

Sustainable Development of Drylands
in Asia and the Middle East:
Jordan Component

Visit Report
February 29 to March 4, 2004

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Prepared
by

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I. Introduction

As the project coordinator for the Sustainable Development of Drylands in Asia and the Near East: Jordan component, Dr. A. Tamimi visited Jordan from February 29 to March 4th, 2004 to follow up on the activities of the project. The objectives of the visit were:

- 1) Visit National Center for Agricultural Research and Technology Transfer, NCARTT, to negotiate holding the June workshop in the center.
- 1) Follow up on the Terms of Reference for the Wadi Mousa Visitor's Center.
- 1) Meet with Dr. Ziad Ghazawi, Jordan University for Science and Technology, JUST, and with Dr. Manar Fayyad from the Water and Environmental Research Study Center, WERSC, at University of Jordan for further discussion on advancing the preparation of the proposal for the monitoring of the recycled effluent at Wadi Mousa, Aqaba and later at Mafraq WWTPs in cooperation with Water Authority of Jordan, WAJ.
- 1) Travel to Aqaba and meet with Dr. Bilal Bashir, Commissioner of Aqaba Special Economic Zone Authority, ASEZA, to identify and determine the type of activities and technical assistance needed in Aqaba.
- 1) Report on activities and project status to Dr. Amal Hijazi at USAID/Amman and obtain feedback, comments, and concerns.

I. National Center for Agricultural Research and Technology Transfer, NCARTT

On March 1, 2004, Dr. Tamimi traveled to NCARTT and met with:

Dr. Abdel Nabi Fardous, Soil and Irrigation
Director General
PO Box 639
Baqa' 19381, Jordan

Tel: +962-6-472-6680
Fax: +962-6-472-6099

Email: fardous@ncartt.gov.jo or director@ncartt.gov.jo

Dr. Tamimi presented a Power Point show to Dr. Fardous. The presentation gave a full view of what IALC stands for and the scope of its activities. Also, Dr. Tamimi presented the Sustainable Development of Drylands project and concentrated on Jordan component.

Dr. Fardous informed Dr. Tamimi that he thought the RADAC proposals for Jordan are dictated by University of Jordan and did not know that his center can submit proposals to the RADAC. Dr. Tamimi informed him that if he has a research or demonstration concept that he would like to submit to the RADAC that Dr. Tamimi would connect him with the appropriate faculty at The University of Arizona and in cooperation with other Jordanian institutions if needed to fully develop the idea and produce a high quality research proposal to be submitted to the next RFP by IALC.

Dr. Tamimi indicated that IALC/The University of Arizona is planning to hold a Post Conference (Water Demand Management, May 28th-June 3) Wastewater Re-Use Workshop in Amman Jordan to immediately follow the conference. Dr. Tamimi asked if it would be possible to have the workshop held at the NCARTT facilities and the possibility of having NCARTT staff members participate in the workshop.

Dr. Fardous welcomed the idea and indicated that the facilities would be available as needed for the workshop. He also indicated that he would like to have one presenter and 3 participants from NCARTT attend the workshop.

Dr. Tamimi promised more information to be sent to Dr. Fardous about the workshop very soon.

I. TOR for Wadi Mousa Visitor Center

The Terms of Reference and Scope of Work, TOR, for developing the Wadi Mousa Visitor's Center tender documents were developed by Dr. Tamimi and were sent to the Badia Research and Development Program, BRDP, on February 16, 2004. The TOR was reviewed by Dr. Saad Al-Ayyash and a few comments were passed on to Dr. Tamimi.

During the meeting with Engr. Mohammed Shahbaz from BRDP on March 1, 2004, it was decided that Dr. Amal Hijazi, USAID – Amman mission should receive a copy of the TOR, for comments and approval since the tender documents will be developed for USAID. During phase II of the reuse implementation project funded and implemented by USAID – Amman Mission, the tender documents will be used by USAID subcontractor to construct the Visitor's Center.

During the meeting with Dr. Amal Hijazi on the afternoon of March 1, 2004, Dr. Hijazi requested that Dr. Tamimi meet with:

Engr. Mehran K. Meserlian, Environmental Engineer
Camp Dresser & McKee International Inc., CDM
Tel: +962-6-565-1918
Email: MeserlianMK@cdm.com

to see the possibilities of having Engr. Mehran review the TOR. The meeting took place in the afternoon of March 1, 2004 and Engr. Mehran promised to review the TOR and send any comments to Dr. Amal Hijazi.

CDM is providing a Scope of Work for USAID to subcontract Phase II of USAID – Amman Mission – reuse implementation project.

As per Dr. Hijazi's request, Dr. Tamimi and Engr. Mehran reviewed the cost estimate for constructing the Aqaba Water Friendly Garden being \$150,00 and the Wadi Mousa Visitor's Center construction estimate being \$240,000 and both approved of the cost as being reasonable.

I. Characterization of Effluent

Dr. Tamimi held a meeting with Dr. Manar Fayyad from WERSC and Dr. Ziad Ghazawi from JUST to discuss the status of the characterization of effluent proposal. Both Dr. Manar and Dr. Ziad promised to hold proposal development sessions during the next two weeks to define the proposal and to develop it.

As was decided in previous meetings and discussions that the Water Authority of Jordan, WAJ, should be a partner in this proposal, Dr. Manar and Dr. Ziad requested that BRDP send a letter to the WAJ Secretary General to nominate a representative from WAJ to participate in the development of the proposal. This needs to be done as soon as possible.

I. Update to USAID - Amman Mission

A meeting with Dr. Amal Hijazi from USAID took place on the afternoon of March 1, 2004. Dr. Tamimi updated Dr. Amal on the different activities of the Sustainable Development of Drylands project.

1. ASEZA

Dr. Hijazi indicated that there is a concern expressed by ASEZA about having a graduate student working her thesis and doing the work for the Water Friendly Garden. She requested to discuss this with ASEZA and find a good solution.

It was indicated during a meeting with Engr. Mohammed Shahbaz that there was an approval in the form of a letter sent from ASEZA to BRDP designating the new site as the site for the design and implementation of the Water Friendly Garden. Dr. Hijazi requested a copy of that letter to have in her files to support the allocation of funds by USAID for the implementation of the garden.

She also indicated that she had a meeting recently with Dr. Bilal Bashir and he indicated that ASEZA is in need of a wastewater management plan for Aqaba. She suggested a meeting with Dr. Bilal Bashir. When Dr. Tamimi indicated that ASEZA is claiming that Dr. Bashir is very busy or he is out of town when Ms. Shereen Batikhi from BRDP called his office to make an appointment for a meeting and the fact that he is avoiding meeting with the technical assistance

team while visiting Jordan, Dr. Hijazi picked up the phone and called him directly and requested from him to meet with Dr. Tamimi. He indicated Wednesday, March 3, 2004 as a good time.

1. Wadi Mousa Visitors Center

Dr. Tamimi indicated to Dr. Hijazi that a document for the Terms of Reference and the Scope of Work for the design and the development of tender documents for the Visitor's Center at Wadi Mousa have passed through BRDP and USAID comments are sought, she requested Dr. Tamimi to meet with CDM staff. Please refer to item III for details on this item.

1. WEPIA Conference in May

During the meeting with Dr. Hijazi, she indicated that IALC/The University of Arizona and USAID – Amman Mission – should try to publicize the project activities implemented in Jordan. She indicated that a whole session in the WEPIA conference should have been scheduled for the Sustainable Development of Drylands project. Dr. Tamimi indicated that there will be presentations made by The University of Arizona technical assistance team during the conference.

Dr. Hijazi suggested two presentations to be made, one by Dr. Tamimi to give light to IALC and present the activities of the project and another to be presented by Dr. Bassam Hayek about the monitoring of biosolids which the Royal Scientific Society / Environmental Research Center, RSS/ERC, is conducting in Jordan under the IALC project.

Dr. Tamimi promised to call Ms. Hala Dahlan from WEPIA and request a session for him during the conference. Dr. Tamimi did that and Ms. Dahlan requested an abstract from Dr. Tamimi to be sent to her. The write up of the presentation is due by the end of March, 2004 for the inclusion in the proceedings of the conference. Dr. Tamimi will meet that deadline.

1. Monitoring Effluent

After updating the status of the proposal being drafted by JUST and WERSC in cooperation with WAJ, Dr. Hijazi indicated that it will be more constructive if we know the plans of WAJ. WAJ is trying to have two divisions for the laboratory analysis: one in the North of Jordan and the second in the south of Jordan: Aqaba. She indicated that it would be great if this monitoring proposal incorporates WAJ strategic plan in it. Dr. Hijazi also indicated that ASEZA will be in charge of the Aqaba laboratories and it would be great if one or more of the ASEZA staff participate in the biosolids training session to be held in Arizona.

1. Biosolids Training

Dr. Tamimi indicated that a biosolids laboratory training workshop is in the planning to train Jordanian participants on specific analysis. Dr. Hijazi indicated that it would be great if the following Jordanian institutions are invited to nominate participants:

1. Two members from Royal RSS/ERC.
1. One participant from WAJ

1. One participant from NCARTT
1. One participant from ASEZA
1. One participant from the Ministry of Agriculture, MOA.

Dr. Tamimi promised to discuss this issue with IALC/The University of Arizona and investigate the logistics and financial possibilities of including the above Jordanian institutions in the biosolids lab training workshop.

I. Scope of Work for Aqaba - Visiting ASEZA

Dr. Tamimi flew to Aqaba in the morning of March 3, 2004 and spent the entire day in Aqaba. He arrived at 9:00 a.m. at the Aqaba international airport and called Dr. Salim Al-Moghrabi to see if he can pick him up at the airport. Dr. Al-Moghrabi indicated that he was very busy so Dr. Tamimi took a taxi to the ASEZA headquarters to find out that Dr. Al-Moghrabi was out of the office. Mr. Khaled Rajab Abu Aisheh met with him and said that Dr. Salim will be back in a while.

Dr. Tamimi indicated that there was a scheduled meeting with Dr. Bashir and he would like to meet with him. Mr. Khaled called Dr. Bashir's office to have a response from the secretary that Dr. Bashir is out of town.

Dr. Tamimi phoned Dr. Hijazi and informed her about the situation. She called Dr. Bashir and he gave a meeting time of 12:300 p.m.

Dr. Salim showed up around 10:30 a.m. Dr. Tamimi had a meeting with Dr. Salim, Mr. Khaled Abu Aisheh and Mr. Thaer Haj Ahmad.

Dr. Tamimi indicated that a list of tasks and activities defined as the Scope of Work for ASEZA was suggested by USAID on behalf of ASEZA that included at least 7 activities. During the initial year of the project USAID suggested to IALC/The University of Arizona to work on as many of these activities as possible. At some point the Scope of Work became a little vague due to a failure in communication. Dr. Tamimi indicated that he would like to define the Scope of Work for ASEZA during his trip to serve ASEZA better through the Sustainable Development of Drylands project.

1. Meeting with ASEZA Staff

a. Concerns

Dr. Al-Moghrabi, Engr. Thaer Haj Ahmad and Engr. Khaled Abu Aisheh mentioned the following concerns and observations:

2. Technical Assistance Team members from The University of Arizona come to ASEZA, collected information and prepared reports that had that information. Some of the reports never reached ASEZA and nothing was done.
2. In July, 2003, Dr. Peter Waller and Dr. Chris Choi visited ASEZA and met with Dr. Bashir and spent with him a lot of time. They presented seminars to him and to ASEZA that was irrelevant to the needs of ASEZA.
1. In October, 2003, Dr. Margaret Livingston and her students visited ASEZA and presented good ideas and methods to work on the Water Friendly Garden, and soon a masters student started working on the project and started collecting information and corresponding with all of ASEZA staff without any feed back or assurances that the work is being supervised by Dr. Livingston.
1. Designs for the Water Friendly Garden were sent to ASEZA and were not up to the expectations of ASEZA. The same work or better work could have been done by one of the architects working at ASEZA.
2. Recently, the flow of emails had been between Karen Vitkay and Ismail Bazian. Dr. Salim Al-Moghrabi and Dr. Bilal Bashir had been out of the loop and did not have a clue of the progress of the work. It was stated that the initial contact for this project with ASEZA started with Dr. Bilal Bashir and Dr. Salim Al-Moghrabi from the Environmental Planning Directorate and not with Mr. Bazian from the Physical Planning Directorate. It was stated that the correspondence should had stayed between Dr. Salim Al-Moghrabi and Dr. Livingston.

It was emphasized that all work related to the Water Friendly Garden should be done by Ms. Vitkay and then reviewed and approved by Dr. Margaret Livingston. After that the work should be sent or cc'd by Dr. Livingston to Dr. Salim Al-Moghrabi and to Dr. Bilal Bashir.

Dr. Tamimi asked if any of the concerns listed above had been communicated to BRDP or Dr. Tamimi and the answer was negative. Dr. Tamimi indicated that communication between all parties involved should be better and any concern or question should be sent directly to him, to Mr. Bob Frietas and/or to Mr. Mohammed Shahbaz from BRDP. Also Dr. Tamimi indicated that all ASEZA's concerns will be taken seriously in future work.

a. Water Friendly Garden

What is the final product IALC/The University of Arizona will be providing to ASEZA? Dr. Tamimi believes that tender documents similar to the ones being proposed for the Wadi Mousa Visitor's Center should be provided to ASEZA and USAID – Amman Mission – to be delivered to the Phase II subcontractor for implementation. A Terms of Reference and Scope of Work needs to be developed for the production of the tender documents. Can the School of Landscape Architecture at The University of Arizona develop such tender documents? If so, who, when and how? If not, should IALC/The University of Arizona request this service from a Jordanian firm

through BRDP? All these questions need to be answered by IALC/The University of Arizona to proceed further in this activity.

USAID – Amman Mission – is allocating the funds to implement the Water Friendly Garden for this year. That means the proposed timetable of having the final designs and plans ready by December, 2004 will not work. To implement this task during this year, the designs and plans need to be ready by the middle of the summer and tender documents need to be ready by the fall. The actual implementation of the garden would start around November and be completed by the spring of 2005. More discussion and modifications of Karen’s timetable need to be done soon.

a. Training in Arid Landscape

It was requested during the discussion with ASEZA that a training mini-course be provided for ASEZA staff members in the Environmental and Physical Planning directorates. The mini-course would train two Engineers from ASEZA: Thaer Haj Ahmad and Khaled Abu Aisheh in the area of arid landscaping.

Dr. Tamimi requested that both engineers list the topics they would like to see in the mini-course to be submitted to the IALC/The University of Arizona technical assistance team for suggestions. Both engineers from ASEZA promised to send Dr. Tamimi a list as soon as it is ready to consult with the technical assistance team. The training mini-course can take place any time from now until December based on the availability of The University of Arizona faculty.

1. Meeting with ASEZA Commissioner: Dr. Bilal Bashir

The meeting with Dr. Bilal Bashir started at 1:30 p.m. Dr. Tamimi explained the Scope of Work that IALC/The University of Arizona has been working on for ASEZA and requested a better defined Scope of Work for the activities that ASEZA would like IALC/The University of Arizona accomplish for them. Dr. Tamimi summarized the discussion that took place in the morning with ASEZA staff (item IV-1 in this report).

Dr. Bilal Bashir indicated that in addition to the Water Friendly Garden and the arid landscape training for ASEZA staff, he would like IALC/The University of Arizona develop a management and operational procedure for the wastewater irrigation network being installed in Aqaba nowadays.

The required work would necessitate someone from IALC/The University of Arizona to spend sometime in Aqaba gathering all required information, develop a management model that is comprehensive and real, and then work with the different layers of staff members at ASEZA that deal with the wastewater irrigation network for training and observing the changing variables of the operation to adjust the management model.

a. Wastewater Irrigation Network Design

The network was designed by Montgomery Watson Inc. The network will deliver tertiary treated effluent to the Aqaba residential neighborhoods to irrigate street medians, proposed golf courses, public gardens, palm trees farms, demonstration sites, residential and commercial

gardens, etc.... The investigator of this activity would need to obtain and understand the design and the assumptions used in the design.

a. Implementation of Network

i) Review and Assessment of Network

The investigator needs to review, understand and assess the as built drawings and the actual constructed network.

i) Capacity to Hold and to Deliver Irrigation Water

The investigator needs to determine hydraulic variables and determine what kind of scenarios can be handled by the irrigation network, frequency of irrigation, cycles and blocks to be irrigated and times. In addition, a review and determination of the peak capacity of the network and the different scenarios that would be followed to deliver required contracted amounts to stakeholders.

a. Operational Management

i) Define operational patterns

Seasonal operational patterns should be studied and developed for the different irrigation scenarios.

i) Supply and Demand

A model of the supply of the treated effluent and the demand by the different stakeholders need to be developed and be part of the big picture.

i) Highs and Lows

High and low demands and supplies need to be broadcasted on yearly bases, seasonally, daily for each day of the year and on real time or hourly basis. These variables can be integrated in an operational model that would be developed. In addition, broadcasting future supply and demand needs to be predicted by the model.

i) Define variables

All variables of the network need to be identified and defined to be implemented in the model.

i) Real Time management

A real time management for the full scale system needs to be developed. These should be translated into management guidelines that would be adopted by the different stakeholders of the system who need to be identified and their responsibilities be defined.

i) Legal Aspects and Water Rights Definitions

The guidelines would define the legal aspects in terms of responsibilities and water rights for each of the stakeholders who produces, uses, benefits or operates the network or uses its services.

Finally, Dr. Tamimi believes that this problem can be approached as if an irrigation district is being created. But this irrigation district has many variables and restrictions such as the fact that the treated effluent can not be dumped when it can not be used by a stakeholder. The actual irrigation district, network, is complicated and a model to manage it is needed that would take into account all factors and variables present in this complex situation.

I. Conclusion

In conclusion, it can be stated that during Dr. Tamimi's visit to Jordan, all objectives of the visit were accomplished. Additional findings and tasks were identified and brought up for discussion.