

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

**Visit Report
July 9 to July 16, 2004**

Report Number
2004-004

Prepared

by

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Friday, July 16, 2004

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I. Introduction

Dr. Tamimi traveled to Jordan on July 9, 2004 until July 16, 2004 to coordinate activities related to the Sustainable Development of Drylands Project. The objectives for this visit are:

1. Coordinate, facilitate and represent The University of Arizona-IALC at the workshop entitled “The Role of Proxy Records in Understanding Drought and its Influence on Reclaimed Water Resources” held at Hashemite University in Zarqa.
2. Travel to JUST, Irbid to train Dr. Ghazawi and his staff at the reuse unit on how to use the TEEAL library provided by this project.
3. Meet with RSS/ERC staff to discuss biosolids proposal and programs.

II. The Role of Proxy Records Workshop

1. Opening of Workshop

This workshop was held at Hashemite University, Zarqa – Jordan starting July 11 and ending July 15. The brochure that outlines and defines the workshop is shown in appendix A.

At the opening ceremonies, Dr. Tamimi gave a speech identifying IALC. He thanked all who made the workshop possible including, USAID, Hashemite University, BRDP and The University of Arizona faculty members.

The university president, Dr. Al-Hadidi was present. In his welcoming remarks he welcomed the participants and The University of Arizona faculty, thanked IALC and BRDP on selecting to do the workshop at Hashemite University.

Dr. Raed Tabini from BRDP also participated in the welcoming remarks, welcomed everyone, thanked Hashemite University, The University of Arizona – IALC and faculty members.

2. Workshop

The workshop was a success and the materials covered were comprehensive and up-to-date. Dr. Ramzi Touchan and Dr. David Meko did an excellent job in introducing the different tools and techniques related to analyzing and predicting the occurrence of drought in general and in Jordan and the Middle East in particular. The topics covered at the workshop are shown in the brochure presented in appendix A.

Dr. Tamimi gave a lecture introducing IALC and the Sustainable Development of Drylands Project. There were many questions during the lecture that showed interest in submitting proposals to the RADAC funding program.

3. BRDP Role

BRDP as the subcontract supervising body between IALC – BRDP and Hashemite University was short staffed during the workshop. The contract with Hashemite University was not signed; the Brochure were not printed by Hashemite U as originally proposed and had to be printed by Dr. Ramzi Touchan in the last minute; the evaluation forms were not ready; nor were the certificates. It is suggested here that the evaluation reports be designed by the instructors and need to be designed ahead of time and provided as part of the course materials.

BRDP nominated two faculty members to participate in the last day of the workshop to present lectures on wastewater reuse activities in Jordan. Nobody showed up for the lectures which made The University of Arizona lecturers uncomfortable.

4. Development of Certificates, Contract and Evaluation Forms

Dr. Tamimi developed new certificates that were given to the participants at the workshop's closing ceremonies. In addition, a simple contract was developed and given to BRDP to use for this workshop between BRDP and Hashemite University. The evaluation form that was used in a previous workshop was modified a little and used to assess the quality of the workshop. All these documents are shown in appendix B.

5. Participants

The participants list is shown in the table below.

Participants List		
Name	Address	E-Mail
Yousef Jubran Qassar	Ministry of Water and Irrigation	Yousef_Qassar@yahoo.com
Muawia Samarah	Ministry of Water and Irrigation	Muawia_Samarh@mwi.gov.jo
Dr. Moshrik R. Hamdi	The Hashemite University	Moshrik@hu.edu.jo
Amgad Khundakji	Ministry of Water and Irrigation	amgadaref@hotmail.com
Dr. Masdouq Al-Taj	The Hashemite University	maltaj@hu.edu.jo
Dr. Fakher Aukour	The Hashemite University	Fakagr67@hu.edu.jo
Monther Abu Haltam	Natural Resources Authority	Monther999@hotmail.com
Dr. Ahmad El-oqlah	Yarmouk University	El-oqlaha@yu.edu.jo
Salameh Alkhrishah	Ministry of Water and Irrigation	Sakamakhrisha@gov.jo
Rupir Masarwah	Natural Resources Authority	Masarweh54@yahoo.com
Dr. Mohammad Al-Rababh	Jordan University for Science and Technology	alrababa@just.edu.jo
Prof. Jamal Sawwan	Jordan University Fac. Of Agric.	Jsawwan@Ju.ecu.jo

As shown in the above list, twelve participants from different Jordanian institutions were present in the workshop. In addition, four students from Hashemite University also participated and one from BRDP. The participants were very enthusiastic about the work and were there more than 80% of the time during the workshop. That was the condition to receive a certificate.

6. Participants Comments and Recommendations

During the evaluation session, a discussion was open to the participants who suggested the following:

1. Provide an advance course on the same topic in the future.
2. Continue working on the subject of the workshop in Jordan and not to have this workshop to be the final avenue.
3. Work with The University of Arizona and other Jordanian agencies and ministries to establish a drought center with the following applications:
 - Dendrochronology
 - Watershed Management
 - Remote Sensing
4. The topics were broad subjects and a future workshop should be more specific.
5. Increase the number of university student participation.
6. Develop a course related to the subject matter at a Jordanian university.

7. Final Ceremonies and Handing Certificates

At the end of the workshop, the afternoon of July 15, 2004, the closing ceremonies witnessed closing remarks by Hashemite University Vice President for Academic Affairs: Dr. Talal Al-Akashah who again thanked everyone and specifically The University of Arizona-IALC and USAID for holding the workshop at Hashemite University.

Dr. Tamimi thanked everyone and reiterated the objectives of the workshop and mentioned the recommendations and comments shown in the above subsection. He also thanked BRDP and USAID for making the workshop a success.

III. JUST and TEEAL

Dr. Tamimi traveled to Irbid and met with the staff at the reuse unit represented by Dr. Ziad Ghazawi. He installed the TEEAL engine at the reuse unit computer and trained the staff including Dr. Ziad on how to use TEEAL and how to retrieve and print research papers.

IV. RSS/ERC Visit

Dr. Tamimi visited the RSS/ERC staff on July 14 to discuss the biosolids projects and proposals with them.

Present were Dr. Bassam Hayek and Engr. Wael Suleiman. Dr. Tamimi requested that the technical report for the characterization of biosolids be submitted to IALC in order to expedite the review and the making of a decision regarding the application of biosolids proposal submitted by RSS to IALCS for funding through the Sustainable Development of Drylands Project.

It was indicated by RSS staff that the technical report and a new updated version that took into account the comments made by IALC staff during their visits to Jordan on the application of biosolids proposal will be ready by the end of July and will be sent to IALC.

During phase II of the biosolids project, the land application of biosolids, ASEZA will be invited to join the biosolids ad hoc committee.

The decision to make Wadi Hassan the site for the phase II project was made based on discussion with the biosolids ad hoc committee.

RSS/ERC is working on getting a permit to install the weather station at Wadi Hassan from WAJ since they are the owner of the site.

For the biosolids advance laboratory study tour to Arizona, it was requested that the process of obtaining visas start as soon as possible to make sure that one of the participants will receive a visa in a timely manner. One of the participants obtained a visa to travel to the USA for 5 years, but the visa came in late and he was not able to travel to Arizona to participate in the study tour held during May.

It was suggested by the RSS/ERC staff to have the ad hoc committee members visit The University of Arizona on a study tour related to wastewater biosolids treatment and reuse.

V. Conclusion

The objectives of the visit to Jordan were fulfilled and the workshop was a success.

Appendix A
Workshop Brochure

Workshop Speakers



Ramzi Touchan is an Associate Research Professor in the Laboratory of Tree-Research at the University of Arizona. He is an experienced dendrochronologist, dendroclimatologist, dendroecologist, and watershed and natural resources manager. His field of expertise has focused on developing long tree-ring chronologies to reconstruct past climate in different parts of the world. He developed the first dendroclimatic reconstruction (AD 1600-1995) in the Near East. This reconstruction has helped improve the understanding of the duration and intensity of drought in southern Jordan.



David M. Meko is an Associate Research Professor in the Laboratory of Tree-ring Research at the University of Arizona. He uses tree-ring data and instrumental data to study the natural variability of climatic and hydrologic systems. He has developed extended records of stream flow for water resources in western United States. Current research topics include riparian dendrochronology, the improvement of quantitative methods for stream flow reconstruction, and estimation of the variability of the North American monsoon.



Nizar Abu-Jaber is an associate professor of geochemistry and chair of the department of Earth and Environmental Sciences at Yarmouk University. His research interests involve water resource monitoring and management using geochemical and isotopic techniques. He is also interested in using various proxies to understand Quaternary fluctuations of climate in Jordan.

Sustainable Water

Resources

Management:

The Role of Proxy Records in Understanding Drought and its Influence on Reclaimed Water Resources

Resources

Sunday, July 11, 2004 To
Thursday, July 15, 2004

Workshop Held
at

Hashemite University,
Zarqa, Jordan

	
BRDP	Hashemite University
	
	
USAID	IALC

The Problem

Water is the most limiting factor for agricultural production in Jordan and all the neighboring countries. The quantity and quality of water often constrain agricultural development and any plans for future expansion. Water resources in this dry land region are insufficient to support its rapidly growing population. The human population in the Near East is growing rapidly, now surpassing 200 million, and competes for shrinking water resources for agricultural development. The Near East has one of the highest population growth rates in the world, with an annual average increase of 3.6%. Between the years 1990 and 2010 the population of the Near East is expected to more than double. Nations like Jordan are swiftly approaching the point where they will use all the available water resources. The Bureau for the Near East (1993) projects that the demand for water in Jordan in the year 2030 will be six fold that of 1985, which implies severe water shortages in the future. Human activities in this dry region may also cause the degradation of land and water resources.

Given the limited availability of potable water, governments in the region are insisting on developing methods for reclaiming used water. In Jordan for example treated wastewater plays a critical role in supplying the agricultural sector with water. The use of treated wastewater in agriculture can serve both the agricultural sectors needs for water and constitutes a sustainable way of disposing of wastewater. Political leaders and resource planners must have sufficient information about the duration, distribution, and intensity of past and future drought. To properly evaluate the risk of drought we need to characterize the variability of past climate on time scales of centuries. Most of the high quality and continuous instrumental climate records in the region start in the 1940s or 1950s, and so contain little information on variability of climate over decades. However, well-developed scientific techniques do exist to provide the technical knowledge required for making sound decisions in advance of a catastrophic drought.

Dendrochronology can provide the type of knowledge upon which to base such sound decisions. Dendrochronology, pioneered at the University of Arizona, is an important available tool for extending climatic records. Time series of tree-ring growth measurements spanning several centuries can serve as proxy records of past climatic conditions. Such records provide us with knowledge of the past frequency and severity of climatic anomalies, such as drought and wet periods, which in turn can be used to help anticipate the future probability of such events. Providing sufficient knowledge to make informed decisions stops, however, far short of assuring that such knowledge will be understood, used appropriately, or used at all. The policy aspects of drought and the understandings and agreements for shared use and equitable allocations of a scarce resource are an integral part of any solution to drought emergency preparedness. Therefore, information outreach, host-country technical and policy training, regional conferences and workshops all must be a part of the dissemination of the scientific information and its integration into policies, legislation, and treaties for drought preparedness.

Who Should Attend?

Upper to middle-level decision-makers, managers, and educators who have interests or responsibilities in water or waste water resources management in Jordan. The workshop is structured for participants who have an interest in learning the applications of proxy records techniques.

Topics To Be Covered

1. Dendrochronology: History of Dendrochronology, Scientific Basis of Dendrochronology, Biological Basis of Dendrochronology
2. Chronology Development: Sample Preparation and Cross-dating Techniques

(Skeleton Plots) Ring Width Measurement, Standardization, Assessing Chronology Quality and Dendroclimatic Reconstruction

3. Applications: Precipitation Reconstruction for Southern Jordan, Standardized Precipitation Indices Reconstructed from Tree-Ring Width for the Turkish Region, Sacramento River Reconstruction, return periods of low flows, Seasonal Precipitation from Latewood Tree-Ring Width, Large-Scale Drought Variations and Periodicity of Drought
4. Techniques and Applications of other Proxy Records: Isotopes: Stable and Radioisotopes, Radioisotopes: Basic Principles, Linking Stable and Radioisotopes (Carbon) with Tree Ring Dating
5. Water and Wastewater Resources: Wastewater treatment and reuse, Water Resources Planning and System Management, Rainfall Patterns in Jordan and the Northern Badia

Program

Sunday, July 11, 2004		
Time	Topic	Presenter
8:30	Registration	
9:00	Welcoming Remarks	Hashemte U
9:30	Opening Remarks	USAID/IALC
9:45	Remarks	BRDP
10:00	Break	
10:30	Orientation to the workshop	Ramzi Touchan
11:15	IALC and the Sustainable Development of Drylands in the Middle East and Asia Project	Akram Tamimi
12:00	Lunch	
1:30	Fieldtrip to Debin for scientific wood sample collections	Ramzi Touchan, David Meko, and Ali El-Naga
Monday, July 12, 2004		
9:00	Dendrochronology	Ramzi Touchan, David Meko and Ali El-Naga
12:00	Lunch	
1:30	Sample Preparation and Cross dating Techniques lab	David Meko and Ramzi Touchan
5:00	End of Lab	
Tuesday, July 13, 2004		
9:00	Standardization: Assessing Chronology Quality Applications	David Meko and Ramzi Touchan
12:00	Lunch	
1:30	Lab Session	David Meko and Ramzi Touchan
5:00	End of Lab Session	
Wednesday, July 14, 2004		
9:00	Lab Session	David Meko and Ramzi Touchan
12:00	Lunch	
1:30	Techniques and Applications of other Proxy Records for Applications in Conservation and Sustainable Development of Water Resources	Nizar Abu Jaber
5:00	End of Lectures	
Thursday, July 15, 2004		
9:00	Wastewater treatment and reuse	Bashar Al-Smadi
10:00	Water Resources Planning and System Management	Iyad Hussein
11:00	Rainfall Patterns in Jordan and the Northern Badia	Omar Rimawi & Rakad Taani
12:00	Lunch	
1:30	Workshop Evaluation, Certification Awards and Closing Ceremonies	

Appendix B

Workshop Certificate, Agreement and Evaluation Form



This is to certify that **Salah Awad Al-Khorman** has completed a training course on

Sustainable Water Resources Management:

The Role of Proxy Records in Understanding Drought and its Influence on Reclaimed Water Resources

Held at

Hashemite University, Jordan

July 11, 2004 to July 15, 2004

In cooperation with

The University of Arizona: The International Arid Land Consortium

Jordan Badia Research and Development Program

The course consisted of **36 hours** of lectures, laboratory work and field trips

Hashemite University

Badia Research and Development Program

The University of Arizona

Agreement

This Agreement made this day _____ between the Jordan Badia Research and Development Program, Amman - Jordan (hereinafter called "The Employer") of the one part and the Hashemite University, Zarqa – Jordan (hereinafter called "The Contractor" of the other part); whereas the Employer is representing The University of Arizona / International Arid Land Consortium in Jordan for the project entitled: "Sustainable Development of Drylands in Asia and the Middle East: Jordan component" and since The University of Arizona / International Arid Land Consortium would like to partially support the workshop entitled: "Sustainable Water Resources Management: The Role of Proxy Records in Understanding Drought and its Influence on Reclaimed Water Resources" that will be held at Hashemite University between July 11 – July 15, 2004.

Now this Agreement witnesseth as follows:

1. The following documents shall be deemed to form and be read construed as part of this Agreement, viz.:
 - a) The Budget presented in Appendix A of this Agreement
 - b) The Workshop Brochure presented in appendix B of this Agreement.
2. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to host, facilitate, provide lecture halls, laboratories, transportation to the participants, accommodations to participants traveling from a distance that is greater than 40 Kilometers from Amman, lunches, refreshments during breaks, printing of 100 copies of the workshop Brochure, supplying bags with logos, providing photocopies of workshop materials and pay the local lecturers stipend.
3. The Employer hereby covenants to pay the Contractor in consideration of providing the services and tasks listed in item 2 above.
4. All payments shall be made in US\$.
5. Payments by the Employer to the Contractor will be made after the cost is billed by the Contractor and the Employer sends an invoice to The University of Arizona / International Arid Land Consortium and the money is transferred to the Employer's account from The University of Arizona / International Arid Land Consortium.
6. This Agreement was prepared in Three copies. The Contractor was given one copy to implement the Contract accordingly, and the Employer kept one copy

for his records and sent the last copy to The University of Arizona / International Arid Land Consortium.

In witness whereof the parties hereto have executed this Agreement, the day and year first above written.

For and on behalf of the Contractor: The
Hashemite University

For and on behalf of the Employer: Badia
Research and Development Program

Appendix A

Workshop Budget

Workshop Budget

Item	Estimated Cost (US\$)
Lunches for 4 days for 20 persons. Lunches for the first day, July 11 will be provided by the Hashemite University. Lunches estimated at JD5 for each person per day. Price includes refreshments during breaks for the 5 days of the workshop	US\$600.00
Jordanian Lecturer's stipend @ \$500 each	1,000.00
Printing Workshop Materials	200.00
Misc.	100.00
Total	US\$1,900.00

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Sustainable Water Resources Management:

The Role of Proxy Records in Understanding Drought and its Influence on Reclaimed Water Resources

Sunday, July 11, 2004 To Thursday, July 15, 2004

Hashemite University, Zarqa, Jordan

Workshop Evaluation Report

- Please fill the following questionnaire to help us improve the next workshop. Do not put your name down. This is an anonymous survey. Circle the number that best represent your opinion: **1=Poor, 2=Fair, 3=Good, 4=Excellent, 5=No Opinion.**

- | | | | | | |
|---|---|---|---|---|---|
| 1) Please rate the overall quality of the lectures | 1 | 2 | 3 | 4 | 5 |
| 2) Please rate the overall quality of the labs | 1 | 2 | 3 | 4 | 5 |
| 3) Please rate the overall quality of the field trips | 1 | 2 | 3 | 4 | 5 |
| 4) Please give a rating of overall satisfaction | 1 | 2 | 3 | 4 | 5 |

- Give the 3 areas that you feel were the best part of the workshop. (Please explain why)

- 1) _____
- 2) _____
- 3) _____

- Give the 3 areas of the workshop that need additional improvement. (Please explain why)

- 1) _____
- 2) _____
- 3) _____

- Would you recommend to a colleague to come on a similar workshop, if it was offered? (Please explain why or why not)

- Any other relevant comments you would like to add
