

2011

Water and Livelihoods Initiative (WLI) Second Quarter Progress Report



April – June
2011



Acronyms

AAAS: American Association for the Advancement of Science

AnC: Ain Chams University, Egypt

ARC: Agricultural Research Center

AREC: Agricultural Research and Education Center

AUB: American University of Beirut, Lebanon

AUC: American University in Cairo, Egypt

BU: Benha University, Egypt

CODIS: Communication, Documentation and Information Services (ICARDA)

CU: Cairo University, Egypt

CWANA: Central, West Asia and North Africa

GCSAR: General Commission for Scientific Agricultural Research, Syria

GIS: Geographic Information System

ICARDA: International Center for Agricultural Research in the Dry Areas

IFPRI: International Food Policy Research Institute

IIP: Irrigation Improvement Project

IYF: International Youth Foundation

IWMI: International Water Management Institute

JUST: Jordan University of Science and Technology

LARI: Lebanese Agricultural Research Institute

MEAS: Modernizing Extension and Advisory System

MENA: Middle East and North Africa

MEPI: Middle East Partnership Initiative

MOU: Memorandum of Understanding

NARS: National Agricultural Research Systems

NCARE: National Center for Agricultural Research and Extension

NWRC: National Water Research Center

QNFSP: Qatar National Food Security Program

SWAT: Soil and Water Assessment Tool

TAMU: Texas A&M University, USA

UC-D: University of California – Davis, USA

UF: University of Florida, USA

UI-UC: University of Illinois at Urbana-Champaign, USA

USAID: United States Agency for International Development

USU: Utah State University, USA

WLI: Water and Livelihoods Initiative

WNRDP: West Nubaria Rural Development Project

ZU: Zagazig University, Egypt

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Executive Summary

The second quarter of 2011 features a number of important events including the launching of the new website, the beginning of the summer student research and exchange program at the benchmark sites, increased collaboration with other programs and universities (U.S. and MEI), improved efforts to promote the initiative, and advanced activities at the benchmark sites. Some highlights of planned activities at the benchmark sites include collection of bio-physical and socio-economic data, and development of land suitability criteria.

WLI's partnering universities (U.S. based and regional), ICARDA, and IWMI played a significant role during the reporting period in launching the Student Exchange and Research Program by selecting students, identifying research topics, and by serving as advisors and co-advisors to selected student researchers. Moreover, the University of California –Davis (UC-Davis) took the lead in conducting the training on “Extension and Water Management” for rainfed agro-ecosystems. The University of Florida (UF) also played an important role in this quarter by taking the initiative to redesign the WLI website.

Capacity building was also given due attention during the reporting period. A specialized training on ‘GIS Applications’ was offered to the NARES at the beginning of the quarter. Trainees also benefited from a web-based closed group site that was especially set up for them to continue their discussions on the topic and learn from each other's experiences as they worked towards developing land suitability criteria for their respective benchmark sites.

Major challenges during the quarter relate to the current political situations in the region. The challenge was more magnified in Yemen and Syria where free movement to undertake planned activities was restricted. In the case of Yemen, all activities ceased after the seizure and destruction of the Elkod Research station on May 27, 2011.

Activities Undertaken in the Quarter

Activities at Benchmark Sites

Reports from the National Agriculture Research Systems (NARS) WLI partners indicate that activities at the benchmark sites were, more or less, executed as planned. Exceptions to these are Yemen and Syria where planned activities were disrupted due to political instability in these countries. Below are short synopses of the progresses made by each partnering country. Detailed information is provided under Annex I which offers a summary of all activities undertaken by the NARS during the reporting period.

Egypt: Program implementation, which was disrupted in the first quarter of 2011 was continued as planned during the reporting period. In this quarter, the bio-physical team in close collaboration with Dr. Atef Swelam (ICARDA, Egypt) set the parameters required to assess soil compaction and salinity build-up in Zankalon location (Old land), water table and salinity build-up in Al Bustan (New land), and salinity build-up in Al Hussainia location (Salt affected area). The assessment was conducted to determine the sustainability of the irrigation systems and their impact on water productivity, land use and rural livelihoods in the Nile Delta. On the other hand, the socio-economic team prepared a clear description of the sampling procedure following the suggestions made by Dr. Aden Aw Hassan, director of SEPRP, ICARDA. The team also finalized the questionnaire making sure that the data collected will reflect the unique features of each site and where possible be comparable among the three benchmark sites. Results of the survey will be used to generate a comprehensive document which will:

- Provide a diagnosis of the socio-economic situation and what is known so far from the problems of the three benchmark sites;
- Identify the main research questions which are common in all sites (water use efficiency, technology adoption, farmers perceptions of technologies, organizational issues such as water user associations); and the specific nature of each site such as salinity, different types of users with different socioeconomic circumstances, etc.;

- Outline The sampling strategy (the sampling population, the special stratification of the sample, weighting of the different strata); and
- Describe the research methods that will be applied with regards to socio-economic dimensions.

A training course for enumerators will be offered in the next quarter to ensure quality in data collection and entry. Other noteworthy achievements include the shift from using sprinklers to cultivate field crops and vegetables to using drip irrigation and cultivating fruit trees, which in turn reduce water use and the cost of irrigation thereby increasing farmers' incomes. It was also reported that the collaboration among WLI partners in Egypt including the Agricultural Research Center (ARC), the National Water Research Center (NWRC), the American University in Cairo (AUC), Zagazig University (ZU), Cairo University (CU), Ain Chams University (AnC) and Benha University (BU) has increased substantially.

Iraq: Following the design of the questionnaire in the previous quarter, the bio-physical and socio-economic team (including two women enumerators specifically recruited for this purpose) conducted field surveys and collected information on agricultural production (yield, water consumption, number of greenhouses, areas planted, crops planted, and yield generated) and other socio-economic indicators from about 500 farmers. The bio-physical team also

- developed land suitability criteria for both the rainfed and irrigated areas,
- identified a number of constraints affecting water productivity at the Abu Ghraib benchmark area, and
- made comparisons of different on-farm cropping systems, cultural practices and irrigation systems.

Among the constraints identified were – unequal distribution of water among farmers, over irrigation, shortage in irrigation water supply during the summer season which forces farmers to use saline drainage water and wells, and lack of proper maintenance of irrigation networks including main canals and branches. Findings of the comparisons made indicate that farmers mostly grow vegetables both in summer and winter, followed by forage crops (Alfalfa and Berseem), and field crops such as barley, wheat, corn and sorghum. It was also reported that sowing on plots and furrow using surface irrigation are dominantly practiced in the area. A few farmers have also started

applying sprinkler and drip irrigation. On the socio-economic front, the team has now completed entering the data collected from the field survey and are now in the process of analyzing the data.

Jordan: According to the reports received, number of activities were undertaken both under the bio-physical and socio-economic component. Achievements under the bio-physical component include the installation of wind erosion station, collection of data on vegetation coverage in the two benchmark sites, analysis of the chemical and physical properties of soil data collected from the weirs and geo-textiles station in the benchmark site of Majidiah, and the selection of a new site which could serve as a trial demonstration site for water harvesting techniques including contour lines, water reservoirs, check dams, and their dissemination to farmers selected in Al Mafraq area.

Activities under the socio-economic team mostly revolved around raising the awareness of the communities at the benchmark sites on income generating activities. The socio-economic team initially conducted an assessment of current income generating activities in the Muharib and Majidyya communities, on the basis of which it identified potential activities that could be beneficial to them. The team's efforts were complemented by Dr. Emilie Stander's visit from USAID (detailed below) and resulted in the drafting of a Middle East Partnership Initiative (MEPI) proposal which aims to promote the exchange of experiences among cooperatives in the area.

Lebanon: Following the GIS Specialized Training held in April, the bio-physical team developed suitability criteria for the rainfed and irrigated benchmark sites in the Orontes River Watershed. The bio-physical team also began collecting data for the El Qaa area, in the reporting period, and sent about 25 soil and water samples for laboratory analysis. Data collection on land cover types required to develop land cover maps is also underway. The bio-physical team plans to conduct a five-day local training on GIS (Beginning Level) for ten individuals from the Lebanese Agricultural Research Institute (LARI) in the next quarter.

Under the socio-economic component, the team mainly focused on filling the questionnaire which was developed in the previous quarter and reviewed by Dr. Samia Akroush (NCARE, Jordan) in June. Information was collected in Al-Qaa and Al Hermel regions with contributions from Mr. Eid Mattar from the office of Water Use and Distribution in Al Qaa region and Mr. Khoder Jaafar the Development and Cooperatives Department Manager in Al Hermel. The surveys

in both regions are expected to be completed by the end of July. The team plans to send two of its members to Jordan for training on data analysis sometime in September 2011.

Palestine: A number of activities were undertaken in the reporting period. Following the GIS Specialized training offered in April, the bio-physical team in close collaboration with the Land Research Center (LRC) and the Applied Research Institute – Jerusalem (ARIJ) worked towards collecting data, conducting biophysical analysis, and developing the criteria required for land suitability maps. To date the team has generated maps on Adh Dhahiriya's watershed, land use, land reform, slope, annual rainfall, and temperature conditions.

Under the socio-economic component, the team pre-tested the questionnaire designed during the first quarter of the year, and collected data from the benchmark sites of Tammun and Hebron. The data collection followed a short training offered by a local consultant on data entry and coding. The consultant also participated in the data collection process at the Hebron site to ensure the quality of data collected. The quarter also marked the beginning of the Summer Student Research program on watershed management. The research will be carried out by an MSc student from Berzeit University who was interested to work on a topic identified by WLI partners in Palestine.

Syria: during the reporting period, substantial progress was made on digitalizing maps and developing land suitability criteria for sprinkle, spate and drip irrigation. However, accomplishments under the socio-economic component were not as encouraging. The socio-economic team designed a rural survey questionnaire to assess the state of the population living in the project area including gender relations, landholdings and agronomic practices. The questionnaire was; however, not tested due to the recent political instability in the country which limited mobility. In the meantime, a workshop on conducting surveys and data collection is being organized and is expected to be held in the next quarter. The team is also working on setting up a site advisory group comprising of representatives from the various stakeholders in the project area. In addition to the GIS training which targeted all the NARS in the seven partnering countries, the Lebanese team also benefited from a training on "Extension and Irrigation" focusing on rain-fed agro-ecosystems (June 27-July 1, 2011). Moreover, the WLI appointed team in Syria met with representatives from ICARDA (Dr. Fadi Karam, Dr. Ahmad Hachum and Eng. Piere Hayek) on May 31, 2011 to design research topics for five Syrian graduate students who will be working at the

WLI benchmark sites as part of the summer student exchange program. The plan to have U.S. students involved in the research was abandoned following the political instability in the country. For more information on the topics and advisors identified, please refer to Annex II below.

Yemen: Planned activities, especially activities under the socio-economic component, were not executed as planned during the reporting period because of the political instability and ensuing insecurity in the country. However, some progresses were made under the bio-physical component including compiling data for the preparation of land-cover map such as (vegetation, water, valleys, canals, dams, fields, cities, roads, and mountains); conducting data analysis on soil and water samples collected in 2010; interpreting the updated soil and land suitability maps prepared during the first quarter of the year; and collecting water samples and information on depths of water wells in the Delta Abyan during the month of April. Two members of the WLI team were also able to benefit from the Specialized GIS training held in Amman, Jordan (April 10-14, 2011). All activities stopped after the seizure and destruction of the Elkod Research station on May 27, 2011.

Trainings:

GIS Training (April 10-14, 2011): A one-week specialized training on ‘GIS Applications in WLI Benchmark Sites’ was conducted at the National Center for Agricultural Research and Extension (NCARE) in Amman, Jordan. The training, which was a follow up to the ‘GIS Preparatory Course’ offered in Amman in January 2011, focused on building participants’ technical skills required to conduct advanced bio-physical characterization of benchmark sites. The training was given by Dr. Feras Ziadat from ICARDA, in close collaboration with NCARE.



The training was attended by two representatives from each WLI partnering country and Morocco, which is part of the Central, West Asia and North Africa (CWANA) Water Benchmarks Project. Trainees were exposed to both the theoretical and practical aspects of developing suitability criteria, conducting suitability analysis, creating suitability maps, and handling data scarcity.

Trainees were also encouraged to use data they collected from their respective benchmark sites to ensure adequate representation of the unique features of the three agro-ecosystems (rainfed, irrigated and rangeland).

Upon the completion of the training, trainees were tasked to develop suitability criteria for their respective benchmark sites by June 10 and to identify data gaps by July 10, 2011. An online thematic group site was created for the trainees under the



WLI/ICARDA group site portal to serve as a platform for collaboration where participants can discuss their findings and learn from each other. A follow up training will be scheduled depending on the progress made by trainees, and an assessment of their skill requirements. For additional information on the training, please refer to the detailed program under Annex III.

Training on Extension and Water Management (June 27 – July 1, 2011): as a follow up to Dr. Madden's scoping visits to the benchmark sites in Lebanon and Syria in February 2011, a one week training on extension and irrigation was organized and offered at the end of the quarter. The training, which is one of a series of trainings planned on the topic, focused on problems in the rainfed agro-ecosystems of Syria and Lebanon, and the appropriate extension methodologies that will improve the effectiveness of extension agents working with farmers practicing on-farm water management. The training targeted twelve mid-level extension specialists who are currently working with the WLI. Also in attendance were two summer exchange students from the university of UC-Davis and Utah State University (USU). The training, which was a combination of classroom and practical/field instruction, was offered by experts from UC-Davis, USU, and the American University of Beirut (AUB). The training was held at the Agricultural Research and Education Center (AREC) of the AUB, Haouch Sneid, Bekaa. For additional information on the training, please refer to the detailed program under Annex IV.

Mission Trips

Potential Middle East Partnership Initiative (MEPI) funding for Jordan (March 16-24): Dr. Emilie Stander, a Fellow of the American Association for the Advancement of Science (AAAS) Science and Technology Policy at USAID, visited WLI benchmark sites in Jordan to identify stakeholder groups and meet with women-led NGOs who could potentially benefit from the US Department of State's Middle East Partnership Initiative (MEPI) funding. The funding, if approved, will be used to build the capacity of the cooperatives at the benchmark sites of Muharib and Majedyia. Special emphasis will be given to the transfer of knowledge through peer-to-peer exchange of information. The Ngera cooperative, currently engaged in dairy activities, kindergarten, and computer learning centers, was identified as the ideal cooperative which could share its experiences with the cooperatives at Muharib and Majedyia.



Dr. Stander's visit was later followed by Dr. Fadi Karam (ICARDA), who visited the three cooperatives on April 12, 2011. During his visit, Dr. Karam met with representatives from the three cooperatives and Dr. Samia Akroosh - the socio-economic team leader for WLI/Jordan. The highlight of the meeting was a presentation by the president of the Ngera Cooperative who suggested that the cooperatives at Muharib and Majedyia focus on – modernizing their sheep milk collection system to ensure better milk yield to local industries, expand the existing cheese industry and associated storage facilities, and establish a computer center to improve the technical skills and potential employment opportunities of the youth people at the benchmark sites. The information was relayed to Dr. Stander who will incorporate it into the concept paper that is currently being developed by Eng. Samia Akroush from NCARE, and Dr. Nasri Haddad from ICARDA-Jordan, incorporating advice from Dr. Sarah Tully and Ken Ludwa from USAID/Washington. The paper will be submitted to MEPI's regional office and will be developed into a full proposal upon invitation from MEPI to do so. During her visit Dr. Stander also had the opportunity to explore potential collaborations between WLI and other organizations, including the USIAD Mission in Amman, Mercy Corps, and the International Youth Foundation (IYP). The ICARDA office in Amman and NCARE will be following up with these organizations.

Visit to the benchmark sites in Egypt (April 4-7, 2011): Dr. Fadi Karam and Dr. Francois Molle made a one-week trip (April 4-7, 2011) to Egypt to visit the three benchmark sites in the Nile Delta, to discuss with the WLI team on the ground about their accomplishments in 2010, and their plans for 2011, and the possibilities of having MSc students from the U.S. and Egypt conduct research at the benchmark sites during the summer. Dr. Karam and Dr. Molle were able to observe the field trials on irrigation management in the Al Bustan region within the New Land benchmark site, and the training facilities at the West Nubaria Rural Development Project (WNRDP). Dr. Karam and Dr. Molle also visited the Zankalon Research Station and the Extension Station at Diarb Negma to learn about on-going research programs and to have a better understanding of extension services offered to farmers in the area, especially with regards to the raised-bed technique that was largely adopted by Egyptian farmers as an improved technique for rice and vegetable production in the Nile Delta.



WLI/MEAS Scoping Mission in Egypt (May 2011): WLI, in collaboration with Modernizing Extension and Advisory Services (MEAS), USAID, and relevant Egyptian Offices, undertook a scoping mission in Upper Egypt to develop an institutional and programmatic overview of advisory services in the agricultural sector. Key stakeholders including national, provincial and local levels of government were also engaged to ensure ownership of proposed extension practices and their subsequent adoption at the national level. The mission primarily focused on identifying:

- the major gaps within the different extension/advisory service providers, including institutional capacity, human competency and policy limitations, and
- near and long-term measures that could increase the effectiveness and sustainability of the different extension service providers.

The mission is expected to generate information required by USAID/Egypt to plan its next agricultural development project. The findings will thus be shared with USAID/Egypt, giving the Mission the option to expand the scoping mission to the Nile Delta and/or implement recommended interventions in Upper Egypt.

Visit to TAMU (May 28 - 29, 2011): Dr. Theib Oweis visited Texas A&M University on the 28th and 29th of May. During his visit Dr. Oweis met with Dr. Bill Payne and Dr. Steve Whisenant, to discuss the possibilities of having students from TAMU conduct research at the WLI benchmark sites of Egypt and Jordan during the summer. Dr. Oweis also met with Dr. Srinivasan, the Director of Spatial Science Laboratory, who agreed to serve as co-advisor for Lubna Mahasneh, MSc student from Jordan, who will be working on Watershed Management Modelling using Soil and Water Assessment Tool (SWAT). Dr. Srinivasan is expected to travel to Jordan during the third week of July to visit the WLI benchmark sites, to meet with other members of the research committee from the Jordan University of Science and Technology (JUST), and to finalize the research proposal. During his visit, Dr. Srinivasan will also offer a one-week training to WLI partners on SWAT modeling.

Visit to the projects at Western Nubaria and Damanhour, Egypt (May 23-28, 2011): Dr. Francoise Molle made a short visit to Egypt to make preparations for the summer exchange students who will be working on the Western Nubaria and Damanhour projects. Dr. Molle's visit to the sites and extensive discussions he held with Dr. Atef Swelem and Dr. Mohammed El Fetyani (Ministry of Irrigation) resulted in changes to the originally proposed research topics. All the transport and accommodation arrangements for the students were also finalized during this visit.

Special roundtable and 'webinar' event on "Lessons Learned and New Directions for the WLI" – International Food Policy Research Institute (IFPRI), Washington, DC (June 8, 2011): At this roundtable, WLI partners had the opportunity to share experiences and lessons learned – looking at new directions, including the implications of current changes in the region on WLI programming. The presentations, also available at <http://www.icarda.org/WLI/reports.html#lessons> on the WLI website, were made by:

- Dr. Scott Christiansen, United States Agency for International Development (USAID): *Introduction and WLI Overview,*
- Dr. Mahmoud Solh, Director General of the International Center for Agricultural Research in Dry Areas (ICARDA): *WLI Milestones,*
- Dr. James Hill, University of California—Davis: *Local partnerships between the WLI and national research partners,*

- Dr. Sandra Russo, University of Florida: *US and Middle East university exchanges and collaboration*, and
- Jack Boyson, Programs Director, Eurasia and MENA Regional Groups, International Youth Foundation (IYF): *Promoting youth participation and entrepreneurship in the WLI*.

The panel concluded that the WLI is a “ready to use” regional platform that can supply a new generation of land and water users; field-tested agricultural S&T for development; and techniques to translate S&T innovations into jobs. Lessons centred on how the WLI assembled a functional organizational structure that includes NARS, universities, NGOs, International Organizations and donors.

Follow up visit to the benchmark sites in Jordan (June 11-13, 2011): Dr. Fadi Karam, who was travelling to Jordan for the Inception Workshop on Agricultural Development in Mountain Areas (IFAD/ICARDA), used the opportunity to meet with Dr. Yasser Mohawesh (WLI’s focal person in Jordan) as well as the bio-physical and socio-economic team leaders Eng. Safaa Mazahreh and Dr. Samia Akroush. During his visit Dr. Karam followed up on WLI activities at the benchmark sites of Muhareb and Majidieh, provided insights on potential contributions of the WLI team in Jordan to the formulation of the MEPI proposal for Nqera association, discussed reporting formats for the upcoming quarterly report, and reviewed, in close collaboration with Dr. Feras Ziadat, the research proposal of Eng. Lubna Mahasneh (NCARE) who will be working towards obtaining her MSc from Jordan University of Science & Technology (JUST) within the framework of the WLI.

Support for WLI’s socio-economic team in Egypt (June 13, 2011): Dr. Aden Aw Hassan, the Director of the Social, Economic, and Policy, Research Program (SEPRP) at ICARDA met with members of the socio-economic team working under the Water Benchmark Project (WBM) and WLI. The main outcomes of the meeting include - the decision to replace the El Boheya site by Zankalon site to help coordinate and standardize the survey required by both WLI and WBM; the agreement to conduct one survey for both WLI and WBM and analyze the questionnaire for both; assigning site responsibilities where the ARC group will be responsible for El Bustan Site, NWRC Group will be responsible for Zankalon Site, and Zagazig University Group will be responsible for El-Hussinia Site; and the re-estimation of the budget to accommodate the changes made. The

agreements reached at this meeting were finalized by another meeting held on the 7th of July and attended by socio-economic team members from WLI and WBM. Questions that are relevant to WLI, and probe into:

- existing water use technologies and land management practices in the three benchmark sites,
- existing interventions (technologies, institutions, and policies) that promote water use efficiency (economic, social, technical, and environmental) in the three benchmark sites, and
- existing income generating activities in the benchmark sites were added to the questionnaire as a direct result of the meeting. Moreover, it was agreed that Dr. Halah Bassiony should use gender equality analysis to determine the most critical gender issues in the area that require an in-depth research. The team is also expected to develop an analytical frame of the data to make the collection process more efficient.

USAID mission trip to Jordan (June 14 - 24, 2011): Dr. Sarah Tully along with Eng. Ken Ludwa visited and worked with ICARDA, NCARE and the USAID/Jordan mission. During this trip, they met with WLI partners from Jordan and Palestine, visited WLI benchmark sites and met farmers and community leaders, advised WLI/Jordan on completion of a Middle East Partnership Initiative (MEPI) Grant concept note and template for other WLI teams, designed a draft results framework for WLI/Jordan, discussed the International Youth Foundation (IYF) proposal with the WLI/Jordan and Palestine teams, filmed a success story video at the Jordan WLI benchmark site, and visited the USAID/Jordan mission to discuss the possibility of conducting an agriculture sector assessment with MEAS and to update the Mission on WLI activities.

USAID mission trip to Doha, Qatar (June 12 -14, 2011): Dr. Sarah Tully visited Qatar as part of a USAID team to begin implementation of a Memorandum of Understanding (MOU) on food security signed during the Amir's visit to Washington in April. Initial meetings were designed to enable USAID and the Qatar National Food Security Program (QNFSP) to identify areas of cooperation and to enable assembly of an appropriate steering committee to guide the MOU's implementation. As a platform for cooperation, Dr. Tully spoke about the WLI and QNFSP recognized the value of participating and supporting the WLI, the benefits of from knowledge sharing, and agreed to explore the possibility of supporting academic exchanges, sending M.A. students to work at demonstration sites in the region. Dr. Patrick Linke, QNFSP Chief Engineer

and founder of the Texas A&M University's Qatar Sustainable Water and Energy Utilization Initiative, agreed to serve as the primary point of contact for this activity.

Student research at the benchmark sites in Egypt, Lebanon and Jordan (Summer 2011): The launching of the student research program is among the highlights of activities achieved in the reporting period. To date, a total of five students from the U.S. (from UC-Davis, TAMU, USU, UI-UC, and JUST) and seven students from the MENA region (Egypt, Jordan, Lebanon, Palestine, Syria and Tunisia) have been selected to conduct their research at WLI's benchmark sites in Egypt, Jordan, Lebanon, Palestine and Syria. The initial plan to host American student researchers in all the WLI benchmark sites was abandoned due to the political unrest in some of the partnering countries. Therefore their involvement is now limited to the benchmark sites in Egypt, Jordan and Lebanon. The students stationed in Lebanon benefited from the training on 'Extension and Water Management focusing on rainfed agro-ecosystems' and a mentoring session that was held at the AREC/AUB on the 30th of July, 2011. The session, in addition to the students, was attended by Dr. Mac McKee (USU), Dr. Musa Nimah (AUB), Dr. Francois Molle (IWMI), Dr. Nicholas Madden (UC Davis), Dr. Mark Bell (UC Davis), Dr. Hassan Machlab (ICARDA), Dr. Fadi Karam (ICARDA), Rebekah Moses (MSs Student, UC-Davis) and Roula Bachour (Ph. D. Student, USU). The scope of the meeting was to discuss a series of subjects related to the students' research work at Lebanon's benchmark site during this summer period, among which the adaptations made to the scope of work (SOW) to better respond to the priorities and cross cuttings of the benchmark site. The participants agreed on the following immediate actions:

- The Lebanese Agricultural Research Institute (LARI) will provide information, help and guidance to the students during their stay in Lebanon, and ensure logistical and transportation facilities during the regular visits to the benchmark area in the northern Bekaa Valley for data collection and interviews with farmers;
- Spot motivated Lebanese students with English language fluency to work with the American students to liaise with local people in the benchmark area;
- Ensure a quality graduate thesis research for both MSc & PhD research topics. This requires not only data collection and interviews with farmers, but also more involvement of researchers from the WLI team and other partnering institutions at all stages of the research work;

- Ensure a WLI fund to support two-month training at the benchmark site in Lebanon for a MSc student from AUB, named Manal Arab, to work with Rebekah Moses, the MSc student from UC Davis, and assist the WLI research activities of this summer.

The research topics were formulated through a collaborative effort that involved ICARDA, IWMI, the NARS, as well as the students' advisors from their respective universities. Accommodations for the American students were arranged by ICARDA in close collaboration with the NARS and the national universities. Please refer to Annex VI for more information on the research topics, the benchmark sites selected and the advisors involved. The actual research is expected to begin by the beginning of July.

Communication

The communication highlight for this quarter is the launching of the new WLI website (<http://www.icarda.org/WLI/>). Designed by Union Design and Photo, contracted by the University of Florida, the site now serves as:

- a platform to update WLI partners about recent and upcoming events,
- a repository to essential documents and reports, and
- a gateway to promote and raise awareness about the Initiative.

Efforts to set up separate password accessible folders where sensitive documents can be stored and made available to selected individuals are also underway. WLI's Project Management Unit (PMU) is working with ICARDA's IT unit to set up such a folder. A link to the spatial location of WLI's partners as featured on "Google Map" will also be shortly added to the public website.

A proposal on the potential role of "Communication for Resource Mobilization" (Annex VII) and promotional materials such as **brochures**, and **posters** were also developed in the reporting period. The brochures and posters were shared with the NARES (with the exception of Yemen and Egypt) and ICARDA's regional offices for further distribution as part of the Initiative's awareness raising campaigns.

The possibility of using WLI's group site (available on ICARDA's portal) as an online space for collaboration was also explored during this quarter. A closed group site was specifically set up for WLI's GIS team to collaborate on their project to develop suitability criteria for their respective benchmark sites. A quick assessment of the use pattern indicates that the group site could potentially serve as a productive space for thematic based collaboration among WLI partners.

Upcoming Events

A training workshop on Soil and Water Assessment Tool (SWAT) Modelling, Amman, Jordan (July): WLI partners are expected to benefit from a one week training program on SWAT modelling which will be offered under the Central, and West Asian, and North African Countries (CWANA) Benchmark Project. The training will be given by Dr. R. Srinivasan, Director of Spatial Science Laboratory from Texas A&M University (TAMU). Plans are also underway to work on a proposal on using SWAT for the assessment of water resources in the Middle East and the impact

of climate change on these resources. The proposal will be a joint effort between Dr. Srinivasan, Dr Karin Abbaspour from Switzerland and the WLI Project Management Unit at ICARDA.

Jordan MEAS scoping mission: WLI will be collaborating with Modernizing Extension and Advisory Services (MEAS), TAMU and USAID to conduct a country wide agricultural assessment in Jordan covering both the highlands and the Jordan Valley. The scoping mission is expected to be funded by USAID/Amman and aims to determine possible actions to increase agricultural incomes of the rural poor that are compatible with a net reduction of water use; rank proposed interventions by potential impact and feasibility; and recommend how the government of Jordan, USAID and/or other donors could best support such programs.

Annex I: Summary of Activities undertaken by WLI Partners

Egypt

Component	Objective	Activities	Outputs	Code	Responsibility		Time line												Due time	Indicator of achievement	Constraints and Risks	Progress		
					Lead organisation	Person in charge	2011															Stat us*	Reason	Notes
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						
Bio-physical	<p>Determine the sustainable water and integrated water, land use, and livelihood in the Nile Delta sub-sites for scaling-up</p> <p>Assess the effect of water table fluctuations and salinity build-up on the sustainability of the irrigation system</p> <p>Determine the impact of water-saving practices (pressurized irrigation systems, irrigation scheduling...etc) on the sustainability of the irrigation system, and water productivity</p> <p>Present some salinity control practices, traditionally applied</p> <p>Present other salinity control practices that could be applied at the study conditions</p>	Assess the sustainability of the irrigation system, and its impact on water productivity and rural livelihoods, on the basis of the following parameters	Final report on previous projects related to irrigation development in the three locations developed	Activity 1-BP	IWMR/ NWRC														Dec-11					
		Soil compaction and salinity build-up in Zankalon location (Old land)	Base-line for an integrated water and land-use strategy for sustainable benchmark management developed	Activity 1.1-BP	IWMR/ NWRC															Dec-11				
		Water table and salinity build-up in Al Bustan location (New land)	Feedback analysis for commonly-used agriculture and irrigation practices completed	Activity 1.2-BP	SWER/ ARC															Dec-11				
		Salinity build-up in Al Hussainia location (Salt-affected land)	Potentials of applying improved water-management practices, and their impact on water productivity identified	Activity 1.3-BP	SWER/ ARC															Dec-11				
Socioeconomic	<p>Assess the effects of utilizing sustainable water use technologies and land management practices on improving rural livelihoods of farmers in the three benchmark sites.</p> <p>Develop a short list of the best water-saving techniques accepted and adopted by households in all the benchmark sites</p> <p>Identify potential options/interventions (technologies, institutions, policies) for enhancing water use efficiency (economic, social, technical and environmental)</p>	Assess the impact of utilizing sustainable water use technologies and land management practices on improving rural livelihoods of farmers in the three benchmark sites	Rural livelihoods of farmers in the Nile Delta sub-sites are improved (through the adoption of sustainable land and water management practices and livelihood strategies)	Activity 1-SE	ARC/AERI													Dec-11						
		Identify potential options/interventions (technologies, institutions, policies) for water use efficiency (economic, social, technical and environmental)	A short list of the best water-saving techniques accepted and adopted by households in the three benchmark sites developed	Activity 2-SE	ARC/AERI														Dec-11					
		Assess existing income-generating activities in the three benchmark sites and identify potential income-generating activities	A short list of the existing income generating activities in the three benchmark developed	Activity 3-SE	ARC/AERI														Dec-11					

Water and Livelihoods Initiative (WLI) Second Quarter Progress Report 2011

Annex I: Summary of Activities undertaken by WLI Partners (Continued...)

Iraq

Component	Objective	Activities	Outputs	Code	Responsibility		Timeline												Indicator of Achievement	Constraints and Risks	Progress				
					Lead organisation	Person in charge	2011														Status	Reason	Notes		
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						Due time	
Biophysical	Assess and improve water productivity	Identification of key indicators of water productivity assessment (bio-physical, economic & social)	Indicators of water productivity assessment (bio-physical, economic & social) identified	Activity 1-BP	SBAR	Dr. Raad Omar Salih Dr. Ahmed Al-Falahi Dr. Kasim Ahmed Saleem Dr. Abdulkhalik S. Neema Mr. Ibraheem Lafta Jead														Oct-11	Yield Water consumption	None	In progress		Information was obtained from farmers and the concerned institutions throughout surveys to relate the levels of crop production to the amount of water used in agriculture
		Identification of key constraints in water productivity that should be addressed through interventions	Key constraints for low water productivity identified	Activity 2-BP	SBAR	Dr. Raad Omar Salih Dr. Ahmed Al-Falahi Dr. Kasim Ahmed Saleem Dr. Abdulkhalik S. Neema Mr. Ibraheem Lafta Jead														Oct-11		None	In progress		The problems and constraints faced by the farmers at the benchmark site were assessed by the WLI team during the different field surveys, among which the following constraints were identified: (i) unequal distribution of water among farmers, (ii) over irrigation, (iii) shortage in irrigation water supply during the summer season, which forces farmers to use saline drainage water and pumped groundwater, and (iv) lack of proper maintenance of the irrigation networks, including main and secondary canals
		Comparison of different on-farm cropping systems, cultural practices, irrigation techniques, etc	Different on-farm cropping systems, cultural practices, and irrigation techniques compared	Activity 3-BP	SBAR	Dr. Raad Omar Salih Dr. Ahmed Al-Falahi Dr. Kasim Ahmed Saleem Dr. Abdulkhalik S. Neema Mr. Ibraheem Lafta Jead															Oct-11	Planted areas Crops planted Irrigation system used	None	In progress	
Socioeconomic	Assess community constraints and needs as it relates to land and water resources and their impacts on livelihood	Conduct a socio-economic study on a representative sample	Cropping patterns & contributions of members of the households to agricultural activities analyzed Livelihood options in the study area identified Contribution of agriculture to households' income analyzed Formal and informal institutions dealing with livelihood and water management identified, and their contribution to livelihood analyzed Farmers' perceptions of water management analyzed Constraints faced by farmers in livelihood development and farm management identified	Activity 1-SE	SBAR	Mr. Muhammad M. Abdullah Dr. Saad Hatim Mohammed Dr. Ahmed Al-Falahi Dr. Raad Omar Salih Dr. Kasim Ahmed Saleem Mrs. Sahar Ali Nasr														Oct-11	Yield generated income	None	In progress		Field visits were achieved to targeted farmers to collect socio-economic data. The team has completed data entering of the data collected from the field surveys and analysis process starts
							Report writing	Activity 2-SE	SBAR																

Water and Livelihoods Initiative (WLI) Second Quarter Progress Report 2011

Annex I: Summary of Activities undertaken by WLI Partners (Continued...)

Jordan

Component	Objective	Activities	Outputs	Code	Responsibility		Timeline												Indicator of Achievement	Constraints and Risks	Progress								
					Lead organisation	Person in charge	2011														Status*	Reason	Notes						
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec											
Bio-physical	Evaluate the implications of water harvesting techniques on bio-physical processes via modeling and dissemination activities	Data collection (water flow and level, run-off and sediments) for modeling using SWAT	Inputs parameters for SWAT model measured and used in research	Activity 1-BP	NCARE	Nabil B. Hani															Dec-11	Regular visits to the site & data collection	Data logger used for data collect & storage needs calibration for more accuracy	In progress		Data collection from the weir station in the benchmark site of Majdiah is taking place regularly after each rain event. During the 2nd quarter of the year (April-June) no rain occurrence was registered, but other data measurement was made on soil & sediment samples			
		Select a new site for developing guidelines & implementing demonstration trials on water harvesting techniques & dissemination to farmers	Implications of water harvesting techniques on bio-physical processes and socio-economic conditions evaluated	Activity 2-BP	NCARE																	Dec-11	Setting up site selection criteria with the local community	None to report	In progress		A new site for implementing demonstration trials on water harvesting techniques & dissemination to farmers was selected in Al Malfaq area. A series of meetings was made with the farmers to design the activities to be conducted at the site with relation to water harvesting techniques (contour lines, water reservoirs, check dam, etc) and proper land use.		
Socio-economic	Raise the awareness of local communities on the role of income generating activities for poverty reduction and development	Assessment of potential income generating activities for target communities in the benchmark (Mhareb, Majdiah and Nqera)	Potential income generating activities identified Income generating options introduced in the communities	Activity 1-SE	NCARE	Samia Akrouh															Dec-11								
		Conduct community meetings to identify potential income generating activities		Activity 1.1-SE	NCARE	Samia Akrouh																	Feb-11 & Dec-11	Regular meetings with communities at the benchmark to identify income generating activities	None to report	In progress		Several meetings with the communities were conducted in Muhareb & Majdiah sites in the Badiya. An assessment of the current income generating activities & potential ones was done through a prepared check list of the different possible income generating activities. The interviewees with women groups in the two sites made it possible responding to the questions in the check list	
		Exchange experiences with other communities in the benchmark (Nqera)		Activity 1.2-SE	NCARE	Samia Akrouh																	Mar-11 & Dec-11	Regular meetings with Nqera cooperative	None to report	In progress		Following the meetings with the local communities at the two sites conducted through activity 1.1-SE, it was concluded that the Association of Nqera was one of the local communities to have the potential income generating activities (Dairy industry, computer training center for youth people), and was considered as focal point for exchange experiences for the communities at the benchmark sites	
		Integration of gender dimension in local NGO's activities for women skills improvement in the benchmark		Activity 2-SE	NCARE	Nadera Al Jawhari																		Dec-11					
		Meetings with households in the targeted local communities		Activity 2.1-SE	NCARE																			Apr-11 & Dec-11					
		Household questionnaire		Activity 2.2-SE	NCARE																			Mar-11					

Water and Livelihoods Initiative (WLI) Second Quarter Progress Report 2011

Annex I: Summary of Activities undertaken by WLI Partners (Continued...)

Lebanon

Component	Objective	Activities	Outputs	Code	Responsibility		Timeline												Indicator of Achievement	Constraints and Risks	Progress						
					Lead organisation	Person in charge	2011														Status	Reason	Notes				
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						Due time			
Bio-physical	Provide complete soil, water, land & climate characterization in Hermel & El-Qaa benchmark sites	Design a questionnaire for bio-physical data collection using the same questionnaire form for socio-economic surveys	Questionnaire for field surveys completed	Activity 1-BP	LARI															Apr-11	Regular visits to the site and data collection	Data logger needs calibration for more accuracy	In progress		Data collection from the weir station in the benchmark site of Majdiah is taking place regularly after each rain event. During the 2nd quarter of the year (April-June) no rain occurrence was registered, but other data measurement was made (soil & sediment samples)		
		Field surveys & data collection at the two benchmark sites (Hermel and El-Qaa) on (i) existing surface water resources, (b) groundwater/wells pollution, (iii) existing irrigation practices and (iv) water use and consumption by different sectors	The required bio-physical data from Hermel and El-Qaa collected for further analysis	Activity 2-BP	LARI																Jul-11	Site selection criteria were set up in accordance with the local community	None to report	In progress		A new site for implementing demonstration trials on water harvesting techniques & dissemination to farmers was selected in Al Mafrag area. A series of meetings was made with the farmers to design the activities to be conducted at the site with relation to water harvesting techniques (contour lines, water reservoirs, check dam, etc) and proper land use.	
		Climatic data collection and GIS layering	GIS Layers (1/50000) of climatic parameters in the watershed produced	Activity 3-BP	LARI																Aug-11						
		Digitization, mapping & harmonization of the collected data	GIS layers (1/50000) of the watershed produced. GIS layers of the watershed harmonised between Syria and Lebanon	Activity 4-BP	LARI																	Aug-11	Meetings with communities at the benchmark to identify income generating activities	None to report	In progress		Several meetings with the communities were conducted in Muhareb & Majdiah sites. An assessment of the current income generating activities & potential ones was done through a prepared check list of the different possible income generating activities. The interviews with women groups in the two sites made it possible responding to the questions in the check list
		Updating of land cover data using remote sensing and monitoring variations in land cover over the past 10 years	Land cover map updated Land cover change analysis for the last 10 years available	Activity 5-BP	LARI																	Aug-11		None to report	In progress		Following the meetings with the local communities at the two sites conducted through activity 1.1-SE, it was concluded that the Association of Ngera was one of the local communities to have the potential income generating activities (Dairy industry, computer training center for youth people), and was considered as focal point for exchange experiences for the communities at the benchmark sites
Socio-economic	Provide adequate characterization of the social and economic status in Hermel and Al-Qaa target sites and link them with the data generated from the biophysical characterization	Finalize a questionnaire on household assets, women's involvement in farm and income generation, land ownership, farm practices and production systems, labor source, other income sources, existing marketing channels and constraints facing farmers	Questionnaire completed for field surveys	Activity 1-SE	LARI															Apr-11			In progress		The questionnaire was developed by the socio-economic team and was sent to Dr. Samia Akroush (Jordan) for a last check before use		
		Survey and data collection on the two benchmark site (Hermel-EI Qaa).	Required socio-economic data collected for further analysis	Activity 2-SE	LARI																Jul-11			In progress		Information was collected in Al-Qaa and Al Hermel site with contributions from Mr. Eid Mattar from the office of Water Use and Distribution in Al Qaa region and Mr. Khoder Jafar, the Development and Cooperatives Department Manager in Al Hermel. The surveys in both sites are expected to be completed by the end of July 2011	
		Database generation and statistical analysis	Socio-economic and bio-physical characteristics in the benchmark sites of Hermel & El-Qaa identified	Activity 3-SE	LARI																Oct-11			In progress (overdue)	Feedbacks and inputs on the questionnaire are needed from the gender research group at ICARDA		

Water and Livelihoods Initiative (WLI) Second Quarter Progress Report 2011

Annex I: Summary of Activities undertaken by WLI Partners (Continued...)

Palestine

Component	Objective	Activities	Outputs	Code	Responsibility		Timeline												Indicator of Achievement	Constraints and Risks	Progress		
					Lead organisation	Person in charge	2011														Status	Reason	Notes
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
Bio-physical	Assess the potential for improved land and water management interventions	Conduct suitability analysis	Suitability maps produced	Activity 1-BP	LRC		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Dec-11	Criteria for land suitability maps	None	In progress	The bio-physical team, in close collaboration with the Land Research Center (LRC) and the Applied Research Institute – Jerusalem (ARIJ), worked together for the collect and analysis of bio-physical data, and for the development of criteria required for land suitability maps. The team has generated maps on Adh Dhahiriya's watershed, land use, land reform, slop, annual rainfall, and temperature conditions
		Develop a database	Database developed using GIS software interfaces	Activity 2-BP	ARU Nader Hrimat														Dec-11	Use of GIS software	None	In progress	A number of activities were undertaken in the second quarter of the year, among which a GIS specialized training in April. The scope of the training was to train the WLI team on database development using GIS software interfaces
Socio-economic	Assess community constraints and needs as it relates to land and water resources and their impacts on livelihood	Conduct household survey and data collection	Household survey completed Livelihoods' assets in the benchmark sites identified	Activity 1-SE	NARC Nasser Sholi		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Apr-11	Number of interviews with households at the two benchmark sites	None	In progress	The socio-economic team pre-tested the questionnaire designed during the first quarter of the year, and collected data from the benchmark sites of Tammun and Hebron
		Enter the data collected	Data collection and entry	Activity 2-SE	NARC Nasser Sholi														Jun-11	Team trained in data collection and entry	None	In progress	The data collection followed a short training offered by a local consultant on data entry and coding. The consultant also participated in the data collection process at the Hebron site to ensure the quality of data collected
		Conduct data analysis	Data analysed - Recommendations to improve livelihoods	Activity 3-SE	NARC Nasser Sholi														Aug-11		None	In progress	Data analysis procedure is expected to underway in the 3rd quarter of year 2011

Annex I: Summary of Activities undertaken by WLI Partners (Continued...)

Syria

Component	Objective	Activities	Outputs	Code	Responsibility		Timeline												Indicator of achievement	Constraints and Risks	Progress					
					Lead organisation	Person in charge	2011														Status	Reason	Notes			
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						Due time		
Bio-physical	Promote better management of soil, water and cropping systems	Complete bio-physical characterization of the Al-Ghab benchmark site (maps' digitalization, database, etc...)	Digitized maps completed Database developed Full report on bio-physical characterization of the Al-Ghab region	Activity 1-BP	GCSAR	Awadis Anslan														Dec-11	Criteria of land suitability	None	In progress		Substantial progress was made on maps' digitizing and land suitability criteria development for sprinkler, spate and drip irrigation	
		Conduct water accounting for the Orontes Basin (at research plan)	Water balance at the basin level estimated (using WMI methodology) Depleted water fractions in the basin calculated Water accounting in the Orontes basin produced Information on water quantity and quality in the basin	Activity 2-BP	GCSAR	Boshra Khozarn															Dec-11	PHD potential students	None	In progress		A scope of work (SOW) on water accounting in the lower Orontes basin was prepared in close consultation with the WMI/CARDA team. The SOW was revised and commented by GCSAR for further dispatch among potential candidates
		Improve water and fertilizers' productivity of some strategic crops in the Al Ghab region (at research plan)	Irrigation scheduling for some strategic crops (cotton, corn, sorghum) in the Al Ghab region developed Fertilization calendar of the selected strategic crops developed Knowledge on water and nutrients' requirements of the crops improved	Activity 3-BP	GCSAR	Wasim Adla															Dec-11	Field experiments	None	In progress		Conducting a research in the Al-Ghab benchmark area on the 'Effect of green manure and nitrogen-based fertilization on the yield of Cotton crop in Al-Ghab plain soil'. The research is being conducted at Al-Ghab Research Center of the GCSAR during the period of 2010-2012. The study aims at characterizing the benefits from the nitrogen-legume fertilization source to reduce the inorganic nitrogen-based fertilization due to its negative impact on the environment and groundwater by using nitrogen fertilization from two sources: (i) mineral (urea) and (ii) organic (green manure with 4 legume crops: Faba Bean, Vetch, Pease, and a mixture of Barley and Vetch) to increase the yield and some yield components of cotton crop.
Socio-economic	Determine the current situation of the of the livelihoods in benchmark site of Al-Ghab Collection of socio-economic primary data through field surveys and analysis of the collected data	Questionnaire to conduct field surveys designed Questionnaire tested and trialled Socio-economic data collected Collected data analysed and final report on the situation of the livelihoods in the benchmark site produced	Activity 1-SE	GCSAR	Moamar Dayoub																	None	In progress		The questionnaire was prepared in English and translated to Arabic	
		Design of the questionnaire	Activity 1.1-SE	GCSAR	Moamar Dayoub																Mar-11	Questionnaire designed and trialled	None	Completed		The socio-economic team designed a socio-economic questionnaire for field surveys to assess livelihoods in the project. The questionnaire includes gender indexes, land tenure and agronomic practices
		Trialling of the questionnaire	Activity 1.2-SE	GCSAR	Moamar Dayoub																Apr-11	Questionnaire designed and trialled	None	Completed		The questionnaire was trialled on a sample of farmers in the Al-Ghab region. The socio-economic team introduced the necessary improvements that came out after the trialling phase of the questionnaire
		Field surveys, data collection and data entry	Activity 1.3-SE	GCSAR	Moamar Dayoub																Jul-11		None	In progress (overdue)		Field surveys, data collection and data entry were not achieved in time, as outlined in the work plan, because of the unrest in the country, which restricted travels to the Al-Ghab region
		Data analysis	Activity 1.4-SE	GCSAR	Moamar Dayoub																Sep-11		None	Not started		
		Final report on the livelihoods' situation in the benchmark	Activity 1.5-SE	GCSAR	Moamar Dayoub																Dec-11		None	Not started		

Annex I: Summary of Activities undertaken by WLI Partners (Continued...)

Yemen

Component	Objectives	Activities	Outputs	Code	Responsibility		Timeline												Indicator of Achievement	Constraints and Risks	Progress			
					Lead organisation	Person in charge	2011														Status	Reason	Notes	
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						
Bio-physical	Establish digital database for Delta Abyan Monitor and assess water resources and their use Understand pathways of waste/treated water in the study area	Update existing digital database for the area	Land cover map Updated soil map Updated suitability map	Activity 1-BP	AREA, NWAR													Jul-11			In progress		Data compilation for the preparation of land-cover map, including, vegetation cover, water, valleys, canals, dams, fields, cities, roads, and mountains. Conducting data analysis on soil and water samples collected in 2010 and interpretation of the updated soil and land suitability maps prepared during the first quarter of the year; and collecting water samples and information on depths of water wells in the Delta Abyan during the month of April	
		Assess water productivity in spate irrigation and ground water use	Report on monitoring ground water wells for both level and quality Methodology for assessment of water productivity developed Water productivity for spate and ground water irrigation assessed	Activity 2-BP	AREA, NWAR														Oct-11			In progress (overdue)	Some activities under the bio-physical component during this reporting period were not achieved as planned earlier in the work plan because of the political instability in the country	
		Assess the role of spate irrigation in ground water recharge	Contribution of spate irrigation to ground water recharge assessed	Activity 3-BP	AREA, NWAR															Oct-11			In progress (overdue)	Some activities under the bio-physical component during this reporting period were not achieved as planned earlier in the work plan because of the political instability in the country
Socio-economic	Assess role and effectiveness of associations in natural Resource Management and community support Assess impact of water productivity on livelihoods	Conduct an initial assessment of the impact of water productivity on livelihoods	Active stakeholders identified Methodology of the impact assessment developed	Activity 1-SE	NWAR																		Activities under the socio-economic component during this reporting period were not achieved as planned earlier in the work plan because of the political instability in the country	
		Assess the role of water users and other multi-purpose associations in managing agro-ecosystems (including water & land degradation)	Report on the role of water user associations in water management Report on the role of multi-purpose cooperative associations in enhancing agro-ecosystems management	Activity 2-SE	AREA																			Activities under the socio-economic component during this reporting period were not achieved as planned earlier in the work plan because of the political instability in the country
		Assess indigenous knowledge and social norms in management of agro-ecosystems	Indigenous knowledge and social norms in management of agro-ecosystems assessed	Activity 3-SE	AREA																			Activities under the socio-economic component during this reporting period were not achieved as planned earlier in the work plan because of the political instability in the country

Annex II: Proposed WLI Supported Student Research Program in Syria

Student name	Expected Degree	Research Topic	Supervisors	Proposed Research Station
Tammam Yaghi	Ph. D	Water Accounting of the Downstream Orontes Basin	Primary advisor: To be decided (University) Co-advisor: Dr Boshra Khozam (GCSAR) Co-advisor: Dr Francois Molle (IWMI)	Al-Ghab Valley
Aiham Jbaro	Ph. D	Water Productivity of some Irrigated Crops in the Al Ghab region	Primary advisor: To be decided (University) Co-advisor: Dr Ahmad Hachum (ICARDA) Co-advisor: Dr. Awadis Arslan	Almuktaria Station in Homs Province, Homs Center, GCSAR
Mohammed Shibli	M. Sc.	Deficit Irrigation/Cotton Crop	Primary advisor: To be decided (University of Aleppo) Co-advisor: Dr Fadi Karam (ICARDA)	Surbaya Station in Aleppo Province, Aleppo Center, GCSAR
Darin Al Assad	M. Sc.	Deficit irrigation/Corn	Primary advisor: To be decided (University) Co-advisor: Dr Boshra Khozam (GCSAR)	Almuktaria Station in Homs Province, Homs Center, GCSAR
Wassim Adli*	Ph. D	The effect of mineral and organic N (green manure) on some physical and chemical properties of soil on yield and quality of cotton (SN 124) under Al-Ghab valley conditions	Primary advisor: Dr. Abdulkhani Khorsheed (Aleppo University) Co-supervisor: Dr Awadis Arslan (GCSAR)	Al-Ghab Station in Hama Province, Al-Ghab Center, GCSAR
* Wassim Adli is expected to finish the second year experiments in September 2011				

Annex III: Specialized Training on GIS



Specialized Training Workshop on 'GIS Applications in the WLI Benchmark Sites'

Course content

Capacity Development Unit (CDU)
(NCARE, Amman, Jordan, 10-14 April, 2011)

Introduction

The Middle East Water and Livelihoods Initiative (WLI) is a USAID-funded partnership combining the resources and expertise at national, regional, and international agricultural research institutions and universities in the MENA region and the United States. Its goal is to improve the livelihoods of rural households and communities in areas where water scarcity, land degradation, water quality deterioration, food security and health problems are prevalent. Activities include the introduction of new income-generating crop and livestock strategies in the context of sustainable and appropriate production technologies, market chain development and promoting strong farmer-based organizations. WLI partner countries include Egypt, Iraq, Jordan, Lebanon, Palestine, Syria, and Yemen.

GIS techniques provide the opportunities to better characterize a benchmark site with respect to biophysical properties. This will help in improving the knowledge of the ecosystem functions, and also form a basis of formulating the appropriate production management strategies. The five-day training is a kind of 'On-The-Job-Training', where trainees will be asked to bring their own data from the respective sites for further processing using GIS software. Therefore, a good practical knowledge of GIS, good knowledge of the WLI goals and objectives (for each benchmark site) and data and layers that cover the benchmark site are prerequisite to assure the success of this training.

Purpose

- To assure technical preparations in GIS for the WLI resource teams for advanced bio-physical characterization of the benchmarks.

Targeted audience

- Mid-level engineers and technicians using GIS techniques. Two candidates from the bio-physical team of the WLI team in the seven participating countries with current or near-future opportunities to work with GIS in the benchmark sites are encouraged.

Expected outputs

- 10-12 researchers trained on GIS applications in the benchmark sites;
- Bio-physical research plans modified to integrate GIS applications at the benchmarks.

Expected outcomes

- Establish a GIS/bio-physical team to share learning between ICARDA and NCARE and other institutions with GIS applications;
- Integration of GIS/bio-physical related activities in future research of trainees and participating institutions;
- More researchers to have access to GIS learning through distributed e-learning.

Duration: One week (10-14 April, 2011)

Venue: National Center for Agricultural Research & Extension (NCARE), Amman, Jordan.

Number of hours: 35, including exercises

Learning material provided: Training manual, presentations, handouts

Funding Sources: The Middle East Water and Livelihoods Initiative (WLI)

Training team

Dr. Feras Ziadat, IWLMP/ICARDA

Eng. Safa Mazahreh, NCARE, Jordan

Eng. Lubna Al-Mahasneh, NCARE, Jordan

About ICARDA

Established in 1977, the International Center for Agricultural Research in the Dry Areas (ICARDA) is governed by an independent Board of Trustees. Based in Aleppo, Syria, it is one of 15 centers supported by the Consultative Group on International Agricultural Research (CGIAR). ICARDA serves the dry areas of the developing world for the improvement of natural resource management and the development of adapted barley, wheat, lentil, chickpea, and faba bean varieties. ICARDA's research provides global benefits of poverty alleviation through productivity improvements integrated with sustainable natural-resource management practices. ICARDA meets this challenge through research, training, and dissemination of information in partnership with the national agricultural research and development systems. The results of research are transferred through ICARDA's cooperation with national and regional research institutions, with universities and ministries of agriculture, and through the technical assistance and training that the Center provides. A range of training programs is offered extending from residential courses for groups to advanced research opportunities for individuals. These efforts are supported by seminars, publications, and specialized information services.

Annex IV: Training on Extension and Water Management, focusing on rainfed agro-ecosystems



WLI Extension and Water Management Training Workshop with a focus on rainfed areas

**June 27th to June 30th, 2011
AREC/AUB, Lebanon**

Background

The goal of the Water and livelihoods Initiative (WLI) is to improve the livelihoods of rural households and communities in areas where water scarcity, land degradation, water quality deterioration, food security and health problems are prevalent in the seven participating countries of the Middle East (Egypt, Iraq, Jordan, Lebanon, Palestine, Syria, Yemen), focusing initially on specific benchmark sites. Within the frame of the WLI, UC Davis and ICARDA aim at organizing a series of workshops to help strengthen the extension and water management capabilities of extension agents working in the benchmark sites of the WLI partner countries. The first of these workshops is proposed to be held in the Lebanon to focus on problems in the rainfed agro-ecosystems of Syria and Lebanon.

Proposed Workshop

Purpose

To train key extension agents in the WLI benchmark sites of Syria and Lebanon in appropriate extension methodologies to improve their effectiveness in working with farmers in on-farm water management.

Content

Areas to be covered include water management in the rainfed benchmark areas and the essential element of extension: Audience and needs, Solutions, Core Message, Packaging and Delivering the Message, and Evaluations.

Objectives

- Describe modern on-farm water management appropriate for rain-fed systems
- Develop an appropriate extension framework
- Increase awareness of participatory extension methods and developing farmer surveys
- Improve ability to distil and deliver information to target groups
- Develop an action plan for conducting a workshop for farmers with limited resources

Outcomes

- Better understanding of on-farm water management needs and solutions
- User-friendly extension material developed
- A working agenda for a future workshop

- Better communication with farmers, researchers, and policy-makers
- More efficiency in working with limited resources

Target group

Twelve extension professionals (specialists) from Lebanon and Syria:

- Mid-level extension agents with interest/experience in training
- Men and women from each benchmark site
- An employee of their country's Extension Dept/Program/Directorate
- Aware of, and involved in WLI activities in the region
- Has opportunity to organize and run a workshop upon return to the benchmark site
- Speaks and understands English

Resource team

Key resource people Primary focus Institute Contact

Dr. Mac McKee Irrigation/General, Facilitator, Utah State University, mac.mckee@usu.edu

Dr. Mark Bell Extension UC Davis mark.andrew.bell@gmail.com

Dr. Nicholaus Madden Extension/General, Facilitator, UC Davis nmmadden@ucdavis.edu

Dr. Musa Nimah Water and Soil AUB musanimah@gmail.com

Dr. Nadim Farajallah Hydrology and Water Resources, AUB nf06@aub.edu.lb

Miss Roula Bachour Student/Irrigation Utah State University, roula.bachour@aggiemail.usu.edu

Miss Rebekah Moses Student/Extension UC Davis rmoses@ucdavis.edu

Key support people Institute Contact

Dr. Hassan Machlab ICARDA h.machlab@cgiar.org

Dr. Fadi Karam ICARDA F.Karam@cgiar.org

Dr. Francois Molle IWMI francois.molle@ird.fr

Materials and methods

Presentations (PowerPoint), handouts, whiteboards, flip charts, post-its, marker pens, multimedia projector, laptop, field trips. Language of instruction: primarily English

Logistics

The workshop will be held at the Agricultural Research and Education Center (AREC), AUB American University of Beirut, Lebanon. The AREC is located at Haouch - Sneid in the Central Bekaa Valley, situated between Mount Lebanon and the Anti-Lebanon Range; 80 km from Beirut. It includes a 100-hectare research farm, an agricultural library, a clinic, several staff resident houses, a student cafeteria and dormitories, classrooms, and laboratories. The farm provides excellent opportunities for visitors to obtain practical experience in various sectors of agriculture. Accommodations will be at the Agricultural Research and Education Center (AREC), AUB (American University of Beirut), Lebanon.

Dates and time

June 27th to June 30th, 2011 (3 days classroom + 1 day field trip to Bekaa Valley)

Contact

For additional information, please contact Dr. Fadi Karam (F.Karam@cgiar.org), Dr. Nicholas Madden (nmmadden@ucdavis.edu), or Mark Bell (mozbell@ucdavis.edu).

Annex V: Summary of Summer 2011 Student Exchange Program

Egypt				
Research Topic	Goal/Objective	Students	Advisor	Co-advisors
Intensification of Agriculture and Water Management in Western Nubaria Project	Analyse the spatial diversity of cropping patterns and their main determinants regarding constraints linked to water delivery and farming system, to assess ways of further increasing water productivity at the plot and project levels.	Jessica Sharkey, MSc, UC-Davis	Dr. Nicholas Madden, UC-Davis	Dr. Iaa Al-Ansary (MoA/ARC), Dr. Atef Swelam (NWRC), and Dr. Francois Molle (IWMI)
Assessing Changes in Water Management Practices After Implementation of the Irrigation Improvement Project (IIP) in, Damanhour	Analyse and compare actual management practices in two irrigated areas served by (a) individual pumps (pre-IIP); and (b) collective pumps installed by the IIP project.	Brian Howard, MSc, TAMU	Dr. William Payne, TAMU	Dr. Atef Swelam (ICARDA), Dr. Alaa Gharieb (NWRC), and Dr. Francois Molle (IWMI), and Dr. Fawzi Karajeh

Annex V: Summary of Summer 2011 Student Exchange Program (Continued...)

Lebanon				
Research Topic	Goal/Objective	Student	Advisor	Co-advisors
Information gaps between research institutions, extension offices, and farmers in the WLI benchmark site, Northern Bekaa Valley, Lebanon	To identify information gaps between research, extension, and farmers in the WLI benchmark site in order to better address the agronomic problems at the site, build capacity within the Lebanon extension system, and facilitate the adjustment of research goals based on farmer feedback.	Rebekah Mosses, MsC, UC-Davis	Dr. James Hill, UC-Davis	Dr. Hassan Machlab, ICARDA
Water accounting of the Orontes Basin in Lebanon	To understand the evolution of water balance and to have a better quantification of the resource as well as its productivity by considering surface/groundwater interactions.	Roula Bachour, PhD, USU	Dr. Mac McKee, Utah State Univrasanteersity	Dr. Musa Nimah (AUB), Dr. Fadi Karam (ICARDA)
Water accounting		Joseph Monical, PhD, UIUC	Dr. Prasanta Kalita, University of Illinois – Urbana Champaign	Dr. Francoise Molle and Dr. Fadi Karam
Jordan				
Research Topic	Goal/Objective	Student	Advisor	Co-advisors
Application of SWAT Model to study the effects of water harvesting interventions on soil erosion and crop productivity in an arid environment in Jordan	To adapt the SWAT model to predict the effects of water harvesting interventions on bio-physical properties that are applicable to similar arid environments.	Loubna Mahasneh, MsC, JUST	Dr. Majed Abu Zreig, Jordan University of Science and Technology (JUST)	Dr. Feras Ziadat (ICARDA), and Dr. Raghavan Srinivasan (TAMU)

Annex VI: Scope of Work for Student Research

Annex VI (a): Scope of work for Student Research at Nubaria Project, Egypt



Middle East Water and Livelihoods Initiative (WLI)
Improving Rural Livelihoods through Sustainable Water and Land-
use Management in the Middle East



Project

Intensification of agriculture and water management in the Western Nubaria project, Egypt

Goals and Objectives

Goal

Analyze the spatial diversity of cropping patterns and their main determinants regarding constraints linked to water delivery and farming system to assess ways of further increasing water productivity at the plot and project levels.

Objectives

The El Bustan (extension) and Thiba irrigated schemes source their waters from the Nubaria canal (which borders the delta on its western side) through several successive elevations by pumping stations and distribution through lined elevated primary and secondary canals: these feed into tertiary open canals (mesqa) in El Bustan; and into underground pipes in Thiba. Electric pumping stations then abstract water from these mesqa/pipes and serve an area of 20 feddans that is cultivated by either 8 “beneficiaries” (*muntafi’in* ; 2.5 fed each), or 4 graduate (5 fed. each), or one investor. Some of these tertiaries may serve up to 18 pumping stations.

These collective pumping stations were initially designed to supply movable lines of sprinklers, with one or two out of 4 farmers (in the case of graduates) being able to operate at a given time. With time, many farmers have shifted to fruit trees and increased vegetable production, both being irrigated with drippers. This change includes several benefits: a) a higher income linked to the production of higher value crops; b) easier farm operations and less burden with manipulating the lines of sprinklers; c) a reduced abstraction of water, which has greatly reduced the tension and conflicts at the station and tertiary levels. But such a change is predicated upon 1) a higher availability of capital (both to invest in the system, wait for the trees to reach production stage –although intercropping is often practiced in the meantime, and deal with higher uncertainty in both production and prices, especially for vegetables); 2) a higher availability/ predictability of water supply (optimum irrigation of trees and vegetables in summer requires frequent turns, unlike crops like spring wheat, water melon or groundnut that are quite typical of the areas with poorer farmers and/or water supply).

There is therefore a strong linkage between the characteristics of water delivery at the head of the tertiary and the ability to diversify and raise water productivity at both the plot and scheme levels. In turn, the cropping pattern within this tertiary, dictates the overall demands (with drip systems limiting

‘demand’). The study will document and analyze the spatial variability of cropping patterns and farming systems and focus on the constraints to crop diversification/increasing productivity that pertain to the both the *farm* itself (beneficiary vs graduate, family size, capital; technical knowledge, risk aversion, etc) and *the quality of water supply* (quantity, water level in the secondary canal, length of ‘on’ and ‘off’ periods, predictability, possible faulty design regarding slope of canals or pipes, pumping capacity, etc, availability of wells,...)

Methodology

The study will include the following steps

Spatial variability: a first step consists in analyzing the spatial variability of cropping patterns (and corresponding on-farm irrigation technologies) by using available maps (4 types of farms: beneficiaries, graduate, investors, companies - focus will be on the former two; cropping patterns available at the village level; soil, etc), satellite images, and GoogleEarth.

Water management: water in the two projects comes from the Nubaria canals. Water supply at the plot level therefore depends on a long ‘line of transmission’, from the Nubaria canal to the El Bustan and El Nasr canals, then to the primary canals of the two project areas, all the way through secondary (branch) canals to mesqa and plots. Interviews with managers at different levels in the system will allow understanding of the constraints faced at nested scales and how these translate in particular patterns of supply within the projects. Attention will be given to evolution in time, since the quantity of water available has changed with gradual land development within the projects and outside of it. The sequences of ‘on’/‘off’ periods will be mapped out, since tail-end areas tend to have fewer days ‘on’ than head-end areas (although there are variations to this rule depending, for example, on canal topography and the political clout of users – e.g. investors vs. small farmers). Based on the understanding of the spatial distribution of supply, a set of approximately 10 mesqa will be selected in contrasting areas (with good and poorer water supply; beneficiaries and graduates).

Mesqa level surveys: in each of the selected mesqa, attention will be first directed to water management among the n pumping stations served by this mesqa. [The patterns vary from no cooperation at all – pumps operate at the same time, with head-end pumps getting more water when supply is limited, to some rotations organized in case of prolonged shortage – although design normally allows all pumps to work together in full-supply conditions]. This will allow the identification of possible differential constraints between head-end and tail-end pumping stations. Two pumping stations (head and tail) will then be selected and farming system analyses carried out for each of the 4(or 8) farmers sharing each particular station.

Pumping station survey: the farmers of each pumping station considered will be interviewed in depth. The arrangements to share water and expenditures around the common pumping stations will first be analyzed. Farming system surveys will be aimed at understanding *crop choice*, that is, the particular sets of constraints and opportunities faced by the farmer that explain and dictate what he chooses to grow and how, and, as a result, the economic performance of the farm and the productivity of land and water.

The questionnaire will include in particular:

- History of the farm (cropping patterns, investments,...) and family structure
- Farm equipment and other permanent assets

- Livelihood system at the family level (range of incomes, economic activities)
- Cropping-patterns, techniques, yields, crop budget (full costs and benefits; including individual and collective irrigation technologies)
- Labour employment (if relevant local labour availability and markets)
- The land market (observed transactions in the area)
- Importance of water supply patterns on crop choice and practices (unpredictable supply leads to overirrigation practices, avoidance of cash crops and fruit trees, etc)
- Marketing (price variability of different crops, bargaining power, importance of product quality, etc)

The combined analysis of ‘water vulnerability’ and farming systems will allow an assessment of the link between water conditions and land/water productivity for different types of farm/farmers.

Note 1: the two areas are considered jointly here but it is probably wise to limit the activity to the El Bustan part, with open tertiaries and more ‘beneficiaries’. After the initial analysis it might also be possible to consider increasing the number of mesqa considered while reducing the work in each of them (f.i. limiting the farming system analysis to the farmers served by the tail-end pumping stations), which would allow better insight on the diversity of collective arrangements *within* mesqas. Note 2: the farming system assessment is greatly facilitated by the fact that the farm history is relatively short (10 years on average since settlement), land endowments identical (except for some cases of limited expansion), and the farm-area small enough to limit labour constraints.

Expected outputs

1. Identification of constraints to intensification/diversification in the West Nubaria project;
2. Quantification of spatial variability of water delivery patterns;
3. Assessment of the importance of water supply patterns, in particular predictability/reliability, on the productivity of the irrigation system and farmers’ income.
4. Recommendations to improve reliability of water supply at different nested levels

Lead institution and component leader

- Ministry of Agriculture (Wester Nubaria development Project team, through ARC)

Other institutions and scientists involved

- Dr. Atef Swelam, ICARDA
- Dr. François Molle, International Water Management Institute (IWMI)
- M.S. student from an Egyptian University with faculty advisor
- M.S. student from US University with faculty advisor

US Student and faculty advisor profile

Student

M.S. student in the field of rural development, agriculture, or water management

Faculty Advisor

Professor or extension specialist in the field of rural development, agriculture, or water management

Duration and dates

10 week field work starting June 2011

Reporting

The project will provide reports consistent with the activities of the program. Part of the reporting process will draw on the indicators measured to evaluate progress of the project. Program and financial reports will be submitted following sponsor's requirements on schedule and format.

Annex VI (b): Scope of work for Student Research in Damanhour, Egypt



Middle East Water and Livelihoods Initiative (WLI)
Improving Rural Livelihoods through Sustainable Water and Land-
use Management in the Middle East



Project

Assessing changes in water management practices after implementation of the IIP project in Damanhour, Egypt

Goals and Objectives

Goal

Analyse and compare actual management practices in two irrigated areas served by a) individual pumps (pre-IIP); b) collective pumps installed by the IIP project.

Objectives

The IIP project was aimed at replacing atomized individual pumping sets by a collective pump at the Mesqa level: this pump would either serve an “elevated mesqa” that would deliver water by gravity to the fields, or a buried pipe, with the initial mesqa filled in in both cases. Benefits included gain in arable area, avoidance of pollution of water at the tertiary level, economies of scale in pumping costs (especially after early diesel engines were replaced by electric pumps), reduced diverted volumes which should add up at the branch canal level and reduced diversions. Other changes in the regulation of the parent branch canal, from on/off flows to continuous flow, were also expected to ensure security in supply and therefore to avoid having farmers over-irrigating due to expected uncertainty in supply.

The Mahmoudia canal command area, in Damanhour district, was one of the first regions considered by the project and has both some areas with more than ten years of functioning of the IIP system, and areas still waiting for the IIP investment. It therefore lends itself to a stock-taking exercise on some early implementation of the IIP, as well as to a comparison with ‘traditional’ situations. The study will document the problems faced by farmers (regarding water), and management practices, estimate their impact on quantity and quality of intake and return flows in the two sites (indicated by white spots on the map below); it will examine whether the benefits expected from the IIP investments were fulfilled and compare them with the ‘traditional’ pre-project situation.



Methodology

For each of the two selected areas:

Explore: Collect survey data on a sample of 6-10 pumping stations/Water User Associations with ten years of IIP implementation, regarding the benefits expected/experienced, the problems faced, the comparison with the earlier situation (for the equipped area), the degradation of water quality, the fulfillment of the WUA's tasks (water management, financial management, pump operation and maintenance, conflict resolution,...), collective action, the degree of permanence of individual pumping and use of drainage water, etc.

Zoom: Data on actual water management practices in two selected pumping stations in IIP zone (one with open tertiary canal (*mesqa*), one with a piped system), and one in the pre-IIP area, during a period of three weeks (pumped water, cropping patterns, crop water budgets, crop economic budget and share of irrigation costs, conjunctive use from wells or abstraction from water ways, water quality constraints, collective action, conflicts, etc). The discharge by the pump will be monitored by a special automatic device, which will allow a rough water balance to be established at the mesqa level.

Expected outputs

5. Stock-taking on the most important investment project in the delta after ten years and assessment of expected vs actual benefits
6. Possible improvements/adjustments for future IIP areas
7. A report and one journal article

Lead institution and component leader

- NWRC (Dr Ala)

Other institutions and scientists involved

- Dr. Atef Swelam, ICARDA
- Dr. François Molle, International Water Management Institute (IWMI)
- M.S. student from an Egyptian University with faculty advisor
- M.S. student from US University with faculty advisor

US Student and faculty advisor profile

Student

M.S. student in the field of rural development, agriculture, or water management

Faculty Advisor

Professor or extension specialist in the field of rural development, agriculture, or water management

Duration and dates

Two months of field work starting end of June 2011

Reporting

The project will provide reports consistent with the activities of the program. Part of the reporting process will draw on the indicators measured to evaluate progress of the project. Program and financial reports will be submitted following sponsor's requirements on schedule and format.

Annex VI (c): Scope of work for Student Research at the Northern Bekaa Valley, Lebanon



Middle East Water and Livelihoods Initiative (WLI)
Improving Rural Livelihoods through Sustainable Water and Land-
use Management in the Middle East



Project

Information gaps between research institutions, extension offices, and farmers in the WLI benchmark site, Northern Bekaa Valley, Lebanon

Goals and Objectives

Goal

Agriculture research in Lebanon is mainly carried out by the Lebanese Agricultural Research Institute (LARI) and universities, such as the Lebanese University and the American University of Beirut (AUB). Though these institutions do some local extension work, the Ministry of Agriculture's Extension Directorate has the main responsibility of getting new information out to farmers. However, due to years of political conflict, the extension services in Lebanon have had limited resources to become a strong link in the information chain between researchers and farmers. There are very few extension specialists that are well informed about current research that may be applicable to current field problems. As a result, farmers have received antiquated and, at times, wrong information from extension agents, which has perpetuated mistrust between farmers, extension agents, and researchers.

The goal of this study is to identify information gaps between research, extension, and farmers in the WLI benchmark site, Lebanon. Improved communication between these three groups will help better address the agronomic problems at the benchmark site, build capacity within the Lebanon extension system, and facilitate the adjustment of research goals based on farmer feedback.

Objectives

1. Identify existing research results and available technologies at LARI and other research/academic institutions and determine what current research can be applied at the farmer-level
2. Talk to extension agents and assess their knowledge of farm-level activities in the benchmark and their awareness of current research being conducted at LARI and universities
3. Try to link research needs of the extension offices to current research at LARI and universities
4. Determine how extension agents assess farmer problems and how they communicate new information to farmers

5. With local extension agents, facilitate a survey of farmer needs in terms of crop production information and how they receive information or help
6. Try to link farmer needs to current research at LARI and universities and determine the more effective way to transfer research information to farmers

Expected outputs

8. Understanding of current applied research being conducted by LARI and local universities
9. More communication between farmers, extension agents, and researchers in the benchmark site
10. Understanding of farmer needs and what research could be applicable to their situation
11. Publish paper on lessons-learned and steps to move forward for the WLI benchmark site, Lebanon

Lead institution and component leader

- Dr Hassan Machlab, Lebanon Country Manager, ICARDA
- Dr. Jim Hill, International Program Office, UC Davis

Other institutions and scientists involved

- Dr. Theib Oweis, Director, Integrated Water and Land Management Program, ICARDA
- Dr. Ibad Jomaa, Head of Dept. of Irrigation and Agrometeorology, LARI
- Eng. Mohammed Remeh, Director of the Extension Directorate in Baalbek (Northern Bekaa Valley)
- M.S. student from American University in Beirut with faculty advisor
- M.S. student from US University with faculty advisor

US Student and faculty advisor profile

Student

M.S. student in the field of rural development or agriculture education

Faculty Advisor

Professor or extension specialist in the field of rural development or agriculture education

Duration and dates

Two months of field work starting July 1, 2011. Place of field work will be in the Northern Bekaa Valley, Lebanon

Estimated budget

Costs to be covered by US universities (Note: If project is in Syria, ICARDA will cover all costs for both US and national students/faculty involved in WLI projects)

	US Student	US Faculty
1. Travel	\$2500	\$2500
2. Lodging and Board	\$2000/ month	\$1000 (one week)
3. Visas	\$200	\$200
4. Ground travel	See ICARDA (below)	See ICARDA (below)
5. Research Expenses	See ICARDA (below)	See ICARDA (below)

All costs for national partner students to be covered by ICARDA. Project costs for ground travel and local research to be covered by ICARDA.

Reporting

The project will provide reports consistent with the activities of the program. Part of the reporting process will draw on the indicators measured to evaluate progress of the project. Program and financial reports will be submitted following sponsor's requirements on schedule and format.

Annex VI (d): Scope of work for Student Research at the Upper Orontes Basin, Lebanon



Middle East Water and Livelihoods Initiative (WLI)
Improving Rural Livelihoods through Sustainable Water and Land-
use Management in the Middle East



Project: Water accounting of the upper Orontes basin in Lebanon

Goals and Objectives

Context and Goal

Close to 400 million m³ of water are generated in the Lebanese part of the upper Orontes basin. This water comes mostly from the many springs that are supplied by infiltration of rainfall and snowmelt in the bordering Lebanon and anti-Lebanon mountains. Most of these springs, in particular those of Hermel and of Laboueh have long been used for developing villages and their orchards, as well as larger irrigated areas, some canals dating from at least Roman times.

Groundwater has been increasingly exploited in the basin and is now a critical problem in some parts of the basin, in particular in the region of Qaa. Surface water/groundwater interactions are therefore a crucial issue to understand the evolution of the basin hydrology. Urban and other uses have also increased and there is altogether a need to look at the evolution of the water balance and accounting of the upper basin. This will allow a better quantification of the resource and of its productivity.

Objectives

7. *Collect:* historical data on rainfall, spring flow, irrigation and urban use, groundwater expansion, cropping areas, runoff, water quality, etc. this information will be sourced from the literature, different government agencies, municipalities, universities, and will also be discussed in a more qualitative way with water users in the basin (eg the Laboueh-Qaa ancient canal and history of water supply). Satellite images (CNRS, ICARDA, LARI) will help assess changes in cropping areas.
8. *Develop:* a water accounting of the basin according to IWMI's methodology and categories, including an estimate of actual evapotranspiration in cultivated and on-cultivated areas, and if possible changes over time of the different fractions (according to example of the Jordan basin).
9. *Strengthen:* understanding of the hydrology and human uses of water in the upper Orontes basin
10. *Provide:* assessment of the sustainability of the different uses, clear vision of Lebanon's current use/share, assessment of changes to be brought by the dam project on the upper Oronte.

11. *Highlight:* how recent changes in land/water use (notably groundwater use) have altered the hydrology

Expected outputs

12. A water accounting of the upper Orontes basin, with a historical perspective.
13. Understanding of the implications of current groundwater use
14. A vision on actual and possible use of water in the Lebanese part of the Orontes

References on water accounting

http://www.iwmi.cgiar.org/Publications/SWIM_Papers/PDFs/SWIM01.PDF

http://www.iwmi.cgiar.org/assessment/files_new/publications/CA%20Research%20Reports/CARR9.pdf

http://www.iwmi.cgiar.org/Publications/IWMI_Research_Reports/PDF/pub049/Report49.pdf

Lead institution and component leader

- LARI

Other institutions and scientists involved

- Dr. François Molle, International Water Management Institute (IWMI)
- Dr. Fadi Karam, International Center for Agricultural Research in the Dry Areas (ICARDA)
- M.S. student from University of Lebanon with faculty advisor
- M.S. student from US University with faculty advisor

US Student and faculty advisor profile

Student: M.S. student in the field of rural development, agricultural economics, or water management

Faculty Advisor: Professor or extension specialist in the field of rural development, agricultural economics, or water management

Duration and dates: Two months of field work starting end of June 2011

Reporting: The project will provide reports consistent with the activities of the program. Part of the reporting process will draw on the indicators measured to evaluate progress of the project. Program and financial reports will be submitted following sponsor's requirements on schedule and format.

Annex VI (e): Scope of work for Student Research in Jordan



Middle East Water and Livelihoods Initiative (WLI)
Improving Rural Livelihoods through Sustainable Water and Land-
use Management in the Middle East

Scope of Work

Project

Application of SWAT model to study the effects of water harvesting interventions on soil erosion and crop productivity in an arid environment in Jordan

Rational

Water harvesting practices have helped communities in the dry areas of Jordan cope with water scarcity for thousands of years. But over time, many water-harvesting systems have fallen in disrepair due to new developments and changing socio-economic conditions. Growing water scarcity and climate change have renewed the interest in water harvesting. Modeling water-harvesting systems that are adjusted to the current needs of rural communities requires a good understanding of the complex interactions between different water-harvesting systems, water uses and users at the watershed level.

Water harvesting interventions are currently being promoted as a tool to improve land and water productivity, and mitigate land degradation. However, quantitative information about the impacts of these interventions has not been studied, especially at watershed level. Modeling at watershed level is crucial to out scale the quantitative relationships to wider areas within the arid environments, which are similar to the study area.

Main goal

This study aims at adapting the SWAT model to predict the effects of water harvesting interventions on bio-physical properties that is applicable to similar arid environments.

Specific objectives

- Study the effects of selected water harvesting interventions on sediment quantity and quality, run-off, and crop productivity;
- Evaluate the applicability of SWAT model in a typical arid area of Jordan.

Expected outputs

- The effects of selected water harvesting interventions on soil erosion and crop productivity assessed;
- SWAT model adapted to assess the impacts of water harvesting interventions in an arid environment.

Names of scientists and institutions involved in the research

Name of the primary advisor: Prof. Majed Abu Zreig, Jordan University of Science & Technology (JUST), Irbid, Jordan

Name of the co-advisor: Dr Feras Ziadat (IWLMP-ICARDA)

Name of the co-advisor from US University: Prof. Raghavan Srinivasan, University of Texas A&M

Student

Eng. Lubna Al-Mahasneh, National Centre for Agricultural Research & Extension (NCARE) – GIS Unit, Water & Environment Program.

Degree: BSc in Civil/Agricultural Engineering, JUST (2002)

Research degree: Master of Sciences, Faculty of Engineering, Jordan University of Science & Technology.

US University involved in the research project

Duration of the research

Three years (2011-2013)

Annex VIII: WLI Contact Information

Representative's name	Organization	Role in WLI	Contact information
Steering Committee			
Dr. Kamel Shideed	ICARDA	Chair	k.shideed@cgiar.org
Dr. Theib Oweis	ICARDA	WLI, Project Manager	t.oweis@cgiar.org
Dr. Fadi Karam	ICARDA	WLI, Project Coordinator	f.karam@cgiar.org
Dr. Scott Christiansen	USAID	Member	schristiansen@usaid.gov
Dr. Sandra L. Russo	UF	Member	srusso@ufic.ufl.edu
Dr. Francois Molle	IWMI	Member	francois.molle@ird.fr
Dr. Nahla Mohamed Zaki	Director of Water Management Research Institute, National Water Research Center, Egypt	Member	n_abouelfotouh@nurc-eg.org
Dr. Hamdy Khalifa	Director, Soil, Water and Environment Research Institute, Agriculture Research Center, Egypt	Member	Alfalahi_alrawabi@hotmail.com
Prof. Bassem Ashour	Egypt	Member	
Dr. Ahmed Adnan Ahmed Alfalahi	SBAR, Iraq	Member	Alfalahi_alrawabi@hotmail.com
Dr. Omar Kafawin	American University of Jordan, Dean and Faculty of Agriculture	Focal person	Kafawin@ju.edu.jo
Steering Committee (Continued)			
Dr. Omar M. Kafawin	University of Jordan	Member	kafawin@ju.edu.jo
Dr. Yasser Mohawesh	NCARE, Jordan	Member	Yasser_ncartt@yahoo.com
Ms. Randa Massaad	LARI, Lebanon	Member	rmassaad@lari.gov.lb
Dr. Nasser Sholi	NARC, Palestine	Member	nassr3@yahoo.com
Dr. Awadis B. Arslan	GCSAR, Syria	Member	awadisarslan@yahoo.com
Dr. Khader Balem Atroosh	AREA, Yemen	Member	kbatroosh@hotmail.com

Annex VIII: WLI Contact Information (Continued...)

Representative's name	Organization	Role in WLI	Contact information
Partnering Countries			
Dr. Nahla Mohamed Zaki	Director of Water Management Research Institute (WMRI), National Water Research Center (NWRC), Egypt	Focal Person/NWRC	n_ouelfotouh@nwrc-eg.org
Hamdy Khalifa	Director, Soil, Water & Environment Research Institute (SWERI); Agricultural Research Center (ARC), Egypt	Focal Person/ARC	hekhhalifa@yahoo.com
Bassem Ashour	Faculty of Agriculture at the University of Zagazig, Egypt	Focal Person	bashour@zu.edu.eg ; bassemashour@yahoo.com
Dr. Ahmed Al-Falahi	Iraq	Focal Person	Alfalahi_alrawabi@hotmail.com
Dr. Yasser Mohawesh	National Center for Agricultural Research and Extension, Jordan	Focal Person	Yasser_ncartt@yahoo.com
Eng. Randa Massaad	LARI, Lebanon	Focal Person	rmasaad@lari.gov
Dr. Nasser Sholi	National Agricultural Research Center, Palestine	Focal Person	Nassr3@yahoo.com
Dr. Awadis Arslan	General Commission for Scientific Research, Syria	Focal Person	awadisarslan@yahoo.com
Dr. Khader Balem Atroosh	AREA, Yemen	Focal person	kbatroosh@hotmail.com

Annex VIII: WLI Contact Information (Continued...)

Representative's name	Organization	Role in WLI	Contact information
Partnering Countries			
Dr. Nahla Mohamed Zaki	Director of Water Management Research Institute (WMRI), National Water Research Center (NWRC), Egypt	Focal Person/NWRC	n_abouelfotouh@nwrc-eg.org
Hamdy Khalifa	Director, Soil, Water & Environment Research Institute (SWERI); Agricultural Research Center (ARC), Egypt	Focal Person/ARC	hekhhalifa@yahoo.com
Bassem Ashour	Faculty of Agriculture at the University of Zagazig, Egypt	Focal Person	bashour@zu.edu.eg ; bassemashour@yahoo.com
Dr. Ahmed Al-Falahi	Iraq	Focal Person	Alfalahi_alrawabi@hotmail.com
Dr. Yasser Mohawesh	National Center for Agricultural Research and Extension, Jordan	Focal Person	Yasser_ncartt@yahoo.com
Eng. Randa Massaad	LARI, Lebanon	Focal Person	rmasaad@lari.gov
Dr. Nasser Sholi	National Agricultural Research Center, Palestine	Focal Person	Nassr3@yahoo.com
Dr. Awadis Arslan	General Commission for Scientific Research, Syria	Focal Person	awadisarslan@yahoo.com
Dr. Khader Balem Atroosh	AREA, Yemen	Focal person	kbatroosh@hotmail.com