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USAID/Jordan Water Conservation Activity (WCA) Request for Information 278-2015

Ladies and Gentlemen:

The United States Agency for International Development (USAID) Mission in Jordan is interested in gauging the potential partners' understanding of the attached Water Conservation Activity (WCA) and the requirements. The purpose of this Request for Information (RFI) therefore, is to determine if there is sufficient understanding of WCA, or if a Pre-Application Conference would be beneficial.

Your response should be YES, the Pre-Application Conference would be beneficial, or NO, the Pre-Application Conference would not be beneficial. If YES, then please provide a very brief explanation as to why. The explanation should be no more than 300 words.

All responses must be received in USAID no later than September 29, 2015 at 4:30 Jordan time. Please respond by email only to bdiah@usaid.gov. Telephone inquiries will not be accepted. The Mission will not directly respond to inquiries regarding this RFI, but may consider responses in the final preparation of the NFO.

This is not a notification for funding opportunity. An actual notification will be issued in the near future. The request for information in no way obligates USAID to issue a notification for funding opportunity, nor does it commit the U.S. Government to pay any cost incurred in responding to this request for information.

TABLE OF CONTENTS	3
ACTIVITY DESCRIPTION.....	ERROR! BOOKMARK NOT DEFINED.
1. INTRODUCTION	ERROR! BOOKMARK NOT DEFINED.
2. BACKGROUND	5
2.1 Statement of Challenges and Opportunities.....	5
2.2. Relationship to the USAID Strategy and US Foreign Policy Objectives in Jordan.....	7
2.3 Relationship to Government of Jordan and Other Jordanian Priorities	8
2.4 Complementarity with Other Donor Efforts	8
3 ACTIVITY OVERVIEW.....	9
3.1 Activity Purpose, Sub-purposes and Approach	9
3.2 Activity Outcomes	11
3.2.1 Outcome 1: Water-saving technologies and behavior change adopted	11
3.2.2 Outcome 2: Sustainable aquifer recharge and soil water storage improved.....	12
3.2.3 Outcome 3: Institutions strengthened to promote water-saving technologies	13
4 CROSS-CUTTING STRATEGY	16
4.1 All Mission Development Objectives Must Contribute to Four Cross-Cutting Results.....	16
4.1.1 Gender	16
4.1.2 Youth.....	17
4.1.3 Stability and Conflict Prevention	17
5 MONITORING AND EVALUATION (M&E) PLAN AND LEARNING APPROACH	18
5.1 M&E Overview.....	18
6 SUSTAINABILITY	19
6.1 Sustainability Analysis Overview.....	19

WCA Acronym List

ADS	Automated Directives System
BRP	Badia Restoration Program (MoENV)
CBIWDM Project)	Community Based Initiative for Water Demand Management (USAID/Jordan Project)
CBO	Community Based Organization
DCA	Development Credit Authority
DO	Development Objective
EDE	Office of Economic Development and Energy
ESCB	Energy Sector Capacity Building Project (USAID/Jordan Project)
G2G	Government to Government (GOJ – USG)
GDP	Gross Domestic Product
GIZ	<i>Gesellschaft für Internationale Zusammenarbeit</i> (Germany)
GOJ	Government of Jordan
Ha	Hectare
HWF	Highlands Water Forum
IR	Intermediate Result
ISSP	Institutional Support and Strengthening Project (USAID/Jordan Project)
JCP	Jordan Competitiveness Program (USAID/Jordan Project)
JLGF	Jordan Loan Guarantee Fund (USAID/Jordan Project)
JV	Jordan Valley
JVA	Jordan Valley Authority
JVWF	Jordan Valley Water Forum
LENS	Local Enterprise Support Project (USAID/Jordan Project)
M&E	Monitoring and Evaluation
MCM	Million Cubic Meters
MENA	Middle East and North Africa
MOA	Ministry of Agriculture
MoENV	Ministry of Environment
MOPIC	Ministry of Planning and International Cooperation
MoSD	Ministry of Social Development
MWI	Ministry of Water and Irrigation
MWSI	Middle East Water Security Initiative
NCARE	National Center for Agricultural Research and Extension
NGO	Non-Governmental Organization
NWC	Network of Water Centers of Excellence (USAID/Middle East Bureau Project)
RCs	Rangeland Cooperatives
TVE	Technical and Vocational Education
UNCC	United Nations Compensation Commission
USAID	United States Agency for International Development
USFS	U.S. Forest Service
USG	United States Government
WCA	Water Conservation Activity
WLI	Water and Livelihoods Initiative (ICARDA)
WUA	Water User Association

SECTION I – ACTIVITY DESCRIPTION

1. INTRODUCTION

The objective of the Water Conservation Activity (WCA) is to save water in Jordan and create a national movement for water conservation. In the longer term, the WCA is expected to significantly decrease unsustainable over-drafting of Highland aquifers; augment water available in households; increase capture of water currently lost through evaporation or run-off; reuse wastewater, and shift cropping patterns from low value / high water demand to water efficient / high value crops.

Chronic water scarcity is expected to worsen in the years to come. Groundwater overexploitation has led to declining water tables, drying up of springs, and deteriorating water quality; threatening the economic prosperity and quality of life for millions of Jordanians. The situation has been exacerbated in recent years by a rapidly growing population and the influx of hundreds of thousands of Syrian refugees.

Costly desalination, deeper drilling of existing wells and the transport of water from remote non-renewable sources have all been implemented extensively in Jordan over the last ten years. Conservation needs to occur among the groups that use water most inefficiently and least profitably, on a scale that will meaningfully conserve the greatest volume of water.

The WCA will be implemented through a Cooperative Agreement that will be complemented by an Inter-Agency Agreement between USAID and the U.S. Forest Service (USFS), funded outside of the Cooperative Agreement, to assist with shrub seedling and transplantation techniques. USFS will cooperate with a major effort on water conservation – the \$160 million Government of Jordan Badia Restoration Program (GOJ-BRP) to help restore hydrological processes.

Interventions will be progressively scaled up, sending a clear message to the public that solutions are available to better manage the scarce supply of water in Jordan. In short, water conservation is vital to enhancing efficiency and is much easier to achieve at a reasonable cost to the nation compared to solutions on the supply side. Unquestionably, the GOJ has done a good job in creating new supplies of water but further augmentation of supply will be difficult and expensive.

The WCA includes the following components:

1. Implementing science and technology to enhance water use efficiency and availability (50-60% of WCA effort).
2. Improving aquifer recharge and soil water storage: helping communities with revolving loans and grants to enhance water harvesting technologies and livelihood activities (10-20% of the WCA effort). In the Badia, the revolving loans will complement a separate implementation mechanism between the GOJ-BRP and USFS that is focused specifically on seedling production and transplantation by Rangeland Cooperatives (RLCs).
3. Strengthening the capacity of institutions that support and sustain Components 1 and 2 (20-30% of the WCA effort). This could include possible financing for a dozen Master's degree programs to support capacity development objectives.

2. BACKGROUND

2.1 *Statement of Challenges and Opportunities*

Jordan is the one of the five most water poor countries in the world¹ and is struggling to balance water supply and demand. On top of its 6,984,000 citizens² and 2.2 percent³ population growth rate, there are approximately 630,000 registered Syrians⁴ and 750,000 resident Syrians⁵ who were in Jordan prior to the civil war, who also require water. To quench their thirst, Jordan absorbs and faces rapidly increasing costs to expand delivery – yet the new sources of supply are very expensive.

Groundwater is over-extracted for irrigation and drinking water at twice the rate of recharge, which will further reduce the availability of water in Jordan. In order to take steps to understand and better manage the problem, the Ministry of Water and Irrigation (MWI) commissioned a comprehensive socio-economic survey of groundwater wells across the Kingdom. USAID's Institutional Support and Strengthening Program (ISSP), collaborating with MWI, used existing studies and reliable data recently collected at the farm level. The key results from the eight most important basins in Jordan are as follows:⁶

1. Mafrq is the leading basin in the total estimated abstracted groundwater for agricultural uses followed by Azraq. Mafrq basin represents 28 percent of the total groundwater abstraction in all basins followed by Azraq basin at 23 percent.
2. Across all 8 basins surveyed, 55 percent of the volume of groundwater was used to irrigate olive trees, led by Mafrq and Azraq. In Azraq, 71 percent of the total abstracted water was used only for irrigation of olive trees.
3. Results show that 73 percent of the total abstracted groundwater was used by large farmers (380 farms with greater than 20 ha).
4. Based on crop water requirements, 333 of 1240 respondents are abstracting more than 150,000 m³/year of underground water with 7.2 percent of these farms producing only for export.
5. In two-thirds of the cases, regardless of farm size and across all basins, family members do not live on their farms. For small farmers, 67 percent do not live on their farms; and 37 percent earn less than 20 percent of their total income from farming. Both of these factors raise doubts about the social and economic significance of small farms. The majority of these small farmers (96 percent) pump less than 50,000 m³ of water per year but because the volume is less than 150,000 m³/year they are also not charged for water, which in some cases is being pumped and sold (which will be tackled by another USAID activity on policy matters).

¹ http://www.fao.org/nr/water/aquastat/maps/World-Map.TRWR.cap_eng.htm: Total Renewable Water Resources (TRWR) in m³/person/year -- (1) UAE 18.5; (2) Yemen 82.13; (3) Saudi Arabia 83.61; (4) Libya 108.20; (5) Jordan 145.10; (6) Palestinian Authority 196.00; (7) Israel 231.30; (8) Algeria 319.80; (9) Tunisia 429.20; (10) Oman 482.10. View against TRWR in the USA at 9718 m³/person/year.

² <http://data.worldbank.org/indicator/SP.POP.TOTL>

³ <http://data.worldbank.org/indicator/SP.POP.GROW>

⁴ <http://data.unhcr.org/syrianrefugees/regional.php>

⁵ https://pangea.stanford.edu/researchgroups/jordan/sites/default/files/El-Naser%20Stanford%20presentation_0.pdf

⁶ USAID (December, 2014 version). Socio-Economic Analysis Report of Groundwater Wells in Jordan, All Basins Report.180 pp. with 8 Appendices. See pp. 37-40 for data referenced. Prepared by USAID/Jordan Institutional Support & Strengthening Program (ISSP). <http://isspjordan.org/files/upload/resources/0e74f727c0fdb580fb8b1c0070b8cf8.pdf>

The total irrigated areas increased from 66,603 ha in 1994 to 102,400 ha in 2010⁷ with the main expansion in the Highlands. The summarized version of the same study gives the allocation of water consumed by irrigation (Table 1). Irrigated agriculture consumes 55.5 percent of the available surface, ground and treated waste water, while only contributing 3 percent of Gross Domestic Product (GDP). More value per cubic meter of water can be achieved by improving the efficiency of water use by improving the technical and advisory services delivered to farmers. Such initiatives have the potential to create 15,000 new jobs in agriculture (2030 Water Resources Group Report⁸). New jobs are desperately needed in Jordan, as the data point to significant youth and female unemployment issues in Jordan.

Table 1. National Water Supply and Consumptive Use in Million Cubic Meters (MCM), (MWI data, 2010).

Source	Domestic	Industrial	Irrigation	Livestock	Total	Share
Surface water	120.0	6.6	154.5	7.0	288.1	31.9%
Ground water	231.7	33.9	245.0	0.3	510.9	56.6%
Treated wastewater	0.0	1.5	101.5	0.0	103.0	11.4%
Total water used	351.7	42.0	501.0	7.3	902.0	100.0%
Share	39.0%	4.7%	55.5%	0.8%		

There are four challenges associated with the over-use and insufficient water conservation in Jordan:

1. Policy Environment
2. Lack of Usage of Water-Saving Technologies
3. Insufficient Aquifer Recharge and Soil Water Storage
4. Lack of Institutions to Support Technology Adoption

Policy Environment. A large part of the lack of competitiveness for private sector companies in the water sector is undoubtedly due to the existing price of water being so low that there are few incentives to drive conservation efforts, encourage the purchase of water-saving technologies, or ultimately reduce water usage for those who have access to water. Policies and regulations are not working or are not being enforced to recover costs in the water sector sufficiently to incentivize the use of water-saving technologies. Compliance and enforcement are policy implementation issues and a management challenge. Theft of water is difficult to control. WCA will work with a complementary activity in USAID/Jordan that will tackle the policy issues; but *the main concentration of effort in WCA will be the following three challenges:*

Lack of Usage of Water-Saving Technologies. One notable wide-spread technology for water conservation is drip irrigation, which is presently used across the country; however, management of drip irrigation is very bad and there is very slow adoption of pipelines with durable plastics that last up to five years instead of 1-2 years. Many other technologies are not being purchased and used on a wide-scale basis although there is a demand for many of the interventions because they save money for electricity and for water. In addition to physical technologies, there are management and behavior best practices that

⁷ Source: USAID, 2012. Water Valuation Study, Oct 2012. USAID/Jordan Institutional Support and Strengthening Program (ISSP), p.52

⁸ 2030 Water Resources Group (2011). Accelerating water sector transformation in Jordan. Final Report. 20 October 2011. p.7; and p.32 of a publicly available document (http://www3.weforum.org/docs/WEF/WRG_Background_Impact_and_Way_Forward.pdf).

are not being rigorously applied, such as deficit irrigation or supplementary irrigation. Interviews with water users reveal that they are not using these technologies and/or management practices because they need extension and advisory services, which are weak in Jordan.

Insufficient Aquifer Recharge and Soil Water Storage. Approximately 3 billion cubic meters of water fall in the Badia every year but only 90 MCM, or 3 percent, are harvested and utilized due to the lack of water harvesting systems that are needed to capture and store the water. Rainwater runoff catchment ponds, grazing management, vegetative cover on watersheds are all known and proven techniques to encourage aquifer recharge and soil water storage.

Lack of Institutions to Support Technology Adoption. One bottleneck to adopting water-conservation, storage and aquifer recharge technologies is the lack of local institutions to support adoption. Local institutions, especially Government of Jordan (GOJ) institutions, typically are able to fund the salaries of employees but are limited in their operational budgets and, therefore, have a weakened ability to provide services.

Cross-cutting access to finance issues. In many cases there is a demand for the new technologies at the household, community, and/or farm level but financing is not available and/or is unaffordable, preventing widespread purchase of the technology. Availing communities with revolving loans, commercial loans (where acceptable) and grants to enhance livelihoods and water saving technologies would assist all of the physical target areas of the WCA – in the Jordan Valley (JV), Highlands and Badia.

2.2. Relationship to the USAID Strategy and US Foreign Policy Objectives in Jordan

The development hypothesis is that in order for water to be sustainably available, conservation and management of water by Jordan's end users at the household and agricultural levels is essential. This approach is aimed at reducing the amount of ground water, municipal water, and/or potable surface water needed for a given use and/or capturing rainwater to support a household and/or agricultural use (including aquifer recharge and soil water storage). Capturing rainwater is important especially in rural areas, where households are already using lower than average amounts of water. Captured rainwater will reduce either municipal and/or groundwater usage or it will at least reduce the need to drill deeper and deeper wells to access groundwater. Institutions are needed that can sustainably promote these cutting edge technologies (and their financing) so they can be rolled out and utilized more widely.

Provision of water for household, commercial and livelihood needs is a critical service provided by GOJ institutions. It is equally important to match level of water quality with quality required for use, meaning that the best water quality need not be allocated for agriculture. This directly addresses:

- *Development Objective (DO) #3, of USAID/Jordan's Results Framework, which is "Quality of Social Services Improved."*
 - *This Activity focuses on Intermediate Result (IR) #3, "Accountable, sustainable management of water resources increased," which supports:*
 - *Sub-IR 2 "Water Conserved," which targets water savings of 10-20 MCM in five years.*

Activities leading to water conservation through the use of improved agriculture technologies to grow water-efficient, high-value crops will also have a secondary impact and contribute to:

- *DO#1 "Broad-based inclusive economic development accelerated," through:*

- IR#1, “Private sector competitiveness increased;”
- IR#2, “Workforce development and opportunities for vulnerable groups increased, especially for the poor, women and youth”; and
- IR#3, “Management of energy resources improved⁹.”

2.3 Relationship to Government of Jordan and Other Jordanian Priorities

The GOJ is a close partner to USAID, with the Ministry of Water and Irrigation (MWI), playing the major role under Development Objective #3, along with lesser roles played by the Ministry of Environment (MoENV) and the Ministry of Agriculture (MOA).

- MWI developed a national water strategy titled “Water for Life” for the period of 2008-2022. Water demand goals include capping irrigated agriculture in the Highlands and adjusting water tariffs and incentives to promote irrigation efficiency and higher value crops.
- The Minister, MOA, acknowledges that the agricultural industry is under pressure to better use Jordan’s scarce water resources. The MOA is supportive of incentives to encourage the growth of less water-intensive crops and signaled a willingness to work with USAID on range shrub seedling production, establishment and management to restore the Badia watersheds. MOA supports work to increase water efficiency and productivity in the agricultural sector; encouraging high value, low water-use crops; and potentially exploring other income-generating activities in rural areas.
- The GOJ-BRP in the MoENV is a \$160 million program funded by the UN Compensation Commission (UNCC), working to rehabilitate and restore rangelands in the Badia that were damaged by the influx of Iraqi refugees and their livestock herds following the first Gulf War. The program plans to: (1) construct a network of earthen dams that create small reservoirs to function as livestock watering points, sources of irrigation water, and groundwater recharge areas, (2) conduct watershed-scale re-vegetation efforts using a range of native shrubs, and (3) encourage improved rangeland management practices. The WCA proposes to work in an overlapping set of communities to complement the GOJ-BRP support from the USAID Inter-Agency Agreement with USFS, focusing on shrub nurseries and plantation techniques with RLCs.

2.4 Complementarity with Other Donor Efforts

USAID does not work in isolation and care must be taken to de-conflict, build upon or complement the efforts funded by other donors. Two primary stakeholder fora and the following list of successful donor projects have brought together farmers, governmental representatives, university researchers, and donor partners to advance issues of agricultural productivity, water management, and marketing in the JV and the Highlands.

- Germany’s *Gesellschaft für Internationale Zusammenarbeit* (GIZ) is the facilitator of the Highland Water Forum (HWF), which brings together stakeholders, including influential Highland farmers, and representatives from MWI, MOA, MoENV, NGOs, academia, and local groups in Azraq to discuss new agricultural techniques, approaches for transitioning to higher

⁹ The Activity aims to make available both water- and energy-saving devices such as brackish water desalination units and photo-voltaic panels. In all cases, implementers will collect indicator data that we will share with the relevant projects and personnel at USAID who manage the efforts.

value, less water-intensive crops, and reforming policies for water use in the agricultural sector. The HWF was formed in 2010. One of its advantages is its legitimacy as a venue where Highland water users can speak about their concerns, which provides an important forum for WCA to intersect and show USAID's alignment with the HWF agreed-upon plan of work.

- The Jordan Valley Water Forum (JVWF) is not as well developed as the HWF, with representation from Water User Associations (WUA), agricultural investment companies and governmental entities i.e., Jordan Valley Authority (JVA), MWI, MOA, and the Ministry of Planning and International Cooperation (MOPIC).
- European projects in the JV are working on topics that all aim to improve infrastructure, conserve and better manage water that are complementary to WCA, including (a) Germany's *Kreditanstalt für Wiederaufbau* (KfW) infrastructure loan of €20 million and €1.5 million grant for accompanying measures and, (b) a sequence of three European Union projects in the JV concerned with irrigated agriculture.

3 ACTIVITY OVERVIEW

3.1 Activity Purpose, Sub-purposes and Approach

WCA will focus over the next five years on conserving water by utilizing proven, improved and cutting edge technologies. The Activity is results-based and focuses on the Sub-Intermediate Result "Water Conserved." In other words, **conserving water is the main programmatic goal/result that will be sought under WCA.** WCA will seek to save and/or conserve between 10-20 MCM of water during the five years of the activity.

In short, getting people to adopt water-conserving practices, they need to know about them, understand how they work and believe that there is a personal benefit for adoption. The WCA will seek to achieve its water savings goals by addressing three objectives:

1. **Water conserving technologies and behavior changes can be adopted** by introducing agriculture and household technologies; promoting interventions such as cisterns, roof top water tanks, durable new replacement drip irrigation networks; implementing wastewater treatment and reuse and using recirculating hydroponic systems and brackish water desalination across the country (Figure 1).
2. **Sustainable soil water storage and aquifer recharge can be improved** through incentives that save water and also improve livelihoods. The WCA will supply communities with revolving loans and grants to enhance livelihoods and use water saving technologies. This component will complement a G2G¹⁰ effort between the USFS and GOJ-BRP that is focused specifically on water conservation through rangeland shrub seedling production and transplantation.
3. **Institutions must be strengthened to promote water saving technologies** to ensure widespread and sustainable adoption of technologies in the previous two components through resolving bottlenecks such as their access to technologies, demonstrations, vocational-technical education, advanced degree programs, and finance¹¹.

¹⁰ G2G: Government to Government (GOJ – USG)

¹¹ WCA will coordinate with other efforts to promote technology and private sector participation in this process, especially the USAID/Washington Middle East Water Security Initiative regional program and the USAID/Jordan Competitiveness Program.

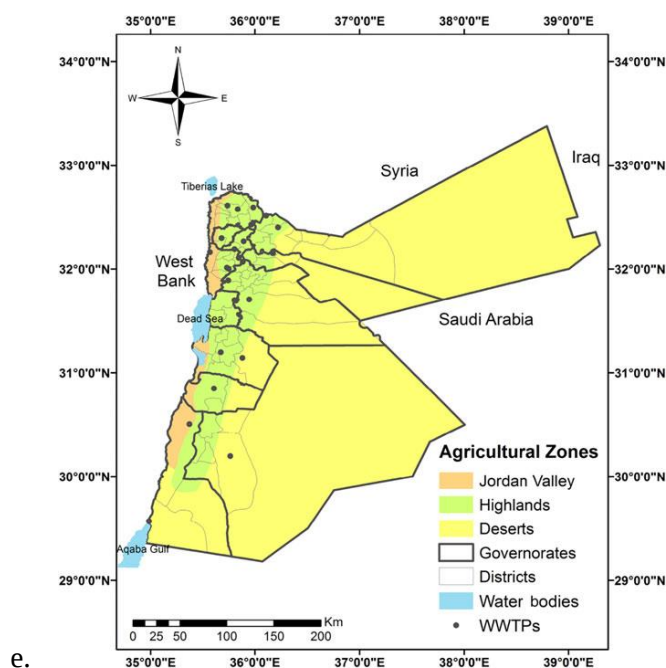


Figure 1: Map of Jordan showing the JV, Highlands and deserts (Badia).

During the 5-year Activity the WCA will:

- Promote a variety of technologies including hydroponic production, construction of cisterns and water harvesting for water conservation in the JV, Highlands, and Badia with potential secondary impacts on creation of greater incomes, jobs for youth and women-run businesses in Jordan.
- Assist households and farms both save and harvest water; store and efficiently use water; and/or transform lower quality water for domestic and/or agricultural use.
- Support GOJ-BRP, through technical and financial assistance from the USFS, to successfully demonstrate proper seedling production and transplantation techniques with RLCs in the Badia.
- Initiate integrated watershed management and training in the WCA, leading to improved aquifer recharge and increased soil water storage, providing a model for replication in the GOJ-BRP.
- Strengthen local institutions that will continue to promote technology adoption after the end of the activity.

To have a large scale impact and due to the urgency of this effort, the activity must focus on the most wasteful existing uses of water and where the potential to save water is the greatest; therefore, the geographic focus will include:

- A focus on households, primarily in the refugee-affected areas, for establishment of cisterns and new activities of interest to Community Based Organizations (CBOs) and RLCs.
- A portion of the JV as far south as Fifa, where there is already a sizable investment in greenhouses that could be converted to closed, recirculating, hydroponic systems.

- Work with owners of irrigated olive plantations in Mafraq and Azraq basins¹² to adopt hydroponic production of high value, water-saving crops.

3.2 Activity Outcomes

3.2.1 Outcome 1: Water-saving technologies and behavior change adopted

WCA will promote technology alternatives that use much less water than the existing practices. Although these types of water conservation practices are needed across Jordan, the focus will be on proving, promoting, and adopting technologies where the impact on conserving water will be the greatest. WCA will encourage their roll-out across the country by collaborating with the GOJ, other donors, the private sector and community groups. The challenge for the implementer will be to fashion a parsimonious and focused application that chooses wisely from a large suite of possible interventions and approaches. The applicants should select an optimum combination of interventions in their submission.

WCA seeks water-saving technologies with the greatest potential for impact. To promote and share technologies, interventions could complement the new and existing technologies supported by USAID, such as the Community Based Initiatives for Water Demand Management (CBIWDM), implemented by Mercy Corps; the Water and Livelihoods Initiative (WLI), implemented by ICARDA (<http://www.icarda.org/wli/reports.html>); the Hydroponic Green Farming Initiative, implemented by ECO Consult; and the Middle East and North Africa Network for Water Centers of Excellence (MENA-NWC), implemented by DAI (<http://menanwc.org>). For the CBIWDM and HGFI, seminal documents can be located on the USAID/Jordan portal (<https://usaidjordankmportal.com>). Applicants may search for documents under "Collections" in a folder entitled "Water Conservation."

WCA will support household and community level water-saving and livelihood interventions. WCA expects to increase the number of highly trained women in community leadership positions in CBOs/WUAs/RLCs across the JV, Highlands and the Badia. The WCA will continue providing households with cisterns, rooftop water tanks, PV panels and plumbing fixtures using new WCA grants to interest-free revolving loans to CBOs/WUAs/RLCs (selected by the implementer).

For commercial loans, the implementer should also develop access to finance needed for interventions such as desalination units, warehouses and cold chain equipment by interacting with several "access to finance" projects that already exist in the USAID/Office of Economic Development and Energy (EDE).¹³ Additionally, new partial credit guarantees could be made available through the Development Credit Authority (DCA) – if demand exists – through a separate but coordinated mechanism after the WCA is launched.

¹² The Jordanian Department of Statistics (Yearbook, 2013) reported total production as 128,200 tons grown on 62,300 ha. According to NCARE, the irrigated portion in the northeast of Jordan represents 24 percent of the national production which is further divided into 83 percent that is processed for olive oil and 17% for table olives (<http://www.ncare.gov.jo/OliveProgram/index.htm>). Thus, the Activity would attempt to convert olives grown by a relatively small group in two specific basins – Mafraq and Azraq – who are consuming a large portion of the country's groundwater.

¹³ Jordan Guaranteed Loan Fund (JGLF); Local Enterprise Support (LENS); Jordan Competitiveness Project (JCP); Energy Sector Capacity Building (ESCB). For example the WCA may participate in the "Deal-Flow" Unit (a working group among the aforementioned projects).

In the case of agricultural CBOs, WUAs, and RLCs, linkages to the USAID/EDE Work Force Development program could train youth, at first with grant assistance but eventually with fees paid to the CBOs by members for vocational-technical services. The youth could be taught how to decrease household water and energy bills (e.g. hydroponic nutrient and salinity monitoring, post-harvest management, and marketing) and help CBO/WUA/RLC members to switch from low water-value to high water-value crops. One plausible hypothesis is that by producing what both saves water and sells for a good price, agricultural members of CBOs/WUAs/RLCs could associate and aggregate their fruits/vegetables for sale through contracts made with exporters and domestic buyers; thus developing an increased cadre of people using water-saving, money-making hydroponic practices.

Under the WCA, it should be possible to double the number of cisterns from 5,000 to 10,000, should the implementer choose to implement this intervention in their proposed plan. The implementer must recommend whether to continue to work with the existing revolving loans or modify the activity to be more effective under present conditions. For example, the implementer might develop commercial loans for CBO members who are willing to use them, possibly backed by partial loan guarantees through the DCA.

Illustrative Technical Interventions: The following are potential technologies and interventions that could be used but are not required:

- Implementers are encouraged to select an optimum suite of interventions to demonstrate and feasibly scale-out new water-saving technologies that have little penetration in Jordan, e.g. hydroponic production, which represents a viable method for producing more vegetables using far less water and inputs, less money, and less time.
- Improved rain-fed farming techniques using water harvesting could shift the dependence away from fully irrigated to dryland production techniques that are complemented by limited amounts of irrigation to ensure a good harvest.
- Conservation agriculture in the arable Highlands (i.e. low- and no-till plowing) or a shift from full to supplementary irrigation in the Jordan Valley could be adopted to also save water.
- Improved irrigation efficiency resulting in water savings at the farm level and decreased exploitation of groundwater would save water through: (a) optimizing the efficiency and durability of the irrigation network and management practices; (b) use of higher quality filtration systems and emitters; (c) use of mulch under stone fruit and olive trees; (d) improved drainage systems; and (e) training.
- Improvement of treated wastewater reuse or integration of constructed wetlands into community effluent management could off-set the use of groundwater and protect water quality in Jordan.
- Low cost innovations for desalination of brackish water could enhance hydroponic production in Jordan and the Middle East.
- Promotion of packages of technologies to save water by households and other groups might be a good approach: CBOs, WUAs, RLCs, schools, hospitals, and government buildings -- using, for example, rooftop water tanks, backyard cisterns, grey water and wastewater systems.

3.2.2 Outcome 2: Sustainable aquifer recharge and soil water storage improved

Cooperation with GOJ-BRP is required: In order to feed water into the aquifers and soils, the GOJ-BRP calls for the construction of hundreds of dams and ponds in the Badia as well as thousands of

hectares of shrubs planted in furrows plowed on contours to catch and hold water to sustain the shrubs. The MoENV coordinates this effort with support from MOA on the shrub transplantation, NCARE on contour furrowing and JVA on dam and pond building. The USFS will now expand the program by developing a separate G2G arrangement between GOJ-BRP and USFS to focus on seedling production and transplantation techniques by RLCs. This will demonstrate that Badia restoration can be successfully scaled out over time.

Sustainable soil water storage and aquifer recharge can be improved through incentives that save water and also improve livelihoods. The WCA will supply communities with revolving loans and grants to enhance livelihoods and use water saving technologies. It will complement the GOJ-BRP effort by using community grants and revolving loans for individual households to enhance livelihoods, while also using water more efficiently. Using USFS technical assistance, the RLCs will improve shrub nursery production techniques so that they can cooperate to produce seedlings for the GOJ-BRP. The RLCs, again with financial and technical support from USFS and GOJ-BRP will then transplant these shrubs into contour furrows.

Efforts outside the Badia: These same water harvesting techniques can be used anywhere in the country and may have more success because of the higher precipitation in zones receiving more rainfall than the Badia. For example, fruit tree and olive plantations in the area between the JV and Highlands, receiving 200-350 mm of annual rainfall, are potential high impact areas for these interventions. The implementer should outline their suggested level of effort, either in collaboration with GOJ-BRP in the Badia and/or independent from the GOJ-BRP in the JV and Highlands.

Illustrative activities: The following list of interventions are not mandatory; however, they indicate activities that could focus on critical gaps and enhancements to implementation; complementing the GOJ-BRP, or even adding to their efforts to encourage scaling-out, if mutually agreed upon by the respective management teams.

- Construction of rainwater catchments, ponds, cisterns, and gray water recycling systems in areas where water recharge and storage is targeted (e.g. JV with WUAs; Highlands with CBOs; Badia with RLCs).
- Women-organized/grown/managed nurseries to supply plants for ornamental use and/or vegetable seedling “starts” for hydroponic greenhouses.
- Green fodder (e.g. barley grown hydroponically in trays) scaled out through use of revolving loans as a way to supply animal fodder; therefore, reducing open grazing on newly rehabilitated shrub plantings.
- Guard against siltation of ponds and reservoirs in the Badia using proven technologies to slow sedimentation and plants to increase filtration on the watershed.

3.2.3 Outcome 3: Institutions strengthened to promote water-saving technologies

The WCA implementer should select interventions, such as the following illustrative activities, to ensure that robust local institutional capacity is in place to support the communities after the project is completed.

Illustrative activities that create access to finance, education, extension and advisory services (to strengthen value chains related to saving water) could include these non-mandatory approaches:

- Support CBOs/WUAs/RLCs and schools that are promoting water-conserving, storing, or desalinating technologies and give them technical assistance to help develop high quality materials.
- Facilitate community level dialogue and enhance stakeholders' access to water conservation information, with special attention to vulnerable populations, especially women and youth.
- Assist private sector vendors to network with farmers, community groups, and international vendors of cutting edge technologies not yet available in Jordan and help distribute information on use of the technology.
- Enhance workforce capacity in collaboration with the Technical and Vocational Education (TVE) institutions to provide vocational and workforce training in water conservation.
- Build capacity at TVE institutions to prepare graduates for employment and to conduct research to support water conservation implementation.
- Develop university curricula, student internships, in-service practical training, and faculty development related to water conservation.
- Facilitate other types of assistance, such as business skills and logistics support for farmers who are marketing water-saving agricultural crops.
- Support for the existing public sector institutions to promote and market proven technologies and demonstrations that lead to the roll out of the technologies and measurable water savings.
- Give competitive grants focused on programmatic gaps or opportunities, with a bias toward maximizing water savings per USAID dollar contribution to the grant.

A. Local institutional strengthening

WCA will provide access to technologies, demonstrations, and financing using training, advisory services and extension to interested and committed partners. This outcome will primarily focus on coordinating and supporting groups willing to help achieve the results sought under Components 1 and 2.

WCA will collaborate with other partners to promote technology and private sector participation in this process, especially USAID/Jordan's EDE, where several projects¹⁴ are under implementation related to access to finance, energy and workforce development across the country.

B. Grants

Institutional Support Grants: WCA will seek ways to train and support motivated farmers, employees and organizations who agree to utilize new technologies and measure the savings of water that their efforts produce. WCA will encourage water savings by supplying grants to groups willing to provide extension, advisory or vocational-technical services on converting to water-saving crops that have high market demand. WCA will not hire extension agents to substitute for the lack of extension workers in the country but will focus on providing training to groups of people already employed and/or working in the

¹⁴ Jordan Guaranteed Loan Fund (JGLF); Local Enterprise Support (LENS); Jordan Competitiveness Project (JCP); Energy Sector Capacity Building (ESCB), Workforce Development Project (WfD). If a partnership is created the program will collect indicator data of interest for AORs/CORs in EDE, e.g. number of PV panels purchased with commercial loans to decrease energy costs in pumping water or heating structures.

sector who are willing to update their practices to reduce water usage (NCARE, Royal NGOs, NGOs, CBOs, WUAs, RLCs, universities).

C. Non-Interest Revolving Loans and Commercial Loans

The applicant should consider CBOs, WUAs and RLCs for revolving loans. There is a long waiting list for revolving loans because the loans are small with a long repayment period. Grant funding already in the community should continue to support revolving loans in CBOs but it is not necessary to work with all 177 CBOs from the former USAID project. The implementer will recommend whether to extend a similar revolving loan program to support CBOs, WUAs and RLCs for small-scale water conservation interventions. USAID has turned over long-term monitoring of the revolving loan program to the Ministry of Social Development (MoSD) (<https://usaidjordankmportal.com>). For USAID and the applicants, the revolving loan exit strategy and sustainability plan involves working with MoSD to monitor revolving loans so that they may reliably continue to serve the community.

The successful applicant will show how to expand access to finance, for example, by turning to commercial credit, for at least the segment of CBO/WUA/RLC members willing to take interest-bearing loans. It is the responsibility of the implementer to recommend acceptable terms for more loans and larger loans that will accommodate additional water-saving technologies under the revolving loan activity. Community grants may be used to incentivize the program. Demonstrations and Cost/Benefit Analyses could be used to indicate a high probability of successful repayment for loans that provide access to water-saving technologies.

D. USAID Development Credit Authority (DCA)

If the implementer is able to organize sufficient private sector interest in water-saving technologies, they will have access to the USAID/EDE programs and the USAID/DCA partial loan guarantees. It would be the implementer's responsibility to coordinate and facilitate this access to finance, with AORs/CORs and COPs/DCOPs within USAID/Jordan.

USAID's/DCA uses risk-sharing agreements to mobilize local private capital to fill financing gaps. For example, promoting hydroponic farming and easing up-front system costs will allow implementers to identify a supplier or an entity to assemble an entire hydroponic system. Through this model, the supplier extends a system on credit to interested farmers, with USAID/DCA guaranteeing 50% of any default. Creditors thus reduce their risk when providing loans to farmers, who previously may not have had access to such lending mechanisms, due to lack of collateral.

E. Summary of Modules in the WCA

I. USAID WCA Cooperative Agreement	Percent of Activity
<u>Component 1: Implementation of science and technology to enhance water availability, including:</u>	<i>50-60%</i>
Revolving loan funds to CBOs/WUAs/RLCs as grants	
Partial assistance for water conservation technologies, as grants	
Community grants to incentivize water conservation	
<u>Component 2: Enhance aquifer recharge and soil water storage, including:</u>	<i>10-20%</i>
Revolving loan funds for RLCs as grants	
Partial assistance for water recharge/storages, as grants	
Community grants to incentivize water conservation	

Component 3: Institutional strengthening, including:	20-30%
Vo-Tech training grants	
WCA Total	100%

4 CROSS-CUTTING STRATEGY

4.1 All Mission Development Objectives Must Contribute to Four Cross-Cutting Results

4.1.1 Gender

Interventions with farmer organizations and CBOs will include women and also target women's increased participation; therefore, increase their ability to contribute to civic life in rural Jordan. In the course of developing value chain markets for new water-saving commodities, it is expected that women-led groups, women farmers, and women participants in farmer groups will play lead roles in these activities that not only save water but also increase their potential incomes. It is also anticipated that women will be the beneficiaries of training interventions aimed at promoting and rolling out of new technologies; therefore, linking the activity to:

- DO#4, 'Gender equality and female empowerment enhanced,' through:
 - IR#3, "Improved girl- and women-centered services."

Applicants must demonstrate their understanding the different roles that men and women play in their respective areas of intervention and the impact that societal challenges have on each gender. They will also be required to describe what actions they will take to help men and women play their roles and surmount gender challenges, including: defining the activity-relevant gender challenges and opportunities, describing their approach for addressing gender issues, and providing relevant performance indicators to measure their achievements. Appropriate gender indicators will be tracked throughout the life of the program and progress will be measured by both the implementing partners of the activity mechanisms, with support from the M&E Support Program. Applicants will also be required to ensure that their long-term staff includes someone with expertise on gender issues, and that gender principles are adhered to within their own operating environment as well as in fielding additional short-term consultants. During activity implementation, the applicant must ensure robust participation of women as agricultural development professionals.

Gender disaggregated indicators will be collected whenever applicable, including an indicator that tracks changes in income levels for women. Research and demonstration activities will be designed with gender roles in mind to ensure the inclusion of income-generating activities appropriate for women. Capacity building efforts will include targets for women's participation.

The following are potential approaches that could be used, but are not mandatory:

- Provision of technical assistance to CBOs/WUAs/RLCs and stakeholder fora with female beneficiaries to expand ownership and management opportunities.
- Pilot youth re-vegetation activities may include women as members and/or managers of re-vegetation crews.
- The activity should ensure that women are included in the target audience for microcredit loans to facilitate alternative livelihood activities, such as hydroponics seedling "starter" plant production nurseries.

- Build up new women-run high-value, low-water use crop value chains using the training and experience of women-run CBOs to mentor younger organizations that are run by women.
- Support women to integrate agronomic practices, processing, aggregation of product, and marketing of high value crops. Part of this chain can be assembled by tapping into the highly trained, but underemployed, women from universities to partner with CBOs in the value chains. For example, women graduates with a background in marketing and agriculture could connect potential hydroponic vegetable and herb suppliers from CBOs/WUAs/RLCs with orders from agribusiness exporters.

4.1.2 Youth

Interventions to promote new technologies, especially with the private sector, will seek to include youth in training and job creation. The following are potential approaches that could be used, but are not mandatory:

- Establishment of vocational-technical courses for male and female youths to prepare them for jobs in hydroponic production of high value herbs, fruits and vegetables.
- Formation of specialized planting brigades that may work in cooperation with the GOJ-BRP, USFS and RLCs to skillfully transplant high quality rangeland shrub species into contour furrows.
- Determine a method to dynamically measure day-to-day water volumes in cisterns and water tanks.

4.1.3 Stability and Conflict Prevention

Having a decreasing supply and/or not enough water creates dissatisfaction with government services.

There is a high possibility of unrest and violent protest related to not receiving sufficient water.

Strengthening the capacity of CBOs/WUAs/RLCs to promote the conservation of water helps to mitigate insufficient access to water as a local-level driver of conflict.

Illustrative Activities: The following are potential activities that could be used, but are not mandatory:

- The activities in north Jordan with CBOs, where there is less water available than in the past due to the needs of Amman, may demonstrate to other households and end users how to obtain more water from other sources like rainwater and water reuse.
- The activity may explore ways to offer revolving loans to beneficiaries and/or small and medium sized enterprises with less capacity to repay – for example, those located in poverty pockets who may have less access to finance.
- To address tensions and build cohesion in host communities, the activity may explore how Syrian refugees can benefit from loans and/or other (non-monetized) forms of assistance and participate in training programs.

5 MONITORING AND EVALUATION (M&E) PLAN AND LEARNING APPROACH

5.1 M&E Overview

USAID/Jordan will track the progress of project activities toward achieving the Mission's Development Cooperation Strategy Development Objective of "Quality of Social Services Improved," as well as relevant intermediate results (primarily I.R. 3.3 "Accountable, sustainable management of water resources increased" and I.R. 3.3.2 "Water Conserved") and also secondary results under other development objectives and activity goals. Per USAID's Automated Directive Service (ADS) 201, the M&E Plan of the implementer should mention the plan for baseline data collection, including ensuring that gender-disaggregated baseline data is collected. Monitoring of performance will be an on-going collaborative process, integrating data across all implementing mechanisms with the participation of implementing partners and GOJ ministries (e.g., accessing their data for baselines and periodic checks on progress). Technical support will be solicited from the USAID/Jordan Gender and M&E Specialists to ensure that objectives and targets are adequately addressed in project design, work plans, and monitoring plans.

Indicators will be measured at the IR and Sub-IR levels:

- Cumulative cubic meters of water saved annually from water-saving technologies.
- Number of adoptions of new technologies to save water or increase reuse of water.
- Number of GOJ water entities, NGOs, community groups, or beneficiaries promoting water conservation with USAID support.
- Number of new technologies adopted that promote aquifer recharge and soil water storage.
- Number of women CBOs/WUAs/RCs having access to commercial financing to support the rollout of water-saving technologies.

Cross-cutting IR indicators:

- Sex disaggregation of indicators – with intention to increase percent women over time such as adopting new technologies and obtaining financing for the technologies.
- Number of women and youth employed in water conservation/value chain activities initiated by WCA.
- Number of women CBOs engaged in water conservation/value activities promoted by WCA.
- Percent of women in revolving loan management committees.
- Percent of women in training events.
- Number of CBOs/WUAs/RCs taking action to mitigate conflict (including the conservation of water).
- Number of women and girls benefitting from new or improved USG-supported social services targeted at women and girls
- Percentage of female participants in USG-assisted programs designed to increase access to productive economic resources

The implementing partner may also provide suggested new custom indicators for USAID to track.

The WCA will develop approaches to measure water conservation and savings and will report on this as required. Late in Year 2, an internal mid-term project evaluation will be conducted to validate the key assumptions in the log frame and to inform implementation over the remaining three years of the project. The mid-term will review the following questions: How many cubic meters of water were saved and how many new technologies were adopted? Are the interventions distributed in a manner to maximize water saving? Are the demonstrations generating enthusiasm and are agribusinesses willing to take on commercial loans? Are agribusinesses sourcing vegetables from CBO/WUA /RLCs members? Have any Highland farmers abandoned their olives and converted to hydroponics? Are cross-cutting issues and results being adequately considered and impacted?

Key findings from mid-term evaluation will be shared widely to encourage mutual learning and transparency across project participants. Regular meetings with implementing partners, CBOs/WUAs/RLCs, government partners, donors, GOJ-BRP, HWF, JVWF and other key stakeholders will be held to discuss the progress of individual activities and project outcomes to facilitate learning and identify ways to implement necessary mid-term adjustments. We want all partners to examine the basic question: Has this USAID project had an impact on water conservation?

A final external performance evaluation will be considered in Year 5. However, it is likely that the mid-term evaluation will be used to determine whether to continue for another phase.

Through the evaluations and indicators, it should be possible at Year 5 to determine whether the assumptions made at the beginning of the project are valid, i.e. (1) the private sector is outsourcing to CBOs/WUAs/RLCs who aggregate high water-value products for export; (2) disease and insect issues that might jeopardize sustainability are better understood; (3) access to commercial credit is now assured, (4) shifting of olive farmers to hydroponics in the Highland basins (Mafraq and Azraq) is well underway.

6 SUSTAINABILITY

6.1 Sustainability Analysis Overview

The primary objective of the WCA program is to improve the sustainability of the water sector; specifically the availability of water in Jordan. Therefore, the three components of the program focus on the critical and urgent result of conserving water, namely, (1) water conserving technologies adopted;(2) sustainable aquifer recharge and soil water storage improved; (3) institutions strengthened to promote water saving technologies.

Conservation of water needs to occur among groups that use the most water and/or on a scale that will be meaningful. For the purposes of integrating sustainability into USAID's project design process, sustainability is achieved when host country partners and beneficiaries are empowered to take ownership of development processes, including financing, and maintain project results and impacts beyond the life of the USAID project.

WCA tackles household water demand management and agricultural water use. In order to be considered a success the intervention should be replicable, scalable, and sustainable, measurably decreasing the allocation of water to agriculture. Our sustainability analyses have determined that there are many technologies that have already been proven in Jordan and other countries to save water, and these technologies will be promoted in the program. However, the analyses also reveal that there are 1)

enabling environment and 2) institutional issues that are bottlenecks to widespread use of the water-saving technologies.

Promoting a technology alone will not resolve the sustainability issues. This is why the approach of the WCA is to seek out ways to resolve enabling environment issues, like the low cost of water (through another USAID program) and the lack of finance through loan guarantees. The sustainability analyses also revealed that institutions are needed that can support the process over a long time without donor funding. Consequently, it will seek to support the private sector, which can sell the needed technologies and/or obtain financing from those who receive services, to engage with the communities, to market products and/or to engage in outsourcing schemes with agribusinesses.

At the government level, analyses show that the sustainability of improving agriculture technologies is affected by a shortage of personnel and insufficient incentives for employees. Training systems for the agriculture sector, as per the agriculture workforce assessment, are not robust. It is not possible for the WCA to reform the agriculture sector in general, including its substantial workforce development issues.

The WCA will seek to support improved credit because financing is a bottleneck to the sustainability of promoting new technologies. Sustainability was achieved in a previous USAID project that built the capacity of 177 local CBOs. The project proved the effectiveness and demand for various water-saving technologies and the willingness of households to repay revolving loans: 5,000 cisterns were constructed and revolving loan funds increased from about \$4.5 million to almost \$9 million (owing to the revolving nature of the loans) with a 94 percent overall repayment¹⁵.

To promote sustainability, WCA will explore how to develop new financial methods that can provide reasonable terms to those who want to access the technology and build on the demonstrations that the loans can be paid back during a reasonable period of time. WCA will focus on the technologies saving water that have proven to be commercially viable in other countries – like hydroponics. WCA will establish the payback periods for various technologies and use data to support the development of new commercial financing approaches. After economic viability of technologies is demonstrated the commercial banking sector will become comfortable with the new technology, especially in hydroponics, used for high value crops that will also save water.

It is important for the applicant(s) to review the experience of the CBIWDM and build on its successes (<https://usaidjordankmportal.com>). The project was designed with a central focus on sustainability of investments in recipient CBOs and their ability to successfully, transparently and efficiently manage their revolving funds. The activity is handing over the responsibilities of loans oversight to the MoSD. This measure is to ensure the sustainability and the continuity of the revolving loans program.

¹⁵ For the CBIWDM, seminal documents can be located on the USAID/Jordan portal (<https://usaidjordankmportal.com>). Applicants can either search for documents under "Collections" in a folder entitled "Water Conservation."