RESEARCH PROGRAM ON
Dryland Systems

CGIAR

MAY 2015

# Climate Change Scenario Modeling using Soil and Water Assessment Tool. Training report

Food security and better livelihoods
for rural dryland communities

# Summary Report

The workshop 'Climate Change Scenario Modeling using Soil and Water Assessment Tool' was held from 5th to 7th of May 2015 at Icarda office in Amman, Jordan, as part of the activities carried out by the CGIAR Research Program on Drylands Systems, North Africa and West Asia Flagship, Agro-Pastoral System. This report is one of the outputs generated by the Activity 6 - "Management of water scarcity".

The workshop has been planned by Dr. Stefan Strohmeier in collaboration with IWLMP office staff Mrs. Grace Baghdassarian and CDU office staff Mrs. Laurice Abdul-Majid. The workshop was led and guided by Dr. Raghavan Srinivasan from Texas A&M University, supported by multiple lectures from Icarda (Dr. Stefan Strohmeier and Mrs. Mira Haddad), and Jordan University (Dr. Michel Rahbeh and Dr. Maisa Shammout). Main focus of the course was on climate data use for watershed scale modelling using SWAT software. However, the mainstreamed and trained techniques can be applied for any else model or climate data analysis procedure.

On the first day of the workshop (5th of May 2015), Dr. Stefan Strohmeier, Mrs. Mira Haddad, Dr. Michel Rahbe and Dr. Maisa Shammout introduced a Jordan watershed model study (Zarqa River basin) and its link with climate change issues in Jordan. In the following days (6th -7th of May 2015) Dr. Raghavan Srinivasan demonstrated and discussed the use of available climate and General Circulation Model data. Thus, holistic watershed approach was demonstrated linking climatic pattern with watershed hydrological processes.

Targeted trainees of this workshop have been young NARS researchers with adequate hydrological background capable of applying watershed models such as SWAT. Also Icarda internal scientists participated to share experience. The workshop applicants were four Icarda project related partners from Tunisia. Based on the fruitful discussions during the workshop future collaboration and scientific research topics were defined.

# Summary information

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|---|---|
| Title of training | Climate Change Scenario Modeling using Soil and Water Assessment Tool |
| Venue | IWLMP at Icarda office Amman, Jordan |
| Dates | 5-7 May 2015 |
| Duration (days) | 3 |
| Duration (class hours, field hours) | 20 class hours |
| Participants (females, males) | Female: 1; male: 3 |

# Annexes

## A. Training detailed agenda

*Tuesday, 5th of May, from 10.00 AM to 3.30 PM*

| | |
|---|---|
| 10.00 AM | SWAT workshop opening by Dr. Halim Ben Haj Salah, Coordinator of ICARDA - West Asia Regional Program |
| 10:15 AM | Welcoming, participant's and performer's introduction |
| 10.30 AM | Introduction to the Zarqa River Basin case study<br>Objective, challenges and data preparation<br>(Performer: Research staff from ICARDA and University of Jordan) |
| 12.00 AM | Lunch break |
| 01.00 PM | SWAT model execution and performance assessment (using SWAT-CUP)<br>(Performer: Research staff from ICARDA and University of Jordan) |
| 02:30 PM | Climate data analysis of Zarqa River Basin data<br>Discussion and conclusions as a basis for climate change modeling<br>(Performer: Research staff from ICARDA and University of Jordan) |
| 03:30 PM | Finish |

*Wednesday, 6th of May, from 09:00 AM to 03:30 PM*

| | |
|---|---|
| 09.00 AM | General introduction to climate change<br>General introduction to online sources of global climate and GCM CC data<br>General introduction to CC modeling<br>(Performer: Dr. Srinivasan, Texas A&M University) |
| 10:30 AM | Coffee break |
| 10:45 AM | SWAT weather generator and weather data editing<br>Demonstration for Zarqa River Basin project<br>(Performer: Dr. Srinivasan, Texas A&M University) |
| 12:00 AM | Lunch break |
| 01:00 PM | Rainfall and runoff processing in SWAT (equations and effects)<br>Potential adjustment parameters for sub-daily processes in SWAT (qPeak, Tc, ..)<br>Demonstration for Zarqa River Basin project<br>(Performer: Dr. Srinivasan, Texas A&M University) |
| 02:00 PM | Coffee break |
| 02:15 PM | SWAT GCM bias correction tool<br>Demonstration for Zarqa River Basin project<br>(Performer: Dr. Srinivasan, Texas A&M University) |
| 04:00 PM | Finish |

*Thursday, 7th of May, from 09.00 AM to 03.30 PM*

| | |
|---|---|
| 09.00 AM | Discussion Zarqa River Basin project<br>Comparing SWAT GCM bias correction results with local ground station trends<br>(Performer: Dr. Srinivasan, Texas A&M University, and ICARDA scientists) |
| 10.30 AM | Coffee break |
| 10.45 AM | Discussion of potential CC adaptation strategies and their application in SWAT<br>Demonstration for Zarqa River Basin project<br>(Performer: Dr. Srinivasan, Texas A&M University) |
| 12.00 AM | Lunch break |
| 01.00 PM | Discussion round – participants present their case studies and challenges<br>Questions and Answer between participants and lecturer<br>(Performer: Dr. Srinivasan, Texas A&M University) |
| 03.00 PM | Course finish |

# B. List of training participants

| Name | F/M | Affiliation |
|---|---|---|
| Mr. Waldi Ben Khelifa | M | INRGREF, Tunis, Tunisia |
| Dr. Hermassi Taoufik | M | INRGREF, Tunis, Tunisia |
| Mrs. Hanen Jarray | F | IRA, Medenine, Tunisia |
| Abderrahman Sghaier | M | IRA, Medenine, Tunisia |

# C. Photos


But the efforts and insights started much earlier…

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RESEARCH PROGRAM ON

# Dryland Systems

The CGIAR Research Program on Dryland Systems aims to improve the lives of 1.6 billion people and mitigate land and resource degradation in 3 billion hectares covering the world's dry areas.

Dryland Systems engages in integrated agricultural systems research to address key socioeconomic and biophysical constraints that affect food security, equitable and sustainable land and natural resource management, and the livelihoods of poor and marginalized dryland communities. The program unifies eight CGIAR Centers and uses unique partnership platforms to bind together scientific research results with the skills and capacities of national agricultural research systems (NARS), advanced research institutes (ARIs), non-governmental and civil society organizations, the private sector, and other actors to test and develop practical innovative solutions for rural dryland communities.

The program is led by the International Center for Agricultural Research in the Dry Areas (ICARDA), a member of the CGIAR Consortium. CGIAR is a global agriculture research partnership for a food secure future.

For more information, please visit

**drylandsystems.cgiar.org**

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