation and Agriculture (MIA), Ministry of Water and Environment (MWE), National Water Resources Authority (NWRA), Ministry of Local Administration (MLA), Ministry of Work and Social Affairs (MWSA), governors and governorates, district government, and local councils. To establish partnerships with these ministries, government entities and other stakeholders, the ABRI team made a series of visits to key ministries and entities, after which it became clear that NWRA represented the primary body that conducts water studies and planning. Additionally, the stakeholders agreed to have NWRA represent them and serve as the main coordinating partner with ABRI. At a later stage, ARBI developed this activity through a series of discussions with government officials from NWRA.

Timeframe

The time frame of the activity was nineteen months, starting from October 6, 2008 to April 30, 2010.

Achievements and Results

Task 1: Review and Consolidation of Information and Database

Task 1 included two main assignments: the first was to review and consolidate all available information and the second was to gather and store this information in a newly created database.

During the period from December 2008 through January 2009, two members of ABRI's technical team worked very closely with technical staff from NWRA to collect all their available monitoring information related to wells and springs in Wadi Buwaysh and Wadi Fuwwah in Hadhramout Government. The work was undertaken in the governorates of Sana'a and Hadhramout. The team also visited all relevant water related facilities in Hadhramout to make sure that all

available data was collected. In February 2009, the team started to review and screen the collected data and facilitate proper storage in the newly created database.

At the same time that the team was collecting the data, one member was engaged in creating the targeted database. The purpose of the new data base was to gather all relevant information on water resources in Wadi Buwaysh and Wadi Fuwwah in Hadhramout Government and to facilitate proper storage and manipulation of meteorological, ground water, and surface water data. The system analyst worked very closely with NWRA's experts for two months to develop a database compatible with NWRA'S Main Database, which is called National Water Resources Information System (NWRIS). They created the database in MS Access 2003 and included a component to store and coordinate all monitoring parameters for Wadi Buwaysh and Wadi Fuwwah. New monitoring parameters can easily be added without changing the structure of the database. At a later stage, water related data originating from other Authorities will be added as well as data resulting from specific field studies, such as rainfall, climate, and groundwater data, among others.

In June 2009, ABRI delivered copies of the database to NWRA.

Task 2: Well and Spring Inventory

From 1978 to 1980**,** a French consulting engineer**,** SOGEREAH, undertook a series of water resources studies for the areas of Fuwah, Mukalla and Khird. The aim was to estimate the water resources available in these areas and identify locations for new wells to satisfy the growing demand for water of adjacent towns and villages. Three decades later, NWRA has requested an update to this aging data.

As part of the study, the ABRI conducted a comprehensive well inventory that examined groundwater occurrence, quality, and utilization, as well as a spring inventory to obtain information about the location of the springs and the quality and quantity of water available from them. The scope of the inventory included the following:

- A review of previous well inventories;
- A well inventory in accordance with NWRA's format and guidelines;
- Ground water level measurements from the surveyed wells, whenever possible, as well as measurements of the conductivity, pH, and temperature;
- Data entry into the NWRA database system;
- Analysis of collected data;
- Visualization/interpretation of the inventory results using maps and graphs; and
- A description and

One of the wells included in the well and spring inventory conducted by ABRI.

evaluation of the results.

To collect the well and spring data, the ABRI team used a questionnaire provided by NWRA that incorporated comprehensive information on wells and springs. The ABRI team then collected information on 29 technical parameters for each water point, under the supervision of each water sources' representatives. In total, the team carried out three field visits to the two wadis where they used the necessary technical equipment to gather data, including a water quality measuring kit to measure the EC, pH, and temperature of the water, a global positioning system (GPS) for geographical positioning, and other equipment to measure well depth, well discharge, and water levels. The team then conducted a third visit to study the consequences of 2008's big flood, which buried many wells, causing instability of the water level of other wells and threatening the consistency of the well inventory data already collected. Hence, the team deemed the third visit necessary to see if some of the buried well were once again operating and to enhance the collected data with additional measurements.

At the close of the survey, the ABRI team wrote two technical reports discussing the main findings for the two wadis (Fuwwah/Khirba and Buwaish/Thulla) that were then delivered to the NWRA representative, along with a soft copy of the database file. The database contained all data gathered from the well inventory survey using the Microsoft Access Database program approved by NWRA and was then tabulated and analyzed. The reports used technical graphs and topographical maps to present the results as well as the information gaps that must be bridged in order to prepare the regional water resources management plan.

In general, the reports provided the following information:

- Data on area characteristics: location, climate, rainfall, potential evapo-transpiration, temperature, relative humidity, sunshine and radiation, geological and hydro-geological characteristics.

- Well & spring inventory data: total number of wells and spatial distribution, well type, well depth, depth of groundwater, lithological description, electrical conductivity, pH of surface and ground water, temperature of groundwater, well yield and groundwater abstraction, agricultural practices and cropping patterns, irrigation practices, domestic water use, industrial water use, and information about the chemical analysis of the water such as quality and its suitability for irrigation.

Taking water measurements for the assessment

Task 3: Review and Design of a Monitoring Network

Collecting hydrological, hydro-meteorological, and hydro-geological data is the basis of any water assessment program. Without timely and correct information, it becomes difficult to assess any available water resources in terms

of quantity and quality. Additionally, field data must be processed and interpreted in a way that suits the assessment's requirements for quantity and quality of these resources. Properly interpreted data is necessary to help establish a general water balance for the investigated area and subsequently to contribute to recharge estimates that are required to assess groundwater resources. Collecting data allows researchers to observe trends in groundwater level changes from both natural (e.g. rainfall) and artificial (abstraction) events. Therefore Task 3 was divided into two parts: the well monitoring network and the hydrological, climatological and surface water monitoring network. ABRI defined the shared objectives of the two networks:

- To evaluate the existing network, review all historical data, and possibly re-operate parts of the network to measure meteorological parameters, surface water, and groundwater; and

- To design a new monitoring network.

Evaluation of the Well Monitoring Network

At the time the activity began, there was no existing well monitoring network in Buwaish and Fuwwah Wadis. The ABRI technical team visit to the Hadhramout NWRA branch revealed that it possessed no wells for monitoring purposes and instead found only that the Local Water Supply and Sanitation Corporation (LWSSC) had undertaken some water level measurements at Al-Mukalla. The team also discovered that 61 wells and boreholes had already been dug in the area. Out of these, only 51 wells and boreholes satisfied the selection criteria for monitoring. Taking into consideration the total area of the wadis and the current distribution of the existing wells, the team concluded that the 10 monitoring wells already used by NWRA were sufficient. Thus, the monitoring well density was one for every 110 km^2.

The ABRI technical team also surveyed the monitoring/measuring devices used by local water officials. LCWSS used a flow meter device to measure groundwater abstraction rates and manual readings for groundwater level measurements. Within the last three years, the Ground Water and Soil Conservation Project (GSCP) installed groundwater monitoring equipment in many wells in Yemen using the automatic water level and water quality recorders under the supervision of NWRA. This equipment was placed on abandoned wells, which were not "monitoring wells", but instead are considered "wells that are monitored". The difference is that monitoring the water level in these wells is not representative for the monitoring objectives of detecting water level changes due to changes in water savings under GSCP. ABRI reported all these findings to NWRA.

As for analyzing available data, the team made it clear that no data is available from observatory wells to carry out a trend analysis. LCWSS collected data for a period of time, but only from pumping wells, due to the absence of observatory wells in the project area. Thus, the data available from LCWSS is exclusively from dynamic water levels that cannot be used for trend analysis. Moreover in order to conduct a trend analysis, the team needed data for at least two to three years from observatory wells. As a result of these findings, ABRI would recommend that the NWRA Hadhramout branch undertake a long-term monitoring program to evaluate the groundwater situation in the two wadis.

Evaluation of the Hydrological, Climatological and Surface Water Monitoring Network

For any water resources management study, all hydro-meteorological data related to the water cycle can either be collected through monitoring or derived from calculations/estimates. In

addition to hydro-geological and groundwater data, surface water and hydro-climatological data are also requisite for such study. The ABRI team's investigation revealed that there was no rainfall station in either Wadis, only a single weather station was located in the surroundings at Al-Rayan airport. The nearest stations were the three located at Wadi Hajr, one of which was out of order (the weather station located at Sidarah) and the two others were standard rainfall gauges located at Mayfa'a Hajr and Al-Heylah. Data collection from the Al-Rayan Station was not conducted from 1942 to 2000 and none of the rain gauge stations or the weather station have registered sufficiently long-term data. In general, the following features emerged with respect to the existing network:

- The study area seriously lacks historic rainfall data; and
- Only one meteorological station maintained by the Civil Aviation and Meteorological Authority (CAMA) has sufficiently long-term data.

The ABRI team visit also revealed that although the project area has experienced several significant floods in the past, no flood measurements were taken due to the lack of a stream flow gauging station. The team was also unable to track any records from the two wadis gauging stations that were installed in 1982.

Design of Operational Network

Following its assessment, the team found that using the existing network would be challenging. The team was not able to assess the adequacy of the available rain gauges through statistical analysis because the five rain gauges in the two wadis did not have continuous data. From the analysis of the stations in both wadis (650 km^2 Wadi Buwaish and 450 km^2 Wadi Fuwwah), the team found the optimum number of stations to be seven. This finding was based on World Meteorological Organization (WMO) standards that state that one rain gauge is needed per 100-250 km^2 in mountainous regions of temperate, Mediterranean, and tropical zones.

Accompanied by NWRA experts, the ABRI technical team visited the study area to identify sites to install new instruments. During the site visit, the team discussed various issues with local villagers, in particular the availability of space for installation. As a result, the team generated a table that included the proposed locations and followed a similar procedure to select the sites for the Wadi gauge stations for flood measurements. During the site selection, the team considered features such as channel characteristics, the possibility of back water, and accessibility to the site, among others. At the close of Task 3, ABRI suggested two new locations and wrote a final report that catalogued the required monitoring instruments.

Task 4: Groundwater Modeling

Modeling is an attempt to replicate the behaviors of natural groundwater or a hydrologic system by defining the essential features of the system in some controlled physical or mathematical manner. Modeling plays an extremely important role in the management of hydrologic and groundwater system. As a part of the proposed future regional water resources management plan, NWRA determined that it was essential to carry out a groundwater modeling exercise for two the Wadis. The ABRI team approved the idea and the job was undertaken under Task 4. The general objectives of this task were:

- Assess general flow direction of groundwater in the aquifer;

- Examine the possibility of interference of the groundwater aquifer layer in both horizontal and vertical directions;
- Assess groundwater storage in the aquifer;
- Examine the implications of various groundwater management strategies;
- Estimate the variation of groundwater levels under present abstraction rates and future abstraction and its spatial distribution for long term sustainability of groundwater storage;
- Impact assessment under various abstraction scenarios;
- Maps and cross section showing the distribution of the water table, fresh water, and brackish groundwater in space and time; and
- Detailed documentation of modeling procedures, assumptions, and results.

The reliability of any groundwater model depends on properly simulating the groundwater situation in the basin. This then depends on proper calibration, for which it is indispensible to have data on the geometry and hydraulic characteristics of the aquifer and data on water levels and water balance, in addition to other information as needed. The groundwater modeling report included the following:

- A description of the conceptual model
- The choice of finite difference method and application of Visual Modflow
- The boundary conditions
- The geometry, the hydraulic characteristics of the aquifer and water table and water balance data applied as inputs to the model
- The detailed model inputs and results

NWRA can use the program for different scenarios and work out strategies for groundwater development. At present the model has been developed for a single aquifer and multiple aquifer system for 365 days. It can be altered for different time periods both short and long term and under various contingencies.

Lessons Learned

- Demand for water in Yemen is exceeding its availability. More USAID investment is required in the Yemeni water sector.

- Underutilized and talented Yemeni experts are available and can be engaged to make an important contribution to their country's water sector.

- Partnering with NWRA as a representative for multiple ministries and other Yemeni entities was a successful approach.

6 TASK 3: IMPROVE ACCESS TO WATER SUPPLY AND SANITATION SERVICES

3.1 ACWUA INSTITUTIONAL SUPPORT

Introduction

ABRI sought to strengthen regional platforms and networks that include the private sector, donors, non-governmental organizations, and academic and public authorities to address critical issues of water resource management and water supply and sanitation issues.

The Arab Countries Water Utilities Association (ACWUA) was established to address chronic regional problems, such as water scarcity, weak water and environmental policies, high investment needs, lack of management and technical capacity, increasing demand due to growing populations, and conflict. Its role and mandate as a regional platform tackling the performance and support of water utilities in the region was consistent with ABRI's objectives and therefore was engaged as an active project partner.

ABRI set out to support ACWUA's presence in the region and enhance the 'value proposition' it offered to members. As a USAID-funded funded program, ABRI committed to support ACWUA's vision of being a self-sustaining, strong regional association of Arab water utilities with a specific objective of improving the efficiency of operations and effectiveness of service provision by utilities in the region. ABRI's support aimed at strengthening ACWUA by clarifying its mandate and role, strengthening its core technical operations, encouraging its intellectual leadership in the water sector, and in supporting its long-term management, technical, and financial viability as a regional association. Specifically, ABRI:

- Assisted ACWUA in further developing and strengthening its institutional structure to enhance its ability to effectively operate consistently with its vision, having been able to establish a charter and membership structure, organize technical events, and establish its headquarters in Jordan.

- Assisted ACWUA in creating a "value proposition" for its members by facilitating knowledge exchange and networking opportunities. This was manifested by the support provided by ABRI during ACWUA's conference on cost recovery in January 2010.

- Assisted ACWUA in affirming its intellectual leadership and establishing a "brand" in water and sanitation in the Middle East through its support for ACWUA's active participation in regional and international venues, and enabling it to reach out to the academic community and private sector and participate in business-convened meetings.

Approach

Since ACWUA's inception in 2007, GTZ committed to providing it with financial and strategic support and even placed a utility expert in ACWUA's headquarters to support the secretariat. Soon after, IWA and ACWUA signed a Memorandum of Understanding (MOU) that established the general terms and conditions under which both organizations would collaborate to achieve mutually agreed upon objectives defined within a work plan. Under the MOU, IWA agreed to provide in-kind resources to support leadership mentoring, organize meetings and conferences, draw on its technical working groups (TWGs), and facilitate publications and knowledge sharing with ACWUA.

As key partners with ACWUA, ABRI worked closely with GTZ and IWA to support ACWUA's vision of becoming a self-sustaining, strong regional association of Arab water utilities with a specific objective of improving the efficiency of operations and effectiveness of service provision of utilities in the region. Planning for this activity started in December 2008 when ABRI and ACWUA jointly designed several tasks and implementation began in early 2009 through the originally planned conclusion of the ABRI program in April 2010.

ABRI initially focused on defining ACWUA's role and mandate and then on building ACWUA's capacity, strengthening its core operations, and supporting its long-term viability. ABRI provided support to ACWUA utilizing different techniques, through which ACWUA was to integrate many of these activities into its normal operations beyond the contract life of ABRI. Additionally, ABRI's approach took into account pre-existing and new partnerships to most effectively support ACWUA and the role of each partner. Specifically, ABRI:

- **Provided technical experts to design and implement activities:** ABRI provided the technical capabilities that ACWUA, as a nascent association, did not have to design, develop, and implement activities that were consistent with the functions and responsibilities entailed in its first year of operations. An example of this approach was providing ACWUA with the required skills needed to develop a capacity development strategy for the staff in the association.

- **Covered the costs of convening workshops, conferences, and meetings for ACWUA management and members:** ABRI covered the costs of ACWUA's participation in several high profile events regionally and internationally. This supported building its brand as a leading regional association in its field.

- **Brokering water operator partnerships (WOPs) and twinnings within and across the region:** ABRI assisted in bringing together UN-HABITAT and ACWUA for the purpose of exploring the possibility of implementing water twinnings between utilities in the region.

- **Supporting nascent TWGs:** ABRI provided technical and financial resources to support the successful implementation of the working model for ACWUA's technical working groups. These TWGs are at the core of ACWUA's technical operations and serve to share knowledge and explore jointly improved practices for adoption by the wider community. ACWUA considers them to be one of the main drivers of ACWUA's financial viability and intellectual leadership.

Achievements and Results

ABRI's support to ACWUA entailed a variety of tasks that fell within the different implementation areas described above. These tasks are listed below along with key results achieved:

- ABRI provided specialized technical assistance to:
    - Develop a scope of work for ACWUA's Technical Services Director to help them in the recruitment process. Consequently, the position was filled in early 2010.
    - Develop proposals to donor agencies to gain financial support for key activities. Following the formal launch of ACWUA, it sought support from and was approached by several donor agencies offering funding support targeted to specific activities, such as the TWGs. The ABRI Technical Support Team then prepared two technical and financial proposals to SIDA on the Association's behalf centered on supporting two of its TWGs. SIDA accepted the proposals and ACWUA secured funding for the two working groups.
    - Prepare and submit another proposal to UN-HABITAT for the implementation of Water Operators Partnerships in the region in association with ACWUA. This potential partnership was fostered by ABRI and brought the two parties together to explore possible areas of cooperation.
    - Develop an initial working model for the TWGs. Through the technical support provided to ACWUA in developing the proposals above, ABRI designed an initial high-level working model for the TWGs in a standardized approach that can be implemented for all the TWGs, while leaving enough flexibility to tailor individual action plans to the specialization of each TWG.
    - Develop presentations on behalf of ACWUA for delivery by the Secretary General of the Association in the following events:
        - Association launch ceremony in July 2009 in Amman, Jordan where the Secretary General of the Association presented about ACWUA, its vision and mission statement, strategic objectives, member utilities, partners, achievements, and plans for the future.
        - RAED climate change workshop in Cairo, Egypt in October 2009 where the Secretary General presented on climate change.
        - The event held in Abu Dhabi in January 2010 where the Secretary General presented on ACWUA's experience with the role of water utilities in Arab countries with water saving, water conservation, and protection in urban water management.
- ABRI and ACWUA collaborated in the development of a five-year business plan for the Association that was presented to and approved by its Board of Directors (BoD). The Business Plan covers the period of 2010 through 2014 and will serve as the strategic guide for the development and growth of the Arab Countries Water Utilities Association. ABRI and a working group composed of ACWUA senior management and three Boards members spearheaded the Business Planning process, receiving advice from the International Water Association on an ad hoc basis. It was also coordinated with assistance from the German Technical Assistance Agency (GTZ) and its resident project manager.

The resulting Business Plan can be considered both a document and a tool. As a document, the Business Plan provides a clear, concise means for ACWUA to communicate its vision and mission to its various audiences and stakeholders, as well as its specific Strategic Goals for the planning period and how it intends to achieve those goals. It also presents the revenue expectations and expense forecast that senior management believes will be necessary to achieve its Strategic Goals.

As a tool, the Business Plan development defines a process that ACWUA can repeat in the future as it conducts annual updates of the Business Plan, by assessing how it performed against its defined interim milestones, and what changes need to be made to the Business Plan for the subsequent five-year period. To aid this process, the Business Plan contains a computer-based spreadsheet model that accommodates data input, cost, and revenue assumptions that will allow ACWUA to consider new or different assumptions and to forecast their impact on the "business" of the Association.

- The ACWUA launching ceremony was held on July 30, 2009. The ceremony was held in Amman, Jordan and attended by members of ACWUA's Board of Directors, members from the private sector, representatives of funding agencies such as GTZ, USAID, and the Agence Française de Développement (AFD), and Jordanian and Arab officials, including the Jordanian Minister of Water and Irrigation. ABRI supported the launch ceremony in a numbers of ways:

  - ABRI financed the cost of participation for the attending members of ACWUA's Board of Directors.

  - The ABRI business planning expert, Philip Giantris, presented the latest outline of the expanded Business Plan to the Board of Directors and attended the BoD meeting that took place the next day, acquiring the necessary input to finalize ACWUA's expanded 5-year business plan.

  - ABRI prepared the launch event presentation given by the Secretary General to the ceremony attendees.

- To help expand ACWUA's presence and notoriety at the regional and international level, ABRI provided financial support for ACWUA's participation in several events. This support was spread among several activities:

  - In July 2009, IWA organized and facilitated a meeting in The Hague on Business Planning to help ACWUA develop its business plan and communications strategy. The meeting brought international experts from similar associations and Communications and Knowledge Management experts to work with ACWUA's Secretary General, the GTZ Advisor, the ABRI Chief of Party, and the ABRI Business Planning Lead Expert. ABRI covered the travel and logistics costs for the participation of ACWUA's Secretary General.

  - For the purpose of strengthening ACWUA's brand and its leading role at the regional and international level, ABRI supported the Secretary General's participation in the following conferences or workshops by covering travel and logistical costs and providing technical assistance in preparing his presentations for the events: World Water Week in Stockholm, Sweden in August 2009 and the RAED Climate Change workshop held in October 2009 in Cairo, Egypt.

- ABRI helped develop the sponsorship page for the Non-Revenue-Water specialty conference held by ACWUA in Morocco in January 2010.

- ABRI supported ACWUA in its relationship with two non-USAID donors: GTZ and SIDA. In the case of GTZ, ABRI consulted with them during the mid-year review of the activity, the result of which was a year extension of their support to ACWUA. For SIDA, ABRI participated in their consultations with ACWUA as they considered ACWUA's proposals for support of two of their TWGs, both of which SIDA agreed to fund.

- ABRI initiated an activity to provide communications technical assistance to ACWUA to develop an action plan and templates consistent with the communications strategy cited in the business plan.

- ABRI initiated an activity to provide targeted technical assistance to ACWUA in staff capacity development and consumer relations management. Being a fledgling association, ACWUA requires well-trained and clearly directed in-house staff that can fulfill the association's many requirements and a consumer relations system to help it communicate with members. The Management Expert is working with ACWUA's management and staff to clarify roles and responsibilities and to determine the most appropriate consumer relations software considering ACWUA's five-year business plan.

Lessons Learned

- ACWUA's lack of a technical team posed an impediment in the quick and efficient implementation of activities. As such, in order for the work to flow easily and efficiently, it was essential for ACWUA give priority to recruiting the staff required for the successful operation of the association.

- ACWUA's priorities and needs changed over the course of ABRI's lifespan. As such, it was helpful to have built flexibility into the scope of technical assistance to accommodate the association's changing priorities, in addition to having available resources within the association to work on the project.

- The fact that the association is a regional body requires large amounts of funding for any meeting involving working committees composed of its members. Organizers need to adequately account for this when developing the project budget. Furthermore, and for the same reason, any activity that involved the participation of committee members from the Board of Directors or member utilities proved to be difficult to manage as they required proper planning and consideration of time, scope, and funding, in addition to having the commitment of the working committee members to participate in all meetings.

3.2 AFWA AND UTILITY TWINNINGS

Introduction

The African Water Association is the apex organization representing water and wastewater utilities on the African continent. The organization recently launched a new initiative, the Water Operators Partnership – Africa (WOP-A), which will be the African affiliate of the Global Water Operator Partnership (WOP) program called for by the United Nations Secretary General and coordinated by U.N. Habitat. The basic strategy of the initiative is to achieve accelerated utility

improvements through more intense and systematic knowledge sharing by means of peer to peer utility partnerships.

Approach

The premise of the WOP-A program is that in spite of shortcomings, African utilities themselves have a range of locally appropriate, good practices to be shared between them and that there are already a number of African utilities that are strong sector performers. Over the last decade in Africa, more than 30 African countries have implemented institutional reforms of water and sanitation services. Some reforms have been more successful than others, but all provide lessons to be shared in the sector. Until now the trend has been to bring in external and/or non-utility consultants to engage with water and sanitation utilities on specific, short-term projects for institutional capacity building. These consultancies have not always led to sustainable solutions. Supporters of the WOP program approach believed that there is real potential for using twinning and the utility to utility partnership approach to improve practical utility operational problems, such as reducing non-revenue water and increasing revenue collections. There is an outstanding need, however, to recruit initial utility partners, prepare sample program materials and documents, and launch the first pilot exchanges. ABRI had the resources necessary to jump-start the WOP-A program.

Achievements and Results

USAID/Washington and ABRI consulted with USAID/Sudan's senior water advisor in Juba and described the WOP process and the potential for using a program of utility partnerships to strengthen the Southern Sudan Urban Water Corporation (SSUWC). After an agreement in principle from USAID/Juba, ABRI staff then contacted senior officers at Uganda's National Water & Sewerage Corporation (NWSC), one of Africa's leading water utilities, and briefed them on the potential opportunity with SSUWC. ABRI staff went to Juba and held follow-up meetings with other senior USAID officers and with staff members from both the SSUWC and its parent Ministry of Water Resources & Irrigation. ABRI also met with the principal other donors in the water sector and outlined the WOP process. All parties were supportive and in agreement that the process should continue.

ABRI worked with USAID/Sudanand NWSC to assist in the development of a Memorandum of Understanding between the two utilities, which was then signed by the respective Ministers in a February 2010 signing ceremony in Kampala, Uganda also witnessed by the AfWA Secretary General and representatives of USAID/Uganda. The work program consists of a diagnostic analysis of the structure and responsibilities of SSUWC and a comparison of its regulatory framework with that of the NWSC. The goal is to deliver a mutual work product that will improve the effectiveness of the SSUWC's delivery capacity and to provide options for future direction for the Southern Sudanese Ministry of Water and Irrigation. The partnership will be initially funded by ABRI and then turned over to USAID/Sudan. The parties believe that the partnership may well outlast the period of donor support and become a sustaining activity.

Lessons Learned

- Water utilities, and their regulatory bodies (usually Ministries), are enthusiastic and supportive of peer to peer learning.

- USAID Missions, especially regional USAID Missions, and their implementing partners, can play a useful catalytic role in structuring WOPs that transcend national boundaries.

- Utility apex organizations, such as AfWA, can be ideal champions of the WOP concept and can assist their members' in networking with each other and identify technical areas of common interest.

- Once the utility apex organization has networked its members and created a tentative WOP, a donor organization can play an essential role by assisting the emerging utility in carrying out its responsibilities under the partnership.

- WOP arrangements capture local support for more effective regional integration and may well mobilize local sources of financial support, thereby enhancing sustainability.

3.3 AFRICA WASH TRAININGS

Introduction

With the passage of the Paul Simon Water for the Poor Act in 2005 and the resulting "hard earmark" in the FY '08 Appropriations Act, USAID's Water Team decided that there was a need to develop a "Water, Sanitation, and Hygiene (WASH) Overview Course," which would be offered to USAID field staff, starting with US Direct Hires (USDH) and Foreign Service Nationals (FSN) who were stationed in Sub-Saharan Africa. ABRI was asked to support this activity, provide logistical assistance and to design a field trip to complement each course offering. The activity had two distinct phases: curriculum design and Africa field delivery. The team decided that the course would be delivered three times in FY09 in Southern Africa (Maputo, Mozambique), West Africa (Dakar, Senegal), and East Africa (Nairobi, Kenya).

Participants of the Dakar, Senegal WASH Training
June 2009

Approach

The course had four distinct objectives:

- To describe why the WASH sector was important to USAID;
- To discuss and apply institutional and legal requirements to USAID programming in the WASH sector;
- To examine proven interventions in WASH that are available to accomplish WASH objectives; and
- To plan how to apply USAID resources and programming mechanisms to address challenges and comply with regulations in the WASH sector – leading to effective and responsive WASH programming.

In addition, the course had a distinct methodology: it was to be highly participative and interactive with few stretches of concentrated lectures; it was not to be "death by PowerPoint." To this end, ABRI engaged Training Resources Group (TRG) to retain a senior trainer familiar with this method of adult professional instruction. The Water Team, however, assembled and structured the course content relying on external resource persons for assistance in creating methods and techniques of interactive delivery. They developed group exercises and "games" as ways of delivering content messages more effectively and were inserted as segments between lecture periods.

The team structured the WASH course so that it took place from Sunday evening to Friday afternoon with Wednesday devoted to a field trip, which ABRI managed and tailored to each course session. ABRI was also responsible for the final compilation of all course materials, transporting these materials to the field, selecting the hotels and/or course venue, and managing all in-country logistics and payments, including actual support to the course facilitator and the presenters.

Participants of the Nairobi, Kenya WASH Training during the site visit to Naivasha
October 2009

Achievements and Results

ABRI assisted with the WASH curriculum development, retained the course facilitator though its sub-contract with TRG, and managed all logistical preparations, including planning and designing the field trips, selecting and contracting the hotel and course venues, selecting outside speakers, and the final coordination of participant travel.

ABRI directly supported the three course sessions in FY09 in Maputo (May 2009), Dakar (June 2009), and Nairobi (October 2009). Participants highly rated the ABRI designed and managed field trips to view actual water and sanitation conditions in peri-urban and urban settlements – many of whom had never walked through an African low income, high density settlement in their careers. Approximately 20 USAID participants (USDHs and FSNs) attended each session and a representative from the Bureau of Oceans, Environment, and Science (OES) under the Department of State joined in Nairobi.

The course evaluations were overwhelmingly positive from all 60 participants and a number of them ranked the ABRI designed field trips as amongst the top sessions. While it is too early to track most USAID mission program changes as a result of the course, some developments seem to stand out. During the Maputo course, the first conversations were held with a staff member from USAID/Sudan concerning the relevance of the WOP concept to SSUWC's situation. ABRI staff participated in these conversations and then followed up over the next few months. A direct result of these conversations is the on-going Water Operator Partnership between SSUWC and NWSC. A second direct result of the WASH course seems to be the development of a broader water sector program in USAID/Kenya. Finally, a Foreign Service

National Professional from the Nigeria Mission attended the Dakar course and became convinced of the need to develop a balanced water program. Thus the program not only included assistance to rural areas and small communities, it also included direct support to the State Water Boards, the urban and peri-urban water providers.

Lessons Learned

- The overwhelmingly positive evaluations from the 60 course participants demonstrated the success of the highly interactive method of the WASH course in which very well thought out group exercises and "games" were used to reinforce major course "messages". This methodology should be used in any future ABRI courses and indeed for USAID courses as a whole.

Participants apply their newly acquired WASH knowledge during a group activity in Kenya.

- In every case, the ABRI-designed field trips were rated highly and were deemed an "essential" element of the course. In each case, the successful field trip depended on ABRI's existing informal partnerships with local sponsors (Dakar's water and wastewater utilities and NGOs, such as Water & Sanitation for the Urban Poor [WSUP] and Ecotact).

- As expected, course participants had very little exposure to the water sector prior to the course, and, with a couple of exceptions, no exposure to peri-urban or urban problems or to water utilities.

3.4 WASH PROGRAMMING GUIDELINES

Introduction

In 2005, Congress enacted and the President signed the Paul Simon Water for the Poor Act. This legislation was followed by the FY'08 Appropriations Act which created a hard earmark for USAID water expenditures in Sub-Saharan Africa. The hard earmark mandated a spending level substantially in excess of historical levels for water and sanitation. At the same time, the Agency finally received Congressional approval for a large increase in its contingent of Foreign Service Officers (FSOs) through the Development Leadership Initiative that involved assigning new FSOs to the field. USAID's Water Team realized that these two developments meant that a number of Missions in Sub-Saharan Africa would be starting new water programs without prior experience and that, in some cases, the FSOs involved would be first tour officers. The Water Team devised a two-prong strategy to address the problem: (a) design a WASH field training program for initial delivery in Sub-Saharan Africa (see section 3.3), and (b) develop a specialized tool, the "Programming Guidelines for Water, Sanitation, and Hygiene: A Design Manual for USAID Staff," to serve as a "comprehensive 'one-stop' guidebook" or workbook for

field staff faced with questions of water sector program design. The Water Team asked ABRI to take the lead with them on both initiatives.

Approach

USAID had substantial ambitions for the "Programming Guidelines for Water, Sanitation, and Hygiene: A Design Manual for USAID Staff": it was to be far more than a mere procedural handbook or guide to other existing resources. The Programming Guidelines were conceived of as a handbook to guide the new professional through the creative process of conceptualizing and designing a water and sanitation program. The scope of work for this activity charged ABRI with "focusing the content of the WASH Programming Guidelines on the decision-making process, developing a clear and logical step by step approach to selecting and prioritizing the programming options. ABRI will devote significant attention to which questions to ask and which issues to address as well as where to go for answers to these inquiries." The approach is reflected in the opening chapter: "The manual offers a step-wise procedure for identifying and thinking through concrete problems, ways to analyze and unravel situations, and a broad menu of options for addressing them. It is not a generic design document. Its goal is more focused: to provide you, as a USAID development professional, with the tools to shift smoothly into WASH sector project design" (p 1-2). The Programming Guidelines were meant to equip development professionals with the tools to master the design process and assist in the preparation of necessary procurement documents including the statement of work (sample statements of work were provided in one of the annexes).

ABRI's Chief of Party took the lead and assembled a large expert team to tackle the assignment. The team's Africa experience stretched from urban utility reform to rural sanitation and hygiene while including specialties such as gender, finance, and regulation. The task was first to map the actual USAID existing water sector program design process, an exercise that had not previously been attempted and which proved to be challenging and time consuming. The team also examined how the process might differ when examined from a rural, peri-urban or urban utility point of view (case studies were provided in an annex covering each settlement type).

After a rigorous process of analysis, discussion and review, the team segmented the water sector decision making process into ten steps clustered into four basic stages: identifying the WASH problem, defining the project components, selecting the activities and fine tuning the design. After each general stage a worksheet was provided to assist the user in assembling the necessary information and test it against the criteria provided. The framework was as follows:

Identifying the WASH Problem

- Step 1: Understand USAID and National Interest
- Step 2: Describe the WASH Context
- Step 3: Identify Priority WASH Problems
- Step 4: Analyze WASH Problems and Select One for USAID Intervention
- Summing Up: Worksheet One

Defining the Project Components

- Step 5: Assess Causes of the Problem and Determine those of Highest Priority
- Step 6: Organize the Project into Components
- Summing Up: Worksheet Two

Selecting the Activities

- Step 7: Select Activities to Implement
- Summing Up: Worksheet Three

Fine Tuning the Design

- Step 8: Determine the Most Relevant Essential Elements
- Step 9: Incorporate the Essential Elements into the Design
- Step 10: Finalize Design for Statement of Work
- Summing Up: Worksheet Four.

Nine extensive annexes were also prepared for the Programming Guidelines as follows:

- U.S. Government WASH Framework
- Introduction to the WASH Sector
- Reaching the Poor
- Case Studies (Rural, Peri-Urban and Urban)
- Project Activities
- Helpful Resources
- Bibliography
- Statements of Work (RFAs, RFPs and RFTOPs) and
- Glossary of Terms.

During the latter half of 2009, ABRI engaged in an iterative review process of the successive drafts of the Programming Guide with USAID's Water Team. In January 2010, USAID distributed the latest version to selected field Missions for their review and comment. At the same time, USAID instructed ABRI to seek specialized external reviewers for the areas of gender equity and anti-corruption. ABRI made contact with two specialized NGOs, Women for Water and the Water Integrity Network. These groups both agreed to review the draft and make appropriate comments in their areas of expertise.

Achievements and Results

USAID has accepted the manual and in the process of installing it on the intranet. ABRI anticipates that this document will be widely used by USAID Missions around the world as they expand their water and sanitation sector programming. ABRI also anticipates that the document will have a significant impact on other donors who have expressed interest in reviewing and adapting it for their own purposes.

Lessons Learned

- Documenting and outlining the creative process of project design is a formidable task which calls for team participation and an iterative learning process.

- To remain an effective tool, the Programming Guidelines must be continuously updated with user feedback and to reflect legislative or budgetary changes.

- The manual requires a parallel effort to develop a training module for Mission staff.

3.5 MICROFINANCE AS AN ALTERNATIVE FINANCING TOOL

Introduction

Recent studies have shown that the poor are willing to pay for access to water and sanitation services, yet they lack access to financing and low-cost solutions. USAID has been a leader in developing innovative financing tools to help improve access to water and sanitation by the poor by setting up water revolving funds, tariff structures and other models that are directed at utilities and infrastructure service providers. It has also supported and capacitated the microfinance sector that provides credit, savings, insurance and other financial products to individual households, self-help groups, and small entrepreneurs. Two USAID-funded programs – the Environmental Services Program (ESP) and Alternative Pro-Poor Sanitation Solutions (APSS) – are among the few that have combined the two and developed models incorporating microfinance as a substantial financing element of a water and sanitation model. Within the past few years, a handful of NGOs and microfinance organizations have begun to explore this innovative financing model and have reported some success. However, these models are not well known. ABRI saw not only the need to increase knowledge sharing and disseminate case studies, best practices, and lessons learned, but also the opportunity for USAID to play a leadership role in articulating the business case, raising awareness in the international community and catalyzing a network of interested parties that could learn from each other and collaborate on joint investments in this field.

Approach

Following initial conversations in August 2008 during World Water Weekwith Water.org (formerly Water Partners International), the International Water and Sanitation Center (IRC), and the Bill & Melinda Gates Foundation, ABRI sought to convene a roundtable on the topic in the United States. Depending on the success, we would then target another in the Middle East region. We would also try to get the topic on the agenda of a regional water association – ACWUA or AfWA – to enhance the poverty orientation thematic discussions.

Our initial approach did not include promoting the topic at international conferences. However, given the level of interest at the first roundtable, and the group's request to identify more case studies and to raise the awareness among a broader global audience, ABRI worked with partners to develop half-day seminars at the World Water Forum 5 and World Water Week 2009.

A key element to our approach was also to work closely with USAID's Development Credit Authority (DCA) in sharing contacts and jointly developing the roundtable and WWW 2009 agendas, as well as reaching out to USAID's global health office and Sanitation Working Group, which has an objective to support financing solutions for sanitation.

Achievements and Results

On November 5, 2008, ABRI, in collaboration with USAID's DCA, convened a roundtable in Washington, D.C. to assess interest in microfinance as an alternative financing tool for water, get feedback from Microfinance Institutions (MFIs) on requirements to enter the market, discuss the donor's role, as well as solicit partner engagement for future projects. Four different business models from Water Partners International, USAID-funded ESP and APSS programs and CARE International were presented to a group of 19 organizations representing MFIs, social venture funds, implementers, NGOs and professional associations. Attendees included:

Aga Khan, Accion, Opportunity International, CHF International, Sa-Dhan, Women's World Banking, the Bill & Melinda Gates Foundation, ARC Finance, Shorebank, AED, BORDA, Development Workshop/Angola, Development Alternatives Inc, Development Innovations Groups, International Water Association, and IRC.

Overall, participants affirmed that there is a business case for MFIs to offer microfinance for water and sanitation products and services, in particular for those MFIs already offering housing products and who are in a competitive market and interested in expanding their customer base. However, when discussing how to take it to scale, implementers and MFIs require more detailed documentation on costs of product development, implementation, and management to encourage investment. Donor activities should focus on facilitating cross-sector partnerships, providing guaranteed loans to reduce capital costs, and funding market research, training components and an online matching platform. The latter would allow interested parties (e.g. NGOs, water and sanitation service providers, MFIs, and investors) to connect and co-develop programs for implementation.

Following the success of the Washington, D.C. roundtable, ABRI conducted one-on-one meetings with MFIs in Egypt and met with SANABEL, the Arab Network of Microfinance Institutions, to discover case studies and assess interest for a roundtable in the Middle East. The MFIs expressed interest and ABRI scheduled a meeting with six MFIs (LEAD, Alexandria Business Association, Christian Evangelical Organization for Social Services, Aga Khan First Microfinance, Dakahleya Business Association Community Development, and Egyptian Business Association) in Egypt organized by SANABEL. Unfortunately, on the day of the roundtable, no participants showed up. We believe it was because the association management did not have time to effectively position the purpose of the meeting and assess level of commitment to attend. The annual SANABEL conference planned for May 2009 in Beirut, Lebanon offered another opportunity for a microfinance roundtable in the Middle East. While we did not pursue this due to a redirection of ABRI funds, we did connect with Bill Tucker, Executive Director of the Washington-based global Small Enterprise Education and Promotion (SEEP) Network, to explore future conference seminars on the topic, thereby raising awareness of the product development potential and increasing the prospects of more MFIs joining the discussion.

On the international front, we continued to promote the topic. During presentations and group discussions at World Water Forum 5 (Istanbul, March 2009) and World Water Week 2009 (Stockholm, August 2009), ABRI widened the discussion and stakeholder group to explore whether microfinance can be a viable, sustainable option in providing affordable financing to the poor for water and sanitation. About 100 people attended both seminars. Seminar synthesis reports are available online at www.worldwaterweek.org. The Gates Foundation and USAID-DCA co-moderated the World Water Week 2009 seminar and generated a lively discussion between the seven expert panelists on the specific program approaches (e.g. urban vs. rural; sanitation vs. water access market; household vs. community solutions) and business case challenges (e.g. market research, subsidies, legal structures, financing mechanisms).

By bringing these different actors together, ABRI created a network that continues to communicate with each other and fostered new program collaboration. Here are a few results of ABRI's partner network facilitation:

- Opportunity International began research on water and sanitation and indicated its interest in conducting a project within the next year or two (2010/2011).

- The SEEP Network initiated discussions with USAID to consider developing a Practitioners Learning Program (PLP) for MFIs to pilot microfinance for water and sanitation projects.

- Water.org will serve as a partner to CHF International and Triple Jump as they vet MFIs who can benefit from funding and capacity support.

- CHF International and Water.org are partnering on proposals in Africa and Haiti.

- WASTE and CHF International are exploring partnering opportunities in India to find ways to augment the FINISH program, focusing on the urban areas and leveraging Water.org's urban program in India. These activities will seek to leverage a $6 million global program with the Gates Foundation

- CHF International and the Finnish Embassy are exploring how they can partner in Ethiopia in order to bring the Finnish Embassy's Community Development Fund model to the Somali-area where CHF has a presence.

- Triple Jump connected with World Vision's watsan specialist who expressed interest in promoting watsan microfinance among their MFIs.

- Triple Jump shared that other investment groups have expressed interest in funding their Water Fund once it is launched. (Note: SNS-REALL is providing the seed funding for the Water Fund and also for the WASTE program).

Through its microfinance and general alliance building activities, ABRI was also successful in capturing the interest of the European Union Water Initiative – Finance Working Group (EUWI-FWG), which approached ABRI to learn more about what is needed to promote microfinance in their upcoming 3-year strategy. ABRI set up a meeting with USAID's Carl Mitchell and John Wasielewski and EUWI-FWG's Chair, Johan Holmberg and NGO member (BORDA president), Stefan Reuter. In the meeting, the EUWI-FWG invited USAID to jointly design an online platform that could link watsan service providers and interested microfinance institutions who wish to co-develop programs. Both parties were interested in this collaboration and began work on a concept paper.

Lessons Learned

- More rigorous documentation is needed on costs and quantifiable benefits for different stakeholders in order to make a convincing business case.

- Interest in microfinance for water and sanitation has gained increasing momentum over the past year alone and interest in collaboration is great, yet a mechanism through which to facilitate connections is still lacking.

- There is a need to educate MFIs, ministries, utilities, NGOs, and investors, yet initial discussions should be conducted within a discrete sector to establish a baseline of understanding and keep the discussion focused and productive.

- Creating sustainable microfinance solutions requires access to finance across the water and sanitation value chain, providing access to funding not only for demand-side (poor households and self-help groups), but also for the supply side (small watsan entrepreneurs,

community service providers, MFIs and others requiring mezzo-level financing, loans and guarantees).

3.6 AFRICA NON-REVENUE WATER MANUAL AND CONFERENCE

Introduction

During the last decade, over 30 African countries have launched ambitious regulatory and policy water sector reform programs. A common goal of these programs has been improving the operations of water utilities. The starting point for practical utility reform has often been initiatives to improve revenue collections and also to improve utility asset management. A common measure of asset management is a calculation of the percentage of "non revenue water" (NRW), i.e. the difference between the volume of water treated and put into the system compared with the volume that is actually billed. The difference is labeled NRW, and it can be used as a principal diagnostic for "benchmarking" the utility's operations, or asset management, with similar utilities in the country, region or internationally.

While Singapore is often looked to as the global leader with NRW values in the single digits, some leading southern Africa utilities have achieved ratios in the 15-20% category. Unreformed, emerging utilities can have ratios that exceed 60%, i.e. more than half of the water that the utility is producing is being lost through leaks, faulty equipment, or theft. During 2006, the World Bank's Water & Sanitation Program (WSP) and the African Development Bank began an African benchmarking exercise that ultimately covered over 100 African water utilities. This exercise began to make NRW statistics available for a large number of utilities (not all of those surveyed were able to calculate a NRW figure) and demonstrated the fact that there was substantial room for improvement in many utilities. Benchmarking also revealed that Africa's leading utilities were amongst the global top performers and were very capable of assisting the emerging utilities through programs, such as the Water Operator Partnership-Africa. The benchmarking exercise had highlighted the problem, but there were no practical, customized tools available to the water utility manager in Africa.

Approach

Some years ago, Eco-Asia, ABRI's sister program for Asia, sponsored a NRW Manual for Asia that was aimed at emerging water utilities. Malcolm Farley, a British NRW expert with substantial experience in developing countries, led the team that developed the manual. The team's product immediately enjoyed a positive reception and substantial use as a blueprint for reform efforts. AfWA, the continent's apex utility association, was also aware of the importance of NRW and the fact that there was no existing handbook written especially for managers' of African utilities. The Secretary General of AfWA, Sylvain Usher, supported ABRI's production of a new publication, "The Manager's Non-Revenue Water Handbook for Africa: A Guide to Understanding Water Losses," and wrote the following as a Foreword to the new publication:

"One of the major challenges facing water utilities in the developing world is the high level of water losses – from physical losses (leakage), theft of water from the system, or because water users are not being properly billed. This difference between the amount of water put into the distribution system and the amount of water billed to consumers is known as "Non Revenue Water" (NRW). This has a serious effect on the financial viability of water utilities through lost revenue, lost water resources, and increased operational costs, reducing their capacity to fund necessary expansions of service, especially for the poor.

For too long NRW management has been given low priority by government officials, utility managers, donors and the water sector in general. However, over the last decade perceptions have changed rapidly, particularly in the developed world. The International Water Association (IWA) has acknowledged this trend by forming the Water Loss Task Force (WLTF), which over the last 8 years has played a major role in developing, standardizing and disseminating methodologies for addressing NRW.

It is now widely acknowledged that NRW is a key indicator of a utility's operational and financial performance. A high level of NRW normally indicates a water utility that lacks good governance, autonomy, accountability, and the technical and managerial skills necessary to provide a reliable service.

The African Water Association (AfWA) has identified NRW as a priority issue within its capacity building programs, delivering technical sessions to raise the awareness of African water utilities to NRW. Challenges include:

- Old pipe networks dating from the independence period of the 1960s;
- Lack of knowledge of the water networks (inadequate records, rapid urbanization); and
- Low perception of NRW by utility management.

Recently established in Kampala, Uganda, AfWA's African Water Academy is dedicated to leadership development and change management, specializing in capacity building for senior utility managers. The Water Operators' Partnership Africa Program (WOP Africa) is also enhancing utility to utility capacity building. These are two major instruments that AfWA will be using to deliver high level management and technical training to address NRW" (pp vi -vii).

Using some key messages, the Manager's NRW Handbook for Africa leads the utility manager through the stages of addressing NRW; first, understanding and quantifying NRW, and then developing a strategy to address it.

Chapter 1 examines the scale of NRW, and emphasizes the challenges to African water utilities. Utility managers and operational staff should be committed to managing NRW as a long-term process that incorporates numerous aspects of water operations. Addressing NRW is the responsibility of managers across the water utility, including finance and administration, production, distribution, customer service, and other departments. Utilities must end a cycle, known as the 'Vicious Circle', where companies face increased NRW, financial losses, limited investment and poor service. Instead, utilities should follow the 'Virtuous Circle' that enables them to decrease NRW, improve efficiency, preserve financial resources and promote strong customer satisfaction and willingness to invest.

Chapter 2 highlights the need to understand and accurately quantify NRW as an indicator of a water utility's operating efficiency. The International Water Association (IWA) water balance is an excellent method for utility managers to break down and identify the key components of NRW. Ensuring the accuracy of data used to calculate the level of NRW is also essential in understanding the full problem. Collecting accurate data from production meters and customer meters helps to measure the true NRW level. In addition, the customer billing cycle must be factored into NRW calculations to ensure that the time period used for the consumption volume measurement matches the production meter volume measurement.

Chapter 3 considers the requirements to develop a NRW reduction strategy. Utilities need to consider establishing an NRW management team to develop a strategy, ensure that all components of NRW are addressed, and verify that the proposed strategy is feasible and practicable in terms of the workload and budget. Choosing the right team members promotes ownership among the various utility departments involved in the strategy's implementation, and also facilitates consensus at the senior management level. As a first step in developing the strategy, the team should set an initial utility-wide target for NRW reduction based on the economic level of NRW. The team can balance the financial and water supply objectives of the strategy using the water balance results, while aiming to shorten the awareness, location, and repair (ALR) times in addressing water losses. The NRW strategy may cover a period of four to seven years. As a result, pilot projects can help water managers understand the full budget and resources required to implement the entire strategy.

Chapter 4 emphasizes the level of awareness required at all levels - from top decision-makers to the end consumer - that is critical for a successful NRW reduction program. Support from the program's top-level management, and the budget required, has a 'cascade effect' on other levels of management and promotes the financial sustainability of the strategy. Middle management and staff must understand their roles and responsibilities in reducing NRW, since it requires a long-term, combined effort from all departments in the utility. Also, reaching out to customers helps increase their awareness of NRW and how reducing water losses results in improved water supply and quality.

Chapter 5 addresses commercial losses. Commercial losses represent lost revenue, and even a small volume will have a large financial impact. They occur mostly through tampered meters, aging and improperly maintained meters, unauthorized connections, administrative errors and even corrupt practices during the meter reading and billing process. Utilities should invest in training for meter readers, staff, and crews, as well as in accurate meters and a robust billing system, which can directly result in higher returns. In addition, collaboration from the public and certain government departments is required to overcome theft and illegal use of water.

Chapter 6 examines physical losses. These include leakage on transmission and distribution mains; leakage and overflows from storage tanks; and leakage on service connections up to the customer meter. Leakage from transmission and distribution mains are usually large events that can cause serious damage, but the public typically reports them rapidly, followed by the utility repair on an emergency basis. Other types of leakage are more difficult to detect and repair. A successful leakage management strategy requires pressure management, active leakage control, pipeline and asset management, and speedy and quality repairs.

Chapter 7 deals with zoning. Dividing an open water supply network into smaller, more manageable zones or district meter areas (DMAs) is now internationally accepted best practice. It enables the utility to better understand the network and to more easily analyze pressure and flows in problem areas. The criteria for establishing DMAs include the size (or number of connections); number of valves that must be closed; number of flow meters; ground-level variations; and visible topographic features that can serve as DMA boundaries. Utility managers use the minimum night flow (MNF) and legitimate night flow (LNF) to calculate the net night flow (NNF), along with commercial losses, to determine NRW in a DMA. Establishing DMAs helps to manage pressure, improve water quality, and enable continuous water supply.

Chapter 8 gives an indication of the range of performance indicators (PIs) available to utility managers. PIs are an aid to measuring progress in reducing NRW, developing standards, and prioritizing investments. The International Water Association (IWA) recommends the

Infrastructure Leakage Index (ILI) as the best performance indicator for physical losses. Currently, the best PI for commercial losses is to express them as a percentage of authorized consumption. The IWA is developing another indicator for commercial losses - the Apparent Loss Index (ALI). Utility managers should develop and implement monitoring programs to ensure their NRW targets are being met.

Chapter 9 discusses some options for building capacities for managing NRW through 'twinning' arrangements, or utility to utility partnerships. Water service providers worldwide have demonstrated the value of twinning, or focused and sustained exchange between practitioners, in promoting the adoption of improved policies and best practices, and in building human and institutional capacity. Twinning partnerships rely on counterpart exchange to help strengthen the capacity of a utility to improve services delivery (such as NRW reduction), expand services, or convert to continuous water supply. Effective twinning partnerships are demand driven, address the interests and priorities of partners, are results oriented and aim at the adoption and replication of best practices from one partner to another. There are several good examples of twinning projects in Africa, supported by AfWA and WOP, which disseminate, replicate, and strengthen the results of such twinning partnerships.

NRW is a global problem requiring a management strategy that can be globally applied. Developing such a strategy requires a diagnostic approach – firstly to identify the problem, and then to use the available tools to reduce or remove it. Following a step-wise process - asking some basic questions about the utility policies and practices - then applying the appropriate tasks to answer them – is the basis of a successful strategy development.

The philosophies, concepts and recommendations contained in the Managers' NRW Handbook closely reflect international best practice, particularly those recommended by the IWA and the World Bank Institute. If African utilities apply the approach recommended in the Handbook they will rapidly benefit from a greater understanding of their networks' performance, and will have an increased knowledge of the tools available to identify and reduce their levels of NRW.

Achievements and Results

ABRI secured the services of Malcolm Farley for the production of a new, practical publication, "The Manager's NRW Handbook for Africa," based on the original Asian volume. ABRI also secured the agreement of the Secretary General of AfWA to write the Foreword to the NRW Manual. At the same time, ABRI applied, on behalf of USAID, to host a NRW session at the 15th AfWA Congress to be held in mid-March 2010 in Kampala, Uganda. ABRI used the conference session to showcase some of the African NRW success stories and to advocate the establishment of WOPs structured around a NRW theme. The first edition of the NRW Manual for Africa was completed in February 2010 and the Congress session was held on March 17, 2010 in Kampala in front of a large and enthusiastic audience. USAID's Carl Mitchell and the International Water Association's Paul Reiter opened the seminar with words of welcome. Malcolm Farley chaired the technical presentation, launched the NRW Handbook, and introduced speakers from the World Bank's Water and Sanitation Program, RTI, IWA, and Uganda's National Water & Sewerage Corporation. African utility managers expressed the opinion that the Manual would assist them in making initial changes in their systems to address the NRW issue. Well performing African utilities have opened dialogue with emerging utilities concerning creating NRW-centered WOPs. Finally, AfWA has agreed to continue emphasizing the importance of the NRW issue to its members and to further collaboration with USAID and IWA and others around this topic.

Lessons Learned

- NRW is an excellent proxy and diagnostic for general utility asset management and is an excellent entry point for structuring WOPs and/or introducing a whole range of reform initiatives from internal management contracts, to customer care, to technology upgrades for leak detection.

- The NRW metric, along with the billing and collections metric, are two very important indicators of the condition of a water utility which are usually available and are essential features of a national or regional benchmarking program. A national regulator or national association of local water utilities can use these metrics to drive comparative reform programs.

3.7 EGYPT WATER REGULATORY REFORM

Introduction

USAID/Egypt requested ABRI's assistance with to support water regulatory reform activities in Egypt. It did this through a twinning relation between the Egypt Water Regulatory Agency and the Abu Dhabi Regulatory and Supervisory Board and by supporting an operator certification program and providing Management Information Systems (MIS) and Information Technology (IT) technical assistance to the Egyptian Water Regulatory Agency (EWRA).

The Ministry of Housing, Utilities, and Urban Development in Egypt has mandated the development of a program to certify water and wastewater treatment plant operators through a system of examinations. USAID is supporting that mandate under the Water Policy and Regulatory Reform project which developed an operator certification policy and rated and classified all water and wastewater plants on the basis of size and complexity of treatment process. To complete the certification program, ABRI developed a set of core competencies and the associated exam questions and answers for water lab analysts, wastewater lab analysts, water operators, and wastewater operators.

The MIS/IT activity built upon the USAID-funded Water and Wastewater Sector Policy Reform project (WWSPR), through which USAID developed a web based program management system (PRiSM) for EWRA. The PRiSM system tracked over 2,000 construction projects being managed by five MHUUD Agencies. EWRA requested further reports and system enhancements and with the WWSPR project having closed in September of 2009, ABRI was asked to by USAID to provide the technical assistance to make this possible.

Approach

Operator Certification Program

First, ABRI grouped the operators based upon classifications of plants, followed by the development of core operator competencies for each group. Once ABRI identified the groups and developed the core operator competency, the team developed core competency exam questions and answers. Since each operator certification exam consisted of 50 questions, ABRI developed a databank of 150 questions for each of the four water operator classifications and four wastewater classifications.

MIS/IT Technical Assistance

Once EWRA reviewed the site, they recommended a number of modifications and additions. This portion of the activity focused on addressing their recommendations and involved analysis, design, programming and implementation of these modifications and assisting EWRA in publishing the web site.

Achievements and Results

At the close of the activity, ABRI had developed the following documents for the operator certification program:

- Water lab analysis core competencies
- Water lab analysis operator certification exam questions and answers
- Wastewater lab analysis core competencies
- Wastewater lab analysis operator certification exam questions and answers
- Wastewater operator core competencies
- Wastewater operator exam questions and answers
- Water operator core competencies
- Water operator exam questions and answers

For the MIS/IT technical assistance, ABRI:

- Analyzed the required modifications to the web site and a new design
- Developed the approved design
- Added capabilities for easy administration and management of the web site for updating content
- Provided training to EWRA IT staff on site administration
- Assisted EWRA staff in publishing the site on the internet
- Wrote and delivered the user's guide for the revised website

7 TASK 4: IMPROVE WATER SECTOR PERFORMANCE

4.1 PARTNERSHIPS AND ALLIANCE BUILDING

Introduction

A key element of the Blue Revolution Initiative was to pursue partnerships and alliances with various stakeholders to more effectively address the multiple and complex challenges facing the water sector. ABRI's goals outlined in the March 2008 co-investment strategy sought to engage new actors, catalyze interest across water-related networks, leverage new resources, and extend funding for program activities to survive beyond the contract timeline. ABRI's partnership objectives were fourfold: (1) to promote an open, collaborative approach to development practice, access to development information, sharing of best practices and lessons learned; (2) expand the diversity of technical and others resources available to USAID; (3) improve dialogue and understanding among development partners; and (4) leverage additional resources for improved development impact and sustainability.

Approach

By looking beyond the traditional "water value chain," ABRI engaged non-traditional actors who brought fresh perspectives and additional resources to the water debate. Using this approach, ABRI established, or strengthened, a number of networks of regional and national actors in the water sector.

ABRI's strategic targets included regional and global water utility associations, universities, business associations and networks, foundations, government and corporate investors, and other donors – those who had convening power and a strategic interest in collaborating on different project activities.

ABRI subscribed to the following partnership principle: The opportunity for creating a strategic partnership that ensures buy-in and commitment over time lies in engaging the partner in all stages – design, implementation, and analysis. Otherwise, the relationship could change from a strategic one into a subcontracting one that has a limited lifespan.

Achievements and Results

With regards to engaging new actors and catalyzing interest across water-related networks, the partnership team was successful in meeting its goals. Thanks to ABRI's broad mandate covering trans-boundary water security, water resource management, water supply and sanitation, and capacity building, ABRI's partnership team approached a wide spectrum of organizations active in water and sanitation topics to explore where they might be interested in partnering with USAID. (For a list of organizations contacted, please see Annex B).

The ABRI partnership team was also successful in facilitating and strengthening a number of new key relationships for USAID in the water sector and formalizing strategic partnerships,

such as an MoU with the International Water Association – the leading global association of water professionals with 10,000 individual and 400 corporate members spread across 130 countries – and a program partnership with the Arab Network for Environment and Development (RAED), a more than 200 member network of civil society organizations across seventeen Middle Eastern countries.

The partnership with UN-Habitat and African Water Association members proved particularly useful where ABRI joined a newly established alliance network. In this instance, ABRI's partnership team played a significant role in facilitating USAID's involvement in the Global Water Operators Partnership (GWOPs) program which led to USAID being invited to be a member of the GWOPs steering committee and donor observer to AfWA's AWOPs program, connecting USAID directly with other leading donors such as GTZ, the African Development Bank, UN-Habitat and the World Bank. While difficult to quantify its immediate value, this strategic network of actors supporting water utility capacity strengthening in Africa and the Middle East will certainly benefit USAID in future programming by improving donor coordination and leveraging joint investments.

The partnership teams targets also included (1) securing at least one partnership per target activity (2) convening a number of roundtables (one in the United States on microfinance and multiple presentations at business association events in the Middle East) and (3) making presentations and reports. The results of these efforts are detailed below.

Illustrative Partnerships

Water User Association Commercialization

- CropLife International (www.croplife.org) – provided training for WUA members in Morocco;
- USAID/Morocco – the Moroccan mission expressed interest to continue funding at the national level.

Euphrates-Tigris Initiative for Cooperation

- United National Development Program (www.undp.org) – provided expert contributions and cash for the ETIC seminar at World Water Week 2009 ($6,500 cash) and has expressed interest in providing future funding;
- Dutch Embassy – expressed interest in funding a smaller proposal of 10,000 Euros ($14,500) as well as considering greater funding for the overall program;
- GTZ (www.gtz.de/en) – expressed interest to learn more about ETIC to potentially fund it in the future;
- American University of Beirut (www.aub.le)
- Swedish International Development Agency (www.sida.se)
- Swedish International Water Institute (www.siwi.org)

For ETIC, ABRI focused on speaking to donors who would be open to funding the organization post-ABRI. UNDP, GTZ, SIDA and the Dutch all expressed interest in considering future funding

but needed a proposal from ETIC's leadership to move forward. ABRI helped lay the groundwork for discussions with these donors as well as bring American University of Beirut to the table to serve as a funding mechanism for the organization. ABRI initially saw private sector GIS companies as potential targets, but ETIC did not see the need for this at the present stage of the program.

Water Utility Capacity Building

- IWA (www.iwahq.org) – signed strategic MOU to partner in four areas: urban water and sanitation, water safety/quality management, leadership strengthening and climate change. ABRI and IWA jointly implemented a work plan to support ACWUA;

- UN-Habitat (www.un-habitat.org) and the African Water Association – invited USAID to participate in the GWOPs and African-WOPs programs at various steering committee meetings, conferences and seminars;

- RAED (www.raednetwork.org) – invited ACWUA and IWA to participate in two national climate change adaptation conferences in Morocco and Egypt;

- Regional Information Technology and Software Engineering Center (www.ritsec.org.eg) – sponsored RAED's national climate change conference in Cairo; and

- GTZ (www.gtz.de.en) – GTZ became part of the ACWUA-ABRI-IWA-GTZ work plan to share ACWUA capacity building responsibilities.

International Water Association

IWA and USAID were strong partners in the Middle East and Africa activities through joint activities with ABRI. IWA added value to ABRI activities in the following areas:

- **Institution Building** – IWA strengthened ACWUA's leadership through direct mentorship at the Senior Management level and through IWA's convening power to bring together water association leaders at the 2009 Stockholm World Water Week to discuss common issues and successes shared by association leaders across the globe. This side event was a big success and will in all probability be continued in upcoming years. Additionally, IWA supported ACWUA by attending the official launch and three team meetings during which collaboration programs were discussed as well as issues of strategic importance.

- **Knowledge Development and Networking** – For ACWUA's benefit, IWA hosted and convened a 3-day meeting at its offices in the Netherlands with the German Water Association (DWA), ACWUA, and ABRI to discuss recommendations and lessons learned for implementing an effective Communications and Knowledge Management system for ACWUA. As conferences are also key to developing knowledge and networks, IWA featured ACWUA in a number of WOPs seminars at international conferences such as the World Water Forum (Istanbul March 2009) and World Water Week (Stockholm Aug 2009). It also committed to working with ACWUA and ABRI to design and convene a best practice conference on cost recovery that would incorporate an agenda-setting workshop to kick-off the ACUWA working group on the topic.

- **Regional Leadership and Global Awareness** – IWA provided international climate change experts as presenters at two national level conferences and workshops in Morocco and

Egypt that were hosted by ABRI partner RAED. Sharing of best practices and requirements for next steps around water and climate change adaptation between IWA, ACWUA, and RAED has been a crucial part in bringing international and regional utility sector perspective to national workshops and forging multi-stakeholder dialogue.

- Another key area of engagement for IWA was the support of the **Global Water Operators Program**. IWA coordinated with ABRI and USAID on how to move the agenda forward.

With IWA's support, ABRI successfully raised the brand profile of ACWUA at the regional and global level to be a voice for the water sector in Middle East. ABRI partnership activities also improved ACWUA's exposure to new global and regional players including donors, ministers, the private sector, and civil society organizations.

ABRI's partnership with IWA also brought heightened brand exposure to USAID at international venues and in the press. The strategic partnership press release was published in IWA's online news channels as well as in their June 2009 Water21 print magazine.

IWA made substantial in-kind contributions in staff and program support, including sponsored travel costs, for the above mentioned commitments.

Arab Network for Environment and Development (RAED)

ABRI's strategic partnership with RAED, a valuable regional partner, served to heighten USAID's exposure to civil society, environmental ministries, and the media in the Middle East, and in particular in Lebanon, Morocco, and Egypt during the "Arab Communities Adaption to Climate Change" national multi-stakeholder workshops. Additional partnership benefits include the following:

- RAED's newsletter, with a monthly circulation of 2,000, raised ABRI brand awareness among the civil society throughout the region by featuring all ABRI activities over a period of 14 months.

- RAED's broad network and contacts with the media in the Middle East garnered much publicity for USAID, resulting in nine online references to the announcement of our strategic partnership in May 2009.

- RITSEC – ABRI solicited co-investment from the Regional Information Technology and Software Engineering Center which sponsored the RAED climate change workshop in Egypt and is looking to partner with them on creating an information exchange platform to educate the region on the impact of climate change and water.

The RAED strategic partnership also served to raise ACWUA's brand profile within the region:

- ACWUA was invited to participate in and present at the RAED national climate change workshops organized in Lebanon, Morocco, and Egypt and to provide the utility stakeholder perspective to the multi-stakeholder discussions with top level government, donor, media, and civil society organization representatives.

- RAED's Dr. Emad Adly made a number of interventions during the 2009 World Water Week sessions in Stockholm in which he referred to ACWUA and the areas of partnership with

RAED and ABRI. He also participated and made a presentation at the Fifteenth Congress of the African Water Association at Kampala, Uganda.

Middle East Center of Excellence for Water

ABRI's partnership team developed an extensive mapping of potential research partners and funders for the Middle East Center of Excellence for Water, including targets from academia, research institutes, international donors, corporate, and public funding organizations and foundations from the Middle East, United States, Europe, and the United Nations.

Women for Water Partnership

ABRI's partnership team sought various avenues to incorporate and highlight the role of women in ABRI activities. In this context, our discussions with Women for Water Partnership (www.womenforwater.org) has resulted in bringing the topic of women in water to USAID and has laid the groundwork for future activities aimed at developing sustainable and gender sensitive community water and sanitation solutions, particularly in Africa. Additionally, ABRI exchanged information and ideas with IWA (www.iwahq.org) as they develop their Women in Water program.

Roundtables

Microfinance Roundtable and Strategic Value Network

- Gates Foundation (www.gatesfoundation.org) – co-sponsored World Water Forum (Istanbul, March 2009) and World Water Week (Stockholm, August 2009); shared contacts to build the network;

- International Water and Sanitation Center (www.irc.nl) – co-sponsored seminars at World Water Forum (Istanbul, March 2009) and World Water Week (Stockholm, August 2009); shared contacts to build the network;

- Water Partners International (www.water.org) – presented at roundtable and co-sponsored seminars at World Water Forum (Istanbul, March 2009) and World Water Week (Stockholm, August 2009); shared contacts to build the network;

- CHF International (www.chfinternational.org) – panelist at World Water Week 2009 seminar; shared contacts to build network; developed new partnerships with others in the network;

- USAID/Development Credit Authority – provided $8,000 to sponsor the microfinance seminars at the World Water Week 2009, USAID exhibition booth and launch of the USAID Water Finance Website; shared contacts to build the network; and

- European Union-Finance Working Group – invited USAID to partner in creating a technology platform in which watsan programs and interested microfinance institutions could be matched to facilitate affordable financing for the poor on watsan programs.

The partnership team held a roundtable in the United States which then served as the foundation upon which to build a strategic value network of Microfinance Institutions, watsan NGOs, and funders who engaged and interested in the topic of microfinance for water and sanitation. The key collaboration partners who co-sponsored seminars with USAID on the topic

at World Water Forum 5 and World Water Week 2009 are listed above. The entire network of 30+ interested parties includes: Accion, the Academy for Educational Development (AED), Aga Khan Development Network, ARC Finance, Bill & Melinda Gates Foundation, Bremen Overseas Research and Development Association (BORDA), BRAC, CARE, CHF International, Centre Régional pour l'Eau Potable et l'Assainissement à faible coût (CREPA), Development Alternatives Inc, Development Innovations Group, Development Workshop, EUWI-FWG, Finnish Embassy in Ethiopia, International Water Association, International Water and Sanitation Center (IRC), MercyCorps, MicroVest, Opportunity International, SANABEL, Sa-Dhan, Scotiabank, SEEP Network, Shorebank, Triple Jump, USAID's Environmental Services Program (ESP), WSP/USAID HIP's Alternative Pro-Poor Sanitation Solutions Program (APSS), Water.org (formerly WaterPartners International), WASTE, and Women's World Banking.

Middle East Roundtables

- British-Egyptian Business Association (www.beba.org.eg) – convened 25 company members from the various industries;
- American Chamber of Commerce, Cairo, Egypt (www.amcham.org.eg) – convened 25 company members from the banking, construction, tourism and IT industries;
- American Chamber of Commerce, Amman, Jordan – convened 15 company members representing primarily the agribusiness industry and exporters;
- Rotary International, Cairo (www.cairorotary.org) – convened 100 company members from various industries.

ABRI successfully convened the four roundtables listed above to introduce the importance of water management to the business community in the Middle East.

Presentations and Reports

One of the key activities for the partnership team was attending conferences, making contacts, and following up with prospective partners in one-on-one meetings as well as communicating and meeting with team members to structure a proper partnership approach. The team developed reports for each of these meetings and has archived all power point presentations created for roundtables and meetings.

Lessons Learned

- Program activities should have enough scope defined up-front to provide a context for partnership discussions – concepts are not enough to create strategic partnerships.
- Regional partnerships require more coordination and time to establish and manage than typical partnerships which target a single, specific location.
- Continual two-way communication amongst team and partner members is essential throughout all stages of collaboration (design, implementation, and analysis).
- The success rate for strategic partnerships will increase if activity timelines incorporate a learning curve for development professionals to understand partnership management.

- It is difficult to assess the level of commitment (in time and resources) that a partner will bring to a joint activity if it is not agreed to in writing.

- When co-investment is targeted, it is important to ensure that expectations for shared roles and responsibilities are aligned and termination criteria are clear from the start.

4.2 BUILDING AWARENESS THROUGH INTERNATIONAL OUTREACH

Introduction

One of ABRI's significant goals was to demonstrate USAID's leadership role in advancing the Blue Revolution on the global level and to raise international awareness for USAID water-related activities in general. A key element in achieving this success was ABRI's active involvement and promotion of USAID's water strategy and programs at four key international water conferences – World Water Week 2008 (August 2008), World Water Forum 5 (March 2009), World Water Week 2009 (August 2009), and the African Water Association 15th Annual Congress (March 2010).

Approach

The partnership team managed international outreach and communications. When we initiated this activity, we began by identifying leading international conferences that addressed water resource management, water sanitation and supply, and trans-boundary water security and management issues. Our objectives were to seek specific promotional activities by which to advertise USAID's contributions to the water sector such as hosting/convening seminars or side events, participating in panels convened by other key international players, building a visual presence through an exhibition booth, creating and distributing marketing communications, and launching new initiatives through press events.

Our strategy was to reach out to conference coordinators via personal communications, not just online submission forms, to understand program decision making criteria and help coordinating bodies understand the unique value-add of ABRI's program contributions. By submitting abstracts on various topics relating to ABRI activities, we increased the likelihood of getting USAID listed as a convener of a seminar in the final program. Additionally, ABRI reached out to partner organizations and the conference coordinators to request co-sponsorship of certain topics of interest. ABRI also coordinated with other USAID departments, regional bureaus, and contractors to ensure all USAID and State Department activities were included in a comprehensive conference marketing package (exhibition booth, flyers, USAID-sponsored events calendar, and press releases).

Achievements and Results

ABRI succeeded in significantly raising the profile of USAID-sponsored programs not only at the regional, but also the international levels, with water partnerships and institutes, business associations, civil society organizations, donors, the private sector, academia, and government agencies. This is evidenced by the speed and immediate willingness to add USAID to seminars and side events convened by others who in the past did not have working relations with USAID's water team.

ABRI began its international outreach by attending the United Nations-Commission on Sustainable Development (UN-CSD) meeting in New York City, May 2008, where it met many

key players. Subsequently, we invited these and other key players to a closed meeting at World Water Week in Stockholm in August 2008 to announce the Blue Revolution Initiative and solicit interest in partnerships from across the development sector. The response exceeded expectations and attracted thirty organizations ranging from donors to associations and water partnerships, private sector companies and NGOs. Given the short notice of the invitations, competing events, and the attendees' full schedules, the 70% response rate was excellent and demonstrates the novelty of the message being sent and the international community's keen interest in learning more. During the meeting, groups introduced themselves and shared which areas of the Advancing the Blue Revolution Initiative interested them. This forum resulted in great opportunities for personal follow-ups with key actors in the international trans-boundary, water and sanitation, and water resource management arenas and gave ABRI the entre to collaborate with other organizations such as GTZ, the African Development Bank, OECD, UN Global Compact, UNDP, UN-Habitat, World Water Council, IWA, IRC, OECD, and Women for Water Partnership, among others.

We also made contacts during the conference that led to collaboration partners to build the Microfinance for Water and Sanitation network, including Water.org, IRC, and Gates Foundation, which facilitated our co-sponsorship of the "Microfinance for Sanitation" seminar at the World Water Forum 5 in March 2009 and "Unpacking the Business Case for Microfinance in Water and Sanitation" seminar at World Water Week in August 2009.

The conferences gave USAID the opportunity to highlight its support of the Euphrates-Tigris Initiative for Cooperation and Track Two diplomacy by conducting seminars at both the World Water Forum 5 in Istanbul and World Water Week 2009 in Stockholm.

ABRI highlighted other USAID water programs, particularly on the Innovative Financing theme such as the Philippines Water Revolving Fund, Jordan Cost Recovery Program, and Development Credit Authority loan guarantee activities.

Through our partnership with IWA and close collaboration with UN-Habitat, ABRI was invited to present at various Water Operator Partnerships (WOPs) side events and seminars.

On average 100 people attended each of the ABRI-sponsored seminars, effectively raising the awareness of USAID's activities through a broad range of Blue Revolution efforts. ABRI also heightened USAID's visual brand presence by designing and coordinating USAID's exhibition booth and marketing materials at both World Water Forum 5 and World Water Week 2009. We designed the fact sheets, booth pop-ups, and banners in such a manner that they can be used by USAID for future conferences in years to come.

Finally, press coverage – both print and online – was also a successful element of the ABRI international outreach objectives. While difficult to calculate the total hits of online readers, we do know that the press releases highlighting the strategic partnerships with IWA and RAED, microfinance seminars, and Water Finance Website launch, as well as the ABRI article on the strategic value network approach, reached a total of 27 Google references.

Through the three international conferences alone – World Water Weeks 2008 and 2009, and the World Water Forum 5 – ABRI reached over many international donors and regional platforms, private sector leaders, and NGOs. (See Annex B for complete list of contacts).

For specific achievements, please see the list below:

- Sponsored or participated as a panelist on a total of 11 seminars:
  - ABRI hosted one seminar at the World Water Week 2008
    - Blue Revolution Initiative: Highlighting Worldwide Successes in Innovative Financing for Water and Sanitation
  - Out of the thirteen sessions at World Water Forum 5 that featured USAID-funded programs and two thematic wrap-up sessions, ABRI helped secure eight seminars:
    - Session 5.1.1: Development Credit Authority
    - Session 5.1.3: Philippine Water Revolving Fund
    - Session 5.2.2: Jordan Cost Recovery Program
    - Session 5.3.2: Alterative Pro-Poor Sanitation Solutions Peru (USAID/HIP)
    - Finance Synthesis Report: Development Credit Authority
    - Session 3.1.1 Boundless Basins: Successes/Failures of Hydro-Solidarity (ETIC)
    - Session 3.4.2: Strategic Framework for Effective and Sustainable Water Resource Management and Protection (ANE)
    - Session 6.3.2: Partnerships with Professional Associations (ABRI)
  - Out of the six USG seminars, ABRI convened and contributed to three at World Water Week 2009
    - Impact of Riparian Collaboration in the Tigris-Euphrates Region (ABRI/ETIC)
    - Water Operators Partnerships: Success Stories and Alliance Building (ABRI/ACWUA)
    - Unpacking the Business Case for Microfinance in Water and Sanitation (ABRI/DCA)
  - ABRI participated in three events at the African Water Association's 15th Congress
    - Co-sponsored a seminar on Non-Revenue Water with IWA
    - Launched the Non-Revenue Water handbook for Africa
    - Sponsored the RAED presentation of the "Arab Communities Adapting to Climate Change: methodology and framework for engaging the civil society" at the IWA-sponsored "Urban Disaster Resiliency Forum"

- Held 7 closed meetings and side events:
  - Launch of the Blue Revolution Initiative (World Water Week 2008)
  - Participation in Partnership Bazaar (World Water Forum 5)
  - Water Leaders Academy (World Water Forum 5)
  - Learning Center – Water Infrastructure Finance (World Water Forum 5)
  - Knowledge Management Cooperation Opportunities in Euphrates-Tigris Region (World Water Forum 5)
  - IWA Dialogues – Water Operators Partnerships (World Water Forum 5)
  - Energy Audits & Climate Vulnerability Assessments of Water Utilities in Africa (World Water Week 2009)

- Exhibited at 2 conferences:
  - World Water Forum 5 and World Water Week 2009

- Produced and distributed marketing materials for:
  - Exhibition booth pop-up, side panels and IWA-USAID partnership banner stand
  - 7 fact sheets on water framework (1), on water program areas (3), water activities by region (3), for DCA (1) and microfinance for water and sanitation (1)
  - 4 postcards on USAID partnerships & alliances, water framework, financing tools and learning center, and Development Credit Authority (DCA)

Created, published, and distributed other marketing materials to promote ABRI programs including:

- Print article in DAIdeas/Developments on ABRI and Strategic Value Networks
  - Print circulation of 3,500 and an email circulation of 4,000 reaching readers across the globe (USAID missions, other bi- and multinational donors, NGOs, development firms, academia, and think tanks)
- Article in IWA Water21 publication on IWA-USAID strategic partnership
- 14 articles in RAED monthly newsletter (March 2009 – April 2010)
  - Monthly circulation of 2,000; total exposure of 28,000 messages over 14 months across the Middle East (civil society organizations, donors, and ministries)
- 3 press releases announcing IWA-USAID partnership, RAED-USAID partnership, USAID Water Finance Website launch
- 27 online references to press releases and articles written
  - 2 references for ABRI-Strategic Value Networks
  - 6 references for IWA-USAID partnership announcement
  - 10 references for RAED-USAID partnership announcement
  - 9 references for USAID Water Finance Website launch
- RAED "Arab Communities Adapting to Climate Change" program brochure
- ACWUA Sponsorship Form (in English and French) for Non-Revenue Water conference

Lessons Learned

- Joining with partners to co-sponsor seminars is a useful way to increase brand exposure, demonstrate USAID's partnership approach, and reduce overall conference marketing expenses.

- Side events can be very successful in generating partner discussions on specific topics and do not require as much preparation or expense as hosted seminars.

- A booth provides a visual brand reminder of USAID activities but requires USAID staff commitment and knowledge of global water programs to ensure interested parties can get the desired information or be connected with the right people for follow-up.

- Generating an audience at press events requires pre-advertising and cannot rely on the conference coordinator's efforts alone.

4.3 MIDDLE EAST CENTER OF EXCELLENCE ON WATER

Introduction

In June 2009, President Barack Obama gave an important speech at Cairo University, called A New Beginning. In that speech, the president promised US support to Muslim majority countries to strengthen science and technology on the world's most challenging and significant issues. In July 2009, the Middle East Bureau of USAID asked for ABRI's support in the design of a Center of Excellence on Water for the Middle East.

Approach

ABRI's COP developed the original concept paper for the Center, as well as a longer design over the past 12 months. He led a small team in December 2009 that visited Egypt, Jordan, Israel, and the United Arab Emirates and was a member of a USG team I June 2010 when he visited Jordan, Kuwait, and Egypt.

The objectives of the visits were to:

- Update US embassies and USAID missions about the status of the Middle East Water for Excellence on Water to engage them in the design and creation of the Center;
- Review the initial design of the Center with governments and other key partners and solicit reactions in order to modify and refine it;
- Identify sources of political support and political coverage for the Center;
- Identify and assess entities in the Middle East that are candidates for the Center as hub or as associates;
- Meet with bilateral donors, governments, the private sector and others that are potential contributors–financial and otherwise–to the Center and initial partners to determine interest and begin to obtain commitments; and
- Develop a final design which reflects the views of stakeholders, addresses their concerns, and encourages their involvement

Achievements and Results

After a year of efforts the following are the achievements of the design effort:

- Buy in and commitment from many USG entities in the effort, including USAID, State Department, Commerce Department, Bureau of Reclamation, US Geological Survey, and US Army Corps of Engineers.
- Growing interest and commitment by US Missions and US Embassies in the region.
- Several meetings with US-based stakeholders through outreach sessions.
- Growing widespread awareness of the effort throughout the region with hundreds of stakeholders brought into interviews for serious dialog.
- Offers of assistance, funds, and partnerships from multiple governments and institutions in the region.
- Clarity in the concept and design of the Center, including technical focus and management structures.

Lessons Learned

- For the Center to be successful, it must avoid politics as much as possible, not focused on bricks and mortar but not be virtual either.
- The Center must be inclusive, not focused on what entity wins and what other lose. A sole entity as the Center will drive away others, undermining the objectives.

- Adequate funds are needed from the USG side to demonstrate its commitment and seriousness.

- Other donors are necessary partners for funding and because the challenges are so great.

4.4 FUTURE WATER LEADERS PROGRAM

Introduction

The countries of the Middle East are amongst the most water scarce in the world and as these issues worsen with population increases, the possibilities of internal and external conflicts over water increase as well. The Middle East and North Africa sub region is home to five percent of the world's people but has less than one percent of the world's renewable fresh water. Growing populations and accelerating urbanization, combined with expanding agriculture have led to over-abstraction of groundwater resources and degrading water quality in many parts of the region. Some 60 percent of the region's water flows across international borders, further complicating resource management. Business as usual in the water sector cannot continue.

The next generation of Middle East water sector professionals will have to tackle some of these difficult issues of sectoral water allocation, water pricing, transboundary regulation of surface and ground water, corporatization of public water utilities, and water re-use, among other concerns. Water leaders and managers across the region recognize the need to focus more on national issues of policy and regulation, of integrated management of water resources, and on regulation rather than direct provision of services. They realize that existing water management approaches, and the associated technical education and training programs, are too narrowly focused. Engineering and economic knowledge has to be combined with an understanding of institutional behavior, leadership and the political dimensions of water governance. Given the ABRI mandate to promote activities that support strategic, sustainable change that will transform the water and sanitation sector, the Future Water Leaders (FWL) program was launched to address the market need for leadership training of mid-level water professionals.

The Future Water Leaders at the Cairo, Egypt course in December 2008.

ABRI was familiar with the many long-term and short-term technical training programs in the water sector. In the Middle East and North Africa, however, leadership and change

management training, including business planning, for mid-level water professionals was mostly lacking. ABRI recognized that if it was to achieve its goal of transforming the culture and governance of water, it needed to start with human capacity development. ABRI also believed that the methodology of adult learning was critical and this too was largely lacking in the Middle East.

The United States excels in mid-level, short course, executive training, such as the short summer programs offered by the Harvard Business School in which the graduates also form part of a continuing network devoted to excellence, innovation and change. This network of graduates functions as a type of community of practice which may be linked electronically and receive on line mentoring, library materials documenting best practices and lessons learned. These leadership-focused training programs stress the importance of the participants understanding of their leadership style and challenges and even include a personal improvement plan. Leadership assessment tools and one on one coaching sessions to review strengths and weaknesses are also often part of the program.

Since ABRI could find neither the course content nor methodology that it felt was essential for FWLs, it undertook to design an experimental initiative, the FWL program, for mid-level, water sector professionals in the Middle East and North Africa.

Approach

ABRI's initial approach to the FWL program was based on the following objectives:

- Create a cadre of people with a vision and are advocates for the Blue Revolution, who have the knowledge to be good resource and organizational managers, and who have the leadership ability to make good decisions;

- Enhance the skills and professional networks of individuals who are on a path toward assuming leadership positions in the water supply and sanitation sector;

- "Institutionalize" the FWL Program so that it becomes regionally recognized and credible program; and

- Connect the FWL Program to some other sponsor or "owner" to ensure the program's sustainability beyond the life of the ABRI task order. The sponsor could be a regional platform (e.g., ACWUA), a large private company (e.g., Coca Cola), an international organization from outside the Middle East (e.g., SIWI), the Institute for International Education (IIE), or a well-known university from within the Middle East (e.g., King Abdullah University of Science and Technology).

ABRI's initial action was to recruit the first cadre of highly promising "next generation" men and women from across the Middle East and to bring them together in a FWL course to examine critical water issues, strengthen their change management and leadership skills, and build ties among them. The concept was to create mid-level "change agents" who would be encouraged to support institutional development and change through short course executive leadership training.

The initial recruitment and selection took place among existing staff at government institutions, the private sector, universities, and NGOs across the region. ABRI believed that it was important to look broadly to find and support the next generation of leaders in the Middle East

and North Africa. ABRI believed that some of the participants should be drawn from outside the government to expand the vision of possible options. Whereas it was always thought that ABRI would be involved in the initial convening of the initial group of "Future Water Leaders," the program from the outset was premised on reaching out to "other donors, foundations and other entities" to ensure sustainability.

The ABRI team released the formal program announcement and call for applications on April 1, 2008, sending hard and electronic copies to over 200 colleagues, government agencies, NGOs, universities, and donors throughout the Middle East. Applications were due by May 1. Upon the final tally, the summary of application data was as follows.

Applicant Data

Summary			Proposing Country *		
Total	105		Jordan	29	(10)
Male	83		Egypt	22	(1)
Female	22		Iraq	16	(2)
Organization Type *			West Bank/Gaza	15	(7)
			Yemen	8	
University	27	(8)	Morocco	5	
Utility	24	(1)	Algeria	3	(1)
National Government	22	(5)	Lebanon	3	(1)
NGO	14	(3)	Tunisia	2	
City/Municipality	8	(1)	UAE **	2	
Private Sector	8	(3)	Libya	0	
Donor	2	(1)	Oman	0	

* Female applicants in parentheses

** UAE applicants are of Egyptian and Jordanian nationality

The ABRI team and USAID reviewed all applicants and then interviewed all high-ranking applicants by telephone, and/or vetted applicants through our trusted counterparts and colleagues in respective host countries. This process resulted in a final list of 26 recommended applicants and 10 waitlisted candidates.

The summary participant data and final list of participants are shown in the tables below.

Participant Data

Summary			Proposing Country *		
Total	26		Jordan	4	(1)
Male	19		Egypt	4	
Female	7		Iraq	3	(1)
Organization Type *			West Bank/Gaza	5	(4)
			Yemen	3	
University	3	(1)	Morocco	3	
Utility	10		Algeria	1	(1)
National Government	7	(2)	Lebanon	1	

Summary			Proposing Country *		
NGO	2	(1)	Tunisia	1	
City/Municipality	1	(1)	UAE **	1	
Private Sector	2	(1)	Libya	0	
Donor	1	(1)	Oman	0	

* Female applicants in parentheses

** UAE applicant is of Jordanian nationality

Independently, ABRI entered collaborated with a number of experts to provide appropriate content to the FWLs and, as far as possible, to follow adult learning techniques, such as experiential teaching methodologies that prioritize interactive dialogue, role play, individual and group work, and an action learning project (either within or external to the participants' organizations) through which to apply and develop the skills being strengthened.

The second stage, therefore, was to identify potential strategic partners through an extensive mapping exercise of existing courses in leadership, change management and water training programs at Middle East and selected global institutions. Once the mapping exercise was complete, the concept was to engage in intensive dialogue with one or two institutions in order to judge the potential for creating a partnership, perhaps also including one or more other donors, and selecting an institutional home for the Future Water Leaders Program.

Achievements and Results

ABRI successfully recruited an initial group of 26 mid level professionals from 10 countries. These individuals had come from a mix of backgrounds as desired with a small majority coming from public utilities followed by other public sector institutions. The initial Future Water Leaders course module took place in August 2008 in Amman, Jordan with the following agenda:

Sunday, August 3, 2008

9:00 Introductions to the instructors and participants; logistics; expectations

10:00 Introduction to the Future Water Leaders Program and ABRI and the context of water supply and sanitation in the Middle East: Dan Rothberg and Ra'ed Daoud

12:00 Formal opening of the FWL Program – keynote speaker: Dr. Hazim Al-Naser, Member of Parliament, former Minister of Water and Irrigation

14:00 Topic 1: Expanding the network to reach the poor – social dimensions; Elizabeth Kleemeier

15:30 Topic 2: Change management as a construct for expanding the network; Dima Jamali

Monday, August 4, 2008

9:00 Topic 3: options and technical and institutional constraints for the use of decentralized systems in the management of water supply and wastewater; Munjed Al Sharif

11:00 Topic 4: financial mechanisms and the role of pricing, tariffs, metering, and billing in expanding the network (session led by Munther Khleifat, former Secretary General of the Ministry of Water and Irrigation, and Ra'ed Daoud)

14:00 Four concurrent groups addressing detailed case study related to each of the four topics

19:00 Dinner at Madaba traditional restaurant (Haret Jdoodna)

Tuesday, August 5, 2008

9:00	Speaker: Dr. Munther Haddadin, former Minister of Water and Irrigation
10:00	Field trip to Jarash (Qairawan spring area)
16:00	Reflections on field trip, team building exercise, and opportunities for individual mentoring and interaction

Wednesday, August 6, 2008

9:00	Preparation of group, questions, and participant presentations to panelists
10:30	Panel discussion: Kamal Al-Zoubi (Director, Miyahuna), Ross Hagan (representative from USAID/Jordan); and Natasha Marashlian (project manager, Cooperative Housing Foundation, Lebanon)
13:00	Four concurrent groups addressing detailed case study related to each of the four topics
16:00	Presentation of options for future case studies and investigation beyond Module 1
19:00	Group dinner at Reem Albawadi restaurant

Thursday, August 7, 2008

9:00	Presentations of four group case studies
13:00	Summary of case studies and overall connection to module them on expanding the network to reach the poor
14:00	Group discussion and self-selection of future study items
15:00	Introduction to Module 2 (regulatory reform); evaluations; and awarding of certificates

Some aspects of the first round of the FWL program were deemed successful by both the participants and ABRI. The program was commended for its instructors, local knowledge and values, and recognition of the importance of leadership and change management training. Participants also stated that they believed that their attendance helped them shape and clarify their career goals. The participants also wholeheartedly adopted the notion of forming an electronic network of attendees who would continue to maintain contact and coach and mentor each other. The participants did also note, however, that the agenda may have been "too ambitious" and that there were time constraints that limited group interaction and questions.

ABRI staff worked to respond to these comments in designing the second FWL module which was held in Cairo, Egypt in December 2008. ABRI made the following improvements over the first module in terms of technical presentation and administration. ABRI also had the advantage of established relationships with the participants and more grounded expectations from both the participants and the organizers. Based on Module 1, ABRI identified seven technical and administrative lessons, each of which was applied to Module 2, with varying impact, as discussed below.

- **Limit the amount of material presented in the overall module and in each session.** In Module 1, we erred in having too many speakers, each attempting to cover too broad an area. Consequently, we purposefully limited the scope of Module 2 and had only one primary speaker. Ironically, some of the participants commented in the Module 2 assessments that they wanted more speakers. Nonetheless, we feel that overall, the dictum of "less is more" is appropriate, particularly for complex topics.

- **Allow for more interrogatory between speakers and participants.** We designed Module 2 to be flexible and allow for more participant discussion. Having a large number of guest participants can limit the time available for each participant to speak.

- **Each presentation should be tied to one reading that closely corresponds to the topic and should be provided in advance.** We provided three papers and one textbook in advance, each of which was closely tied to the topic. We found this to be an effective strategy to reinforce the topic addressed.

- **Prepare a single, bound module reader with all material, rather than individual photocopies.** With a narrower topic than Module 1, the advance readings provided sufficient material.

- **The learning objectives for each session should be clearly stated and evaluated.** The topic of regulatory reform is quite complex. As such, we structured the lectures in a way that broke the topic down, with 15-minute "mini lectures" followed by longer discussion. This allowed for more clear learning objectives.

- **Provide explicit guidelines to guest speakers, keynote speakers, and panel discussants so that they provide critical information; and ensure better coordination among the speakers so the topics they present do not overlap.** With more time to prepare for Module 2 than Module 1, and with fewer guest speakers, we were better able to prepare them and ensure complementary, rather than overlapping, presentations.

- **More time is needed for networking among the participants and for tailored mentoring.** We tried to balance the participants' needs for informal time to network with the need to ensure maximum return on the USAID investment required to host the participants for five working days.

The theme of the second module was regulatory reform within the water and wastewater sector. As countries in the region move toward increasingly independent providers of utility services, the question facing leaders in the next ten years will be the proper regulation of these providers. Participants were introduced to the concept of the economic regulator, an independent entity that ensures stakeholder interests in a monopoly situation. By the close of the module, participants understood the different models for regulation and could argue the appropriateness of each in relation to the situation in their countries.

Applying a lesson learned from Module 1 in Amman, ABRI purposefully limited the topic of the module to regulatory reform, with side sessions on leadership. The goal was for the participants to explore a topic in depth and have opportunities for group discussion, rather than multiple lectures on disparate topics.

The final agenda for Module 2 was as follows:

Sunday, December 14, 2008

9:00	Welcome and introductions – Samir Shawky Welcome: Peter Reiss, Director, Advancing the Blue Revolution Initiative
9:30	Keynote: "Challenges for the Future of Water Regulation in Egypt," the Honorable Mohammed El-Alfy, Assistant Minister for Housing and Urban Development and Executive Director, Egypt Water Regulatory Authority
10:00	Review of agenda, administration, logistics – Samir Shawky and Dan Rothberg

10:30 Roles and relationships in the water sector – John Sitton
11:30 Coffee break
11:45 What does economic regulation mean? – John Sitton
12:15 A short history of regulation – Colin Hannan
Attributes of a good regulator – John Sitton
The case of Palestine – Kamal Issa
13:30 Lunch (hotel)
14:30 Range of regulatory models – John Sitton
The case of Morocco – Mostafa Biad
United Kingdom – Colin Hannan
15:30 Coffee break
15:45 Independent from whom? – John Sitton
16:30 Group presentation 1: change management – Ashraf El-Abd and partners
17:00 Daily evaluation and close for the day – Samir Shawky
18:30 Group dinner, Nile boat cruise

Monday, December 15, 2008

9:00 Recap and agenda for the day –Samir Shawky
9:15 Group presentation 2: Decision support systems – Mostafa Biad and partners
9:45 The necessary legal framework – John Sitton
10:15 Enforcement and incentives ("No regulation without enforcement") – John Sitton
10:45 Coffee break
11:15 The regulatory process – John Sitton
12:15 Performance incentive schemes – Mark Clifton
13:00 Lunch
14:00 Improving regulatory design – John Sitton
15:00 Leadership 1: self- assessment leadership survey – Nevine Abdel Khalek
16:30 Group presentation 3: GIS – Mohammad Assal and partners
17:00 Daily evaluation and close for the day – Samir Shawky
18:30 Free bus to City Stars Mall (voluntary)

Tuesday, December 16, 2008

8:55 Recap and agenda for the day – Samir Shawky
9:00 Group presentation 4: GIS – Adla Khalaf and partners
9:30 Pricing utility services – John Sitton and Mohammad Abdul Wahab
Price control calculations – Mark Clifton
10:30 Coffee break
11:00 Data quality and confidence – Dr. Farag Samhan, EWRA
11:30 Tariff design issues – Sitton
12:00 Leadership 2: situational leadership – Nevine Abdel Khalek
13:00 Lunch
14:00 Connections between Future Water Leaders and the Arab Countries Water Utilities Association (ACWUA) – Peter Reiss
14:30 Explanation of debate topics and division of teams – Samir Shawky
15:00 Daily evaluation and close for the day – Samir Shawky
18:30 Free bus to Khan El Khalili (voluntary)

Wednesday, December 17, 2008

8:55 Recap and agenda for the day – Samir Shawky
9:00 Group presentation 5: water and energy – Ali Jadel and partners
9:30 Transitions to regulation – John Sitton

10:30 Coffee break
10:45 Panel discussion: EWRA, Egypt Electric Authority
12:00 Leadership 3: empowering others with a clear mission statement
13:30 Lunch
14:30 Debate group 1 – Samir Shawky
15:30 Relating regulation to the original goals of service provision – John Sitton
16:00 Coffee break
16:15 Debate group 2 – Samir Shawky
17:15 Distribution of final evaluations and close for the day – Samir Shawky

Thursday, December 18, 2008

8:55 Recap and agenda for the day – Samir Shawky
9:00 Debate group 3 – Samir Shawky
10:00 Coffee break
10:15 Debate group 4 – Samir Shawky
11:15 Regulation as only part of the solution – John Sitton
11:45 Collection of final evaluations – Samir Shawky
12:00 Preview of module three – Peter Reiss
12:30 Presentation of certificates
13:00 Lunch

At the close of Module 2, once again the participants' evaluation was mainly positive. The majority rated the workshop "excellent," with all others stating that the module was "very good" or "good." The majority of participants perceived more near-term value from the leadership training sessions and more long-term value from the regulatory reform sessions.

While the FWL course proceeded, however, ABRI had been less successful in finding an institutional partner. In 2009, ABRI staff conducted a desk top analysis of three types of training organizations: leadership training institutes, water training institutes and multi-disciplinary universities. ABRI completed the mapping exercise of more than 20 organizations in the Middle East and North Africa as well as in Europe and the United States of which 14 qualified for a more intensive evaluation. The second group was selected based on their core competency/credibility in leadership and/or water and sanitation training, as well as on their strategic fit against five key criteria: (a) target audience, (b) program offering, (c) affordability, (d) sustainability, and (e) scalability. Two organizations scored highly, namely LEAD International, a non-profit based in London, England, and the UNESCO-IHE Institute for Water Education, based in Delft, the Netherlands. ABRI staff met with representatives from both institutions and discussed partnership possibilities around the FWL program. While both organizations demonstrated considerable interest, ABRI staff also had reservations based on the small number of available staff at LEAD and the lack of a Middle East focus at UNESCO-IHE. Though initially not scoring as highly, regional training institutions, such as Morocco's Office National de l'Eau Potable and the newly created Arab Water Academy, housed at the International Center for Biosaline Agriculture (IBCA) in Abu Dhabi, United Arab Emirates, appeared to warrant future re-examination.

Nevertheless, the absence in 2009 of an institutional partner for the FWL program convinced ABRI to defer future rounds of the program. ABRI also conducted a searching evaluation of the FWL program and arrived at a number of conclusions pointing to some short comings in the initial FWL design:

- The curriculum was developed by independent consultants and did not lend itself to replication by institutions;
- Content was newly developed requiring more time and money rather than leveraging existing materials;
- Modules were developed independently of each other, creating stand alone short courses rather than an integrated program;
- Sub-contracting with the course content providers hindered strategic institutional partnership development; and
- Leadership training and adult instructional techniques were not systematically incorporated into all elements of the proposed curriculum.

Based on this evaluation, ABRI changed direction and changed its timetable to address these shortcomings. If funding is available in a future ABRI phase, the FWL program could be revised so that ABRI partners, with possibly other donors and leadership and water training institutions, create an integrated, cohesive program that:

- Prioritizes and integrates leadership, change management, and adult instructional techniques into the core curriculum;
- Is designed to foster institutional replication;
- Leverages existing methodologies and materials;
- Blends a curriculum of in-person and online skill development, including mentoring and a personal improvement plan that records a participant's leadership skills development activities for a defined period; and
- Is co-funded by strategic partners who incorporate the FWL program design into their menu of future course offerings.

ABRI believes that this revised approach would be less costly, enable curriculum replication, create a functioning partnership, and demonstrate a model that can attract additional co-investors from the donor and private sector communities.

Lessons Learned

- Mid-level leadership and change management training remains lacking in most water sector technical training programs in the Middle East and North Africa and yet it is of vital importance to the sector.
- ABRI's "mapping" exercises of existing Middle Eastern and selected global water training programs reveal substantial interest in developing leadership training expertise similar to the FWL model.

- While no existing training institutions provide a perfect fit for the FWL model, a number of regional institutions and donors would welcome a continuation of the dialogue and the opportunity to structure a future partnership along these lines.

- FWL course content should be developed jointly with the host institution so that they "own" the material and can replicate it as appropriate.

4.5 AFRICA BUREAU SUPPORT

Introduction

The 2008 Appropriations Act contained a hard earmark for the Africa Bureau to fulfill water and sanitation obligations under the 2005 Senator Paul Simon Water for the Poor Act. ABRI resources were available to USAID's Africa Water Team to assist with the production of such documents, designs, or approaches that might be called for or to create or support such training programs that might be used to achieve these new goals and directions.

USAID's Africa Water Team made extensive use of these ABRI resources, one of the few tools at its disposal, and was able to work with ABRI to test and launch a number of pioneering, innovative approaches to the water sector. While not all of these endeavors were successful and continued, a number of initiatives proved of particular importance and were later designated as ABRI stand alone activities, such as the USAID Programming Guide, the WASH trainings, the Water Operator Partnerships, and the Non-Revenue Water Handbook. These activities are now described individually in this report.

Another aspect of ABRI's assistance to the Africa Bureau was in the area of support for USAID's participation in major international water sector meetings, such as the World Water Forum and the Stockholm International Water Week. ABRI organized panels and speaking opportunities for USAID staff so that its new directions could receive wider international exposure. ABRI manned the USAID booth at these international gatherings as well. Finally, with the change of Administrations and appointment of a new foreign policy team, detailed high-level briefing materials were required both for the new USAID Administrator and Secretary of State. ABRI played a major role here again. This general ABRI support to the Africa Bureau's new directions proved, therefore, of particular importance to the success of the Agency and the ABRI program as a whole.

Approach

The Senator Paul Simon Water for the Poor Act of 2005 mandated the production of an annual water and sanitation sector report to be issued by the Department of State, coordinated by OES, with substantial input from USAID. In practice, USAID wrote an initial draft of the Report and then submitted it to State's OES for revision and final issuance. Although USAID had been preparing its own Annual Report to Congress on its prior year water sector expenditures, the analytical requirements of the Paul Simon Report far exceeded what had been existing standard practice. USAID's Water Team's Africa Group requested ABRI to draft background documents and analyze water sector data that could be used as the basis for the annual Paul Simon Reports in 2007, 2008, and 2009.

In 2007/2008 ABRI did extensive research and analytical work on elements for a USAID water sector strategy for Africa including initial priority country profiles and other donor activity and drafted substantial materials. Although none of this material was issued in final form, large

portions of it were re-worked into that year's Paul Simon Report. ABRI was involved in editing and laying out the final Paul Simon Reports for 2007 and 2008. ABRI continued to support USAID in the production of the 2009 Paul Simon Report. ABRI updated both the country profiles and donor reports and submitted those materials to USAID.

The earlier draft materials also pointed out the serious technical gaps in USAID's human resource base in critical priority Paul Simon countries in Africa. ABRI was then asked to assist the Africa Bureau in designing the first water sector training program for USAID staff stationed in Africa. Again ABRI prepared extensive background materials and suggested a training outline. Due to 2008 time constraints, USAID adopted an existing, more urban-focused training design and asked ABRI to retain a facilitator and handle all ground logistics. The course was over-subscribed and was held in 2008 in Tanzania. Evaluations were mixed; some participants, while acknowledging the great need for training in the water and sanitation sector, believed that there was insufficient attention to the water earmark and to the rural nature of Missions' existing water portfolios. As a result, ABRI worked with the Water Team to re-think a program of technical training.

In 2009, ABRI was asked to prepare additional background materials to be used in negotiations relating to the achievement of the water and sanitation targets under the Millennium Development Goals (MDGs). These materials were to be used in discussion with the members of the G8, the African Ministers' Council on Water (AMCOW), and other entities. Finally, in 2010, ABRI was instrumental in the preparation of an 80 page Water "Flip Book" that was used in briefing both the USAID Administrator and the Secretary of State. ABRI was informed that the Secretary expressed particular praise for the high quality and usefulness of the water flip book.

Achievements and Results

- ABRI was the only external resource available to assist USAID's Africa Bureau and the Department of State in their production of the annual Paul Simon Water for the Poor reports to Congress. These substantive reports, personally cleared by the Secretary of State, were the principal materials used by Congress to track accomplishments under the Simon Act.

- ABRI functioned as a type of incubator of new ideas or directions which could then, following field testing, be adopted by USAID Missions. This process can be seen in a number of ABRI activities, including: WASH Training, utility twinning, and emphasis on non revenue water programs.

- The research and analytical base ABRI established in the water sector in 2007/2008 solidified its reputation for expertise and contributed to USAID's 2009 request for ABRI to produce "The WASH Programming Guide.". These accomplishments in turn led USAID to request ABRI to produce the 80 page Flip Book to brief the Administrator and the Secretary of State.

- The lessons learned from the Tanzanian training experience led directly to the creation of the WASH Training course given in 2009, which were also supported by ABRI.

Lessons Learned

- ABRI proved of great value to USAID/Washington's Water Team, especially the Africa group, in providing wide-ranging, high quality "field support" in writing and researching

background notes and papers as appropriate and in providing editing, lay out, and printing services.

- In selected cases, ABRI provided similar field support to missions, such as working with USAID/Sudan to enable them to support the Water Operator Partnership (WOP) with Uganda and to prepare to incorporate the WOP initiative into their mission program portfolio.

8 PROGRAM MANAGEMENT

With the intent of being flexible and responsive to both USAID's needs and opportunities identified throughout project implementation, ABRI's management approach and structure were designed to be adaptive in nature, absorbing each new direction with ease. This flexibility was necessary to respond to the disparate priorities of ABRI's four funding sources (Bureau for the Middle East, Bureau for Africa, the Office of Middle East Programs, and USAID/Egypt), act as a source of field support to USAID, and take advantage of partnerships as they arose. Flexibility does not mean, however, that the project was loosely managed. On the contrary, such an approach necessitated strong financial, contractual, personnel, and technical management systems and structures to ensure the project's success. These two features of programmatic flexibility rooted in strong systems and structures served as the guiding principles of ABRI's program management.

FLEXIBILITY AND RESPONSIVENESS

Flexibility became ABRI's hallmark and manifested itself in multiple ways:

- When the project first began, the Chief of Party was located in DAI's home office in Bethesda, MD. At OMEP's request, the COP was relocated to Cairo, Egypt in early December 2007, making it his duty post. He established a field office in Cairo on the premises of Environmental Quality International (EQI), which provided a part-time program coordinator, half-time office manager, and part-time senior advisor to the program. In late 2008, the CTO directed the COP to relocate his base of operations back to DAI's headquarters to enable him to manage the increasing number of activities taking place across a broad geographic area and to serve clients both in Washington, D.C. and the Middle East.

- ABRI also saw changes in staffing in order to manage the project most appropriately. In light of the many technical, managerial, and administrative needs of the program following the relocation of the COP to Cairo, the Deputy Chief of Party role was shifted from Del McCluskey to Dan Rothberg. Mr. Rothberg was able to commit valuable time resources to ABRI, while bringing technical knowledge of the water sector to the project. ABRI maintained access to Mr. McCluskey's deep knowledge and experience through short-term technical assignments, which did not require as great a time commitment as that of the DCOP position. Later, when the COP returned to the U.S., the DCOP position was transitioned to Jeremy Hagger as a result of shifts in the roles and responsibilities within the program's management structure. At this time the COP resumed the role of hands-on program manager, directly overseeing contracting, subcontractor relations, and client management. The role of DCOP, therefore, became focused on providing program management for the increasingly complex component carried out for the Africa Bureau, while the COP focused on the component for the Middle East Bureau.

- During the first half of the program's life, the Africa Bureau played a marginal role, requesting a single activity in Uganda at the onset of implementation in 2007 and a mission-

oriented workshop in Tanzania. However, the Africa bureau came to play a much heightened role following a newly constituted technical team, led by Carl Mitchell. The renewed engagement dramatically changed ABRI's implementation focus. The new Africa team of five asked ABRI to (1) conduct three additional workshops for mission staff in water, sanitation, and hygiene, (2) develop a water and sanitation program design manual for mission staff, (3) provide analytical back-up for funding decisions to AFR missions, including water supply and sanitation profiles for many countries and a mapping of external investments in the sector in Africa by donors, foundations, and other entities, (4) develop a support program for the fledgling African Water Operator Partnership, and (5) support a November meeting in Senegal of the Infrastructure Consortium for Africa.

These new demands required a rethinking and reallocation of program resources. It meant the cessation of three activities that had been designed, but not yet begun: (1) Regional River Basin Management Workshop, (2) Water Valuation, and (3) Regulatory Reform. While each of these activities was interesting and might have stimulated change in the water sector, without access to the AFR funds, the project did not have sufficient resources to carry them out.

- The project was intended to respond to USAID's needs as they arose and effortlessly take advantage of new opportunities as they presented themselves. Accordingly, ABRI developed its workplans and activity scopes of work in close collaboration with the two Bureaus, OMEP, and missions and often added new activities mid-year when requested by USAID. For instance, though not specifically elaborated in the project workplan, USAID and the Department of State requested ABRI's assistance to present the current and future global water situation, the United States government's response, and opportunities for action to Secretary of State Hilary Clinton, and USAID Administrator Dr. Rajiv Shah. The resulting water and sanitation "flip book" was well received and later referenced by Secretary Clinton in a speech commemorating World Water Day. With a strong working relationship and an adaptable project structure, USAID was able to efficiently draw upon ABRI's resources and technical acumen whenever needed.

STRONG PROGRAM MANAGEMENT

Given the numerous activities, the changeable nature of our operating context, multiple funding sources, and need for flexibility, ABRI instituted strong program management systems in order to adhere to USAID regulations and ensure the success of the program.

- From the project's inception, ABRI utilized DAI's Technical and Administrative Management Information System (TAMIS) to manage this complex project. Over the three year period of performance, ABRI mobilized over 15 independent consultants, managed 10 subcontractors – many with multiple task orders falling under their subcontract agreements, and 13 fixed price purchase orders to carry-out a range of program activities. DAI developed TAMIS as a tool to ensure that workplan management and project administration did not become burdensome and take the focus away from projects' critical technical activities. The ABRI TAMIS focuses on the tasks and activities in the project's annual workplan while specifying and tracking timing and resource allocation, and compiling, sorting, and distributing information pertinent to each task, such as technical assistance, training programs, publications, and other outputs produced in the performance of each workplan activity.

- The ABRI team consisted of DAI staff, US and locally-based subcontractors, and independent consultants. DAI's staff included a COP, DCOP, partnerships development

specialist, and project coordinator, each with a specific and clearly defined role on the project. In addition, the project team was supported by DAI's contract, finance, and project management groups, who met on weekly and quarterly bases and used customized tracking systems to ensure that all team members met their internally established deliverables and responsibilities.

With regard to the larger ABRI team, the COP, DCOP, partnership development specialist, and project coordinator were in regular contact with subcontractors and consultants to monitor the quality of their work, respond to challenges as they arose, and manage contractual obligations. Strong and involved subcontractors were a key aspect of the project's management system. For example, within two weeks of signing of the contract, ABRI management convened a regional start-up meeting in Cairo that included key partners from Egypt, Jordan, and Lebanon. The following year, the principal members of the ABRI team gathered in Cairo for a team planning meeting facilitated by TRG.

ANNEXES

A. ABRI PUBLICATIONS

ABRI Final Report. November 2010.

Assessing Water Resources Sustainability in the Hadhramout in Yemen. November 2010.

Collaborative Planning and Knowledge Development in the Tigris-Euphrates Region. November 2010.

Middle East and North Africa Water Center Network (MENA WCN). Assessment and Design Report. November 2010.

Programming Guidelines for Water, Sanitation, and Hygiene. A Design Manual for USAID Staff. August 2010.

2010 Senator Paul Simon Water for the Poor Act Report to Congress. June 2010.

The Manager's Non-Revenue Water Handbook for Africa. A Guide to Understanding Water Losses. March 2010.

L'Eau Non Comptabilsée en Afrique – Manuel du Directeur. Mars 2010.

Projet Pilot: Réutilisation des Eaux Usées Traitées en Agriculture à Meknès, Maroc. Rapport 1: Diagnostic et Analyse de la Situation Actuelle: Janvier/Avril, 2009.

Pilot Project : Reuse of Treated Wastewater in Agriculture in Meknès, Morocco. Report 2 : Soil, Land Use and Irrigation Network Mapping : January/April 2009.

Projet Pilot: Réutilisation des Eaux Usées Traitées en Agriculture à Meknès, Maroc. Rapport 3 : Design du System d'irrigation et Cadre Institutionnel : Jan/May 2009.

Projet Pilot: Réutilisation des Eaux Usées Traitées en Agriculture à Meknès, Maroc. Rapport 4 : Guidelines pour la Réutilisation des Eaux Usées Traitées : Jan/May 2009.

ABRI Quarterly Report: April – June, 2009

Training Report, Future Water Leaders Module 2. January 2009.

Training Report, Future Water Leaders Module 1. October 2008.

ABRI Quarterly Report 4: April – June 2008. August 2008

ABRI Year Two Work Plan. July 2008

Mapping of Alliance and Partnership Opportunities and Implementation Plan. June 2008

Water User Associations in the Middle East: Drivers for Commercialization and Improved Water Management? June 2008

Quarterly Report 3: January – March 2008. April 2008.

Future Water Leaders Program Announcement and Application. April 2008.

ABRI Co-investment Strategy. March 2008.

Water User Associations in the Middle East: Preliminary Findings and Next Steps. March 2008.

ABRI Quarterly Report 2: October – December 2007. January 2008.

Assessing Transboundary and Domestic Aquifer Opportunities for Joint Action in Yemen, Jordan, and Saudi Arabia. January 2008.

ABRI Quarterly Report 1: May – September 2007. November 2007.

Bujagali Dam Environmental Mitigation Assessment. August 2007.

ABRI Year One Work Plan. June 2007.

B. MAJOR PARTNERS AND CONTACTS

Bold designates organizations with whom meetings, conversations or email exchanges occurred.

Water Partnerships and Associations

- **ACWUA: Khaldon Khashman, Executive Director**
- **ACWUA: Nadia Abdou, Alexandria Water Company, Chairperson**
- AIDIS: Carlos Alberto Rosito, President, Inter-American Association of Sanitary and Environmental Engineering, Brasil
- Amanz Abantu – Oliver Ive, Managing Director
- **AquaFed: Thomas van Waeyenberge, Brussels Liaison Officer**
- **AquaFed: Jack Moss (on secondment from Suez)**
- EWP: Friedrich Barth, Vice Chairman, European Water Partnership
- EWP: Agnes Vaillier, Office Manager, European Water Partnership
- **EWP: James Dorsey, Board Member, European Water Partnership**
- EUREAU: Durk Krol, General Secretary, European Federation of National Water and Sanitation Services Associations
- FWP: Francois-Xavier Imbert, Executive Director, French Water Partnership
- GWA: Joke Muylwijk, Executive Director; Esther de Jong, Senior Program Officer, Chrisje van Schoot, Sr Program Manager, Eva Rathgeber, Steering Committee Member, Sara Ahmed, Chairperson, Dr Kuntala Lahiri Dutt, Sterming Committee Member - Gender & Water Alliance
- GWP: Aurelie Vitry, Network Support Officer, Global Water Partnership
- **IWA: Paul Reiter, Executive Director, International Water Association**
- **IWA: Darren Saywell, Development Director**
- **IWA - Steen Bjerggard, Water Operators Partnerships Coordinator**
- JWF: Taeko Yokota, Chief Programme Officer, Japan Water Forum – Secretariat of the Asia-Pacific Water Forum (APFW) and the Northern Water Network (NoWNET)
- **NWP: Jeroen J. van der Sommen, Managing Director, Netherlands Water Partnership**
- **ONEP: Samir Bensaid, Director General, International Institute for Water & Sanitation**
- **RAND Water: Prof. Hamanth Kasan, Southern Africa Regional Vice President, AfWA & General Manager, Scientific Services**
- Vewin: Nicole Zantkuijl, Dutch Water Utility Association
- **WEF: Rebecca F. West, President, Water Environment Federation**
- WEF: Paul Freedman, President Elect, Water Environment Federation
- **WEF: Ken Maynard, Director International Programs and Business Development**
- **WfWP: Dr Alice Bouman-Dentener, President, Women for Water Partnership**
- **WfWP: Lesha Witmer, Finance Director, Women for Water Partnership**
- **WWC: Ger Bergkamp, Director General, World Water Council**
- WWC: Danielle Gaillard-Picher, Forum Coordinator, World Water Council

Institutes

- CIWEM: Paul Horton, Director of International Development, The Chartered Institution of Water and
- Environmental Management
- DIE: Tanja Buhles, Research Fellow, German Development Institute

- IRC: Catarina Fonseca, Senior Program Officer, International Water & Sanitation Center
- IRC: Christelle Pezon, International Water & Sanitation Center
- **OECD: Monica Scatasta, OECD Water Programme Coordinator** (as of 2009, with the EIB)
- **SIWI: Jakob Granit, Project Director, Stockholm International Water Institute**
- SIWI: Lovisa Selander, Communications Officer
- SIWI: Johan Holmberg, Economist, EUWI-Finance Working Group (until 2009)
- SIWI: Rebecca Lofgren, Project Officer, Stockholm International Water Institute
- WISA: Junior Potloane, Chief Executive, Water Institute of South Africa

Universities

- University of Twente: Dr. Arjen Hoekstra, Professor Multidisciplinary Water Management, Faculty of Engineering Technology / Water Engineering and Management
- CEPT: Dr. Meera Mehta, Professor Emeritus, University School Planning, Centre for Environmental Planning & Technology
- Alexandria University, Faculty of Agriculture: Dr. Sami El-Rakshy, Faculty Member at Fruit Crops Department, Egypt
- Kyoto University: Dr Saburo Matsui, Emeritus Professor
- Wilfrid Laurier University: Michele-Lee Moore, Doctoral Candidate Global Governance, Canada

United Nations

- UNEP: Halifa Drammeh
- UNEP Finance Initiative: Remco Fischer, Project Manager
- **UN Global Compact: Gavin Power, Director, CEO Water Mandate**
- UN Global Compact: Oliver Johner, Communication on Progress Analyst
- **UN CapNet: Paul Taylor, Director**
- **UNDP: Andrew Hudson, Principal Technical Advisor, International Waters GEF**
- **UNDP: Mirey Atallah, Regional Technical Advisor, Environment Finance Group for Arab States**
- **UNDP: Susanne Schmidt, Water Governance Specialist**
- **UNDP: Joakim Harlin, Senior Water Resources Advisor, UN-Water Task Force**
- **UN Habitat: Bert Diphoorn, GWOPs Director**
- **UN Habitat: Faraj el-Awar, GWOPs Coordinator**
- UN Habitat: Andre Dzikus, Chief, Water and Sanitation Section II, Water, Sanitation and Infrastructure Branch
- **UN Habitat: Graham Alabaster, Chief Section I, Water, Sanitation & Infrastructure Branch**
- UN Habitat: Rose Osinde, Human Settlements Officer, Urban Environment Section
- **UNU: Corinne Schuster-Wallace, Programme officer Water-Health Programme, UN University International Network on Water, Environment and Health**
- **UNU: Walid Saleh, Regional Coordinator for the Middle East and North Africa, UN University, Dubai**
- UNESCO - Toshihiro Sonoda, Program Specialist, Division of Water Sciences, Natural Sciences Sector
- UNESCO-IHE: Dr. Maher Abu-Madi, Water and Environmental Engineering and Economics, POWER program (Partnership for Water Education and Research), Palestine
- UNICEF: Evariste Kouassi-Komlan, WES Manager, Madagascar (formerly with CREPA)

Donors and Development Banks

- AfDB: Ms. Malinne Blomberg, Financial Management Specialist, African Water Facility, African Development Bank
- ADB: David S. McCauley, Principal Climate Change Specialist, Asian Development Bank
- BRG: Dr. Ariane Borgstedt, Hydrogeologist/Project Coordinator, Groundwater Resources Management, (German) Federal Institute for Geosciences and Natural Resources
- DFID: Helen Richards, Governance Adviser, Water and Sanitation Policy Team
- **EIB: Jose Tomas Frade, Deputy Director, Projects Directorate, Head of Water and Environmental Protection Division, European Investment Bank**
- **EIB: Monica Scatasta, Senior Economist in the Water and Environmental Protection Division**
- **EUWI: Johan Holmberg, Chair, Finance Working Group of European Union Water Initiative**
- **EC: Murray Biedler, Program Manager Water Facility Unit, European Commission**
- EC: Maria Vink, Water Policy Advisor, European Commission
- Finnish Embassy: Martha Solomon, Water Advisor, Embassy of Finland in Addis Adaba, Ethiopia
- **Finnish Embassy: Mr. Antti Inkinen, Development Cooperation Advisor, Embassy of Finland in Addis Ababa, Ethiopia**
- French Government: Veronique Verdeil, Minsitry of Foreign and European Affairs, French Government
- **GTZ: Dr. Franz-Josef Batz, Team Leader, International Water Policy**
- **GTZ: Dr. Philipp Magiera, Planning Officer Water, Energy, Transport**
- **GTZ: Dr. Andreas Kuck, Head of Water Department/Portfolio**
- GTZ: Dr. Helga Fink, Water Supply and Sanitation Coordinator
- GTZ: Nina Odenwaelder, Policy Advisor International Water Policy and Infrastructure
- IFC: Bastiaan Mohrmann, Principal Investment Officer, SME Global Linkages Unit, International Finance Corporation
- NIB: Husamuddin Ahmadzai, Special Adviser Environment and Technology, Nordic Investment Bank
- SA: Fred van Zyl, Director Water Services Planning & Information, Republic of South Africa
- **WSP: Kameel Virjee, Financial Specialist, Water and Sanitation Program (Nairobi)**
- WB: Diego Rodriguez, Senior Economist, Energy and Water Department, World Bank

<u>Microfinance Institutions and MFI Investors</u>

- Accion: Monica Brand, Principal Director, Frontier Investments
- **BRAC: Dr. Babar Kabir, Director, WASH and Disaster, Environment & Climate Change Programme**
- BRAC: Tanzeba Ambereen Huq, Program Manager, Disaster, Environment & Climate Change Program
- **CARE: Sybil Chidiac, Economic Development Programs**
- **CHF International: Erin Mote, Manager Resource Development**
- **CHF International: Elissa McCarter, Director of the Office of Development Finance**
- **CREPA : Halidou Koanda, Water/Sanitation/Environment Research Coordinator, Centre Regional pour l'Eau Potable et l'Assainissement a faible Cout**
- **Development Workshop: Allan Cain, Director**
- **Development Workshop: Glenn Paje, Canada**
- Institute of Microfinance: Dr. Mosleh Uddin Sadeque, Director, Bangladesh
- **Triple Jump: Mark van Doesburgh, Director**
- **Triple Jump: Anthony Randazzo, Senior Investment Officer**
- **Water.org: Gary White, Executive Director**
- **Water.org: Rich Thorsten, Director of International Programs**

- **Water.org: April Rinne, Director, WaterCredit**
- **SEEP Network: William Tucker, Executive Director**
- **SEEP Network: Laura Meissner, Senior Program Manager**
- **Finnish Embassy/Addis: Antti Inkinen, Advisor (Water)**
- **Gates Foundation: Rachel Cardone, Program Officer WASH**
- **WASTE: Valentin Post, Senior Advisor**
- **Opportunity International: April DuBois, VP International Business Development**
- **Opportunity International: Estelle Berger, Director Knowledge Management**
- **Scotiabank: Miguel Arce Tellez, General Manager of Individual Accounts**
- ArcFinance: Ellen Morris, Director/Co-Founder
- ArcFinance: Nicola Armacost, Director/Co-Founder
- AKDN: Greg Long, Aga Khan Development Network, Communication and External Relations Officer
- AKDN: Trushna Patel, Program Officer
- Microvestfund: David Wedick, Business Development Officer
- MercyCorps: Shadi Bushnaq,
- MercyCorps: Gretchen Ansorge, Regional Program Manager
- Shorebank International: Lauren Moser Counts, Vice President

NGOs

- CAD Mali: Dounantie Dao, Executive Director, African Alternatives Coalition Debt and Development
- CGI: Lia Marshall, John Gardner Fellow UCLA-Berkeley, Clinton Global Initiative
- EnterpriseWorks/VITA: Don Feil, President & CEO
- **GWC: Paul Faeth, Executive Director, Global Water Challenge (Washington DC)**
- GWC: Lyn Soudien, Director of Development and Strategic Partnerships (Wash DC)
- Good Stuff International: Derk Kuiper, Program Coordinator Water Footprint Working Group Project
- IUCN – Julia Marton-Lefevre, General Director, Switzerland
- IUCN – Ganesh Panagre, Coordinator, Regional Water and Wetlands Programme, Asia
- Oxfam America: Gawain Kripke, Director of Policy & Research
- PSI – Sally Cowal, Senior Vice President, Population Services International
- Plan International: Mr. Amsalu Negussie, Regional Water and Sanitation Advisor, Region of Eastern & Southern Africa (S. Africa)
- pS-Eau: Christophe Le Jalle, Executive Director
- RAED: Dr. Emad Adly, Arab Network for Environment and Development, Cairo
- TNC: Jonathan Kaledin, State Counsel (member of CEO Water Mandate), The Nature Conservancy
- TNC: Eloise Kendy, Director, Environmental Flows Program, Global Freshwater Team, The Nature Conservancy
- WET: John E. Etgen, Senior Vice President, Water Education for Teachers
- Water for People: Ned Breslin, Director International Programs
- Water Stewardship Initiative – Michael Spencer, (former CEO of FSC Australia, member of CEO Water Mandate)
- Water Stewardship Initiative/ One World Standards: Matthew Wenban-Smith, Director
- **WSUP: Sam Parker, Executive Director, Water & Sanitation for the Urban Poor**
- WSUP: Kariuki Mugo, Project Manager
- WSUP: Will Day, Chairman, Water & Sanitation for the Urban Poor, London
- WWF-UK: Stuart Orr, Freshwater Policy Officer, World Wildlife Foundation
- WWF: Ceren Ayas, (part of ETIC program in Turkey)

- WWF: Philip Leonard, HSBC Program Manager, World Wildlife Fund, London
- NBCBN: Dr. Sherif M El-Sayed, Network Manager, Nile Basin Capacity Building Network for River Engineering
- Earthwatch – Peter Cookey, Member of WSSCC Steering Committee, Nigeria*
- EWRI – Dale Jacobson, President, EWRI of ACSE*
- Ingrac – Dr Neno Kukuric, Deputy Head, International Groundwater Resources Assessment Centre, Utrech, NL*
- Rotterdam Climate Initiative – Arnoud Molenaar, Program Manager, NL*
- GWP – Simon Thuo, Regional Coordinator East Africa, Global Water Partnership
- NWP – Jeroen van der Sommen, Managing Director, Netherlands Water Partnership
- WASTE – Valentin Post, Senior Advisor, WASTE
- WIN – Ms Birke Otto, Communications & Research, Water Integrity Network
- WIN – Erik Nielsen, Deputy Programme Manager, Water Integrity Network
- WSUP – Paul Gunstensen, Water and Sanitation for the Urban Poor
- WfWP – Lesha Witmer, Treasurer, Women for Water Partnership (already have card)
- BRAC - Babar Kabir, Director, Water, Sanitation & Hygiene Program (already have card)
- IUCN – Ganesh Panagre, Coordinator, Regional Water and Wetlands Programme, Asia (already have card)
- AWS – Michael Spencer, Executive Director, Alliance for Water Stewardship
- AWS – Karin Krchnak, Senior Advisor/International Water Policy (and TNC), Alliance for Water Stewardship
- One World Standard – Matthew Wenban-Smith, Director (Water Stewardship Initiative member)* Oxford, UK (already have card)
- TNC – Jonathan Kaledin, State Counsel (member of CEO Water Mandate) (already have card), The Nature Conservancy
- TNC – Peter Hage, Director of Resources, Technology & Information Systems, The Nature Conservancy
- TNC – Sarah Davidson, Marine & Freshwater Policy Associate, The Nature Conservancy
- WWF International – Stuart Orr, Freshwater Manager, World Wildlife Fund
- WWF Beijing – Ma Choade, Freshwater Programme Director, World Wildlife Fund
- WfP – Ned Breslin, Chief Executive Officer, Water for People
- WfP – Sarah Bramley, Regional Manager, Africa, Water for People
- Mio-ECSDE – Michael Scoullos, Chairman, Mediterranean Information Office for Environment, Culture and Sustainable Development
- ICLEI – Margaret Pageler, Executive Committee, Local Governments for Sustainability
- Fair Water Africa – Paul van Beers, WatSan Development Specialist, FairWater Foundation
- ***MEYI – Ehaab D Abdou, Advisor, Middle East Youth Initiative, Wolfensohn Center for Development, Global Economy and Development, Brookings Institute (Ashoka Fellow)***
- Aspen Network of Development Entrepreneurs – Randall Kempner, Executive Director
- Social Enterprise Alliance – Kris Prendergast, President & CEO
- Social Impact – Charly Kleissner, Co-Founder
- World Resources Institute – Ray Cheung, China Manager, New Ventures/Markets & Enterprise Program
- World Resources Institute – Francisco Noguera, Research Analyst & Co-Managing Editor, NextBillion.net
- KIVA – Brooke Estin, Customer Service & Public Relations
- NetHope – Bill Brindley, Chief Executive Officer
- IREX – Robert Cronin, Director, Civil society Division
- **WSSCC: Jon Lane, Executive Director, Water Supply & Sanitation Collaborative Council**

- **WaterAid America: Patricia Dandonoli, President & CEO**
- **BORDA: Gert Kreutzer, Project Management, Bremen Overseas Research and Development Association (Bremen)**
- BORDA: Frank Fladerer, Deputy Regional Coordinator South-East Asia (Indonesia)
- EarthWater Global: Nick Rutherfurd, Partner, EarthWater Global Megawatershed Development (NY)
- Waste: Arjan Sleurink, Financial Advisor (Gouda, NL)

Private Sector Companies

- **SNS Asset Management: Kajetan Hetzer, Analyst Development Investments (NL)**
- JPMorgan* : Claudia Kruse, Environmental Social Governance, (London)
- **Coca-Cola Company*: Dr. Kadri Ozen, Corporate Communications Director, Eurasia & Africa Group (Istanbul)**
- **Borealis*: Sylvain Lhote, Director EU Affairs, Water for the World programme manager (Belgium)**
- SABMiller*: Andy Wales, Head of Sustainable Development (Surrey, UK)
- Dow Chemical Company*: Scott Noesen, Director Sustainability and Business Integration (Midland, MI)
- Nestle S.A. *: John Bee, Communications Manager (Vevey, CH)
- **Hindustan Construction Co*: Mangesh Gupte*, Deputy General Manager, CSR-UN Water Mandate (Mumbai)**
- **Hindustan Construction Co*: Niyati Sareen, Deputy General Manager, CSR (Mumbai)**
- Diageo*: Will Peskett*, Head of Corporate Responsibility (London)
- Diageo*: Gareth Collins*, Environmental Manager International Beer Supply (Dublin)
- **Diageo*: Nicole Lovett, CSR (London)**
- **Liqum*: Minna LeVine, Principal (Atlanta)**
- Unilever*: John Temple, Vitality Director (Wirral, UK)
- **AfricaPractice: Camilla Flatt, Consultant (London)**
- Suez: Jacques Labre, VP Relations with Institutions, Suez Environment (Paris)
- Salans: Martin S. Baker, Attorney at Law (NY)
- ITT – Bjorn von Euler, Director of Corporate Philanthropy, White Plans, NY*
- Netafim – Ms. Aliza Tamir, VP of Corporate Marketing, Tel Aviv, Israel*
- IBM – Ian Abbott-Donnelly, European CTO, Big Green Innovations (UK)*
- Syngenta – Dr Juan Gonzalez-Valero, Head of Corporate Responsibility (Switzerland)*
- Syngenta – Peleg Chevion, Business Ventures Manager (Switzerland)*
- Pepsico Foundation – Claire Brown Lyons, Manager, Global Grant Portfolios, Purchase NY*
- Hennes & Mauritz – Henrik Lampa, SEC Department (Stockholm, Sweden)*
- 6 News – Laura Wells, Anchor, Istanbul, Turkey*
- Acumen Fund – Marc Manara, Portfolio Manager
- Gates Foundation – Rachel Cardone, Program Officer (already have contact infos)
- Skoll Foundation – David Rothschild, Program Officer
- Triple Jump – Mark van Doesburgh, Director
- ITT – Bjorn von Euler, Director of Corporate Philanthropy, White Plans, NY (already have card)
- Syngenta – Dr Juan Gonzalez-Valero, Head of Corporate Responsibility (Switzerland)
- Syngenta – Peleg Chevion, Business Ventures Manager (Switzerland)
- Dole Food Company – Roberto Vega, CSR Manager
- Levi Strauss – Anna Walker, Senior Manager, Worldwide Government Affairs and Public Policy
- McKinsey & Company – Dr. Martin Stuchtey, Principal

- SAB Miller – Andy Wales, Head of Sustainable Development
- Sasol – Martin Ginster, Environmental Advisor: Water and Cleaner Production
- World Economic Forum – Valerie Aillaud, Associate Director, partnership
- World Economic Forum – Melanie Duval, Team Coordinator, Environmental Initiatives

Social Venture Funds

- ***Skoll Foundation – David Rothschild, Program Officer, Program & Impact***
- ***Skoll Foundation – Jill K. Finlayson, Web Marketing Manager, Social Edge***
- Equilibrium Capital Group – Brooke Randall
- IGNIA Partners, LLC (Mexico/C. American venture fund) – Susie Lee
- New Ventures Mexico – Rodrigo Villar Esquivel, Director General
- ***Invoking the Pause – Anne Fitzgerald, Family Foundation***
- Labrador Ventures – Sean Foote

Social Enterprises

- ***Driptech – Peter Frykman, Founder (low cost drip technology, prototype exists but production is not yet in gear, company is in Series A fundraising mode)***
- E+Co – Anne Murray, Development Officer
- Agora Partnerships – Lis Sessler, Director of Business Development
- Indigenous Designs – Scott Leonard, COO
- World of Good – Ella Silverman, Executive Director
- Wall Street Without Walls – Andreas Prasetiya, Senior Project Associate
- PharmaSecure – Nathan Sigworth, Co-Founder/CFO
- SVT Group – Sara Olsen, Founding Partner (social impact measurements)
- Drucker in Social Business – Houghton Wan, Business Development Coach, Social Entrepreneurship (Hong Kong)
- Beijing Prism Educational Consulting Co Ltd – Richard Roque, Executive Director (Hong Kong, Beijing)
- Green Retirement Plans, Inc – Timothy Lee, President
- International College of American Nursing (ICAN) – Shabbir Nomanbhoy, Founder & CEO
- Open Minds – Rose Sarita Shuman, Founder (hotline/call center concept for non-cell phone coverage areas)
- Nuance Intelligence/The Business Catapult – Greg Berry, Founder (technology tools for connecting)
- Social Actions – Peter Deitz, Founder/Executive Director (technology tools for connecting)
- Idea-Encore Network – Scott Bechtler-Levin, President (technology tools for connecting)
- RealNetworks Inc – Elizabeth Coppinger, Vice President, Video Services
- SpectroSpace – Sonia Sousa, Founder
- IDEO – Sally Madsen, Design for Social Impact (RIPPLE EFFECT project manager)
    - https://client.idea.com/rippleeffect/
- IDEO – Jocelyn Wyatt, Social Impact Lead
- Collective Invention – Fiona Hovenden, Partner, (ethnographer)
- Blue Earth Network – Udaiyan Jatar, Founder
- AfricaSIF.org – Graham Sinclair, Founder (online social investor fund for Africa) – no card

Consultants

- AECOM: Duane Kissick, Vice Chair, AECOM International Developent (Washington DC)
- AECOM: Niels van Dijk, ECO-Asia Water and Sanitation Team Leader (Bangkok)
- James G. Workman, Author "Heart of Dryness" (participant in Water Leaders Academy meeting)

- CDM – Paul R Brown, Executive Vice President, Global Market Development, Camp Dresser & McKee Inc
- RTI – Alan Wyatt, Senior Water and Sanitation Specialist International Development Group
- Sustainable Alchemy – Kathy Lombardi, Principal
- Texas A&M University – Andrew Schneck, (Focusing on dry toilets)
- Chemonics – Jamey Butcher, Senior Vice President, Europe and Eurasia
- ORGUT – Ken Levicki, Marketing Officer
- Tremolet Consulting – Sophie Tremolet, Economist and Institutional Specialist
- Water Research Commission – Piers Cross, Member of the Board
- Manfred Manz – Water Policy and Water Governance (does a lot or work with GTZ)

Governments

- T.M. Vijay Bhaskar, Joint Secretary, Government of India, Ministry of Rural Deelopment, Dept of Drinking Water Supply (New Dehli)
- DSI Turkey: Huseyin Gundogdu, Agriculture Engineer (Ankara)
- DSI – Dr. Sevgi Donma, Turkey
- Department of Finance - Jeremias N, Paul, Jr., Undersecretary (Manila)

U.S. Government-funded Programs

- AECOM - Paul Violette, ECO-Asia, COP, Bangkok
- AECOM - Niels van Dijk, ECO-Asia Water & Sanitation Team Leader, Bangkok
- ICARDA - Scott Christiansen, Resource Mobilization Advisor, Aleppo, Syria*
- AED - Julia Rosembaum, Deputy Director, Hygiene Improvement Project, (HIP)
- ETIC - Faisal Rifai, Chair, Lebanon
- ETIC - Lina Sergie Atassi, Board Member
- ETIC Partner - Richard L. Wood, ETIC Advisor, Associate Professor of Sociology, University of New Mexico, Albuquerque
- ETIC Partner - Kurt Benedict, GIS expert, University of New Mexico