



Technical Report

TRAINING COURSE
ON
SALINITY MANAGEMENT
13 – 17 September, 2015
Amman, Jordan

Japan International Cooperation Agency (JICA)
and
International Center for Agricultural Research in the Dry Areas (ICARDA)



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EXECUTIVE SUMMARY

Name of the project

Capacity Development for Agriculture and Water management for Iraq and Regional countries

Partners

Japan International Cooperation Agency (JICA)

International Center for Agricultural Research in the Dry Areas (ICARDA)

National Center for Agricultural Research and extension (NCARE) - Hashemite Kingdom of Jordan

Purpose

To enhance Capacity Development of government officials and researchers who are engaged in irrigation projects and agricultural development mainly in Iraq

Specific objectives of the training course on Salinity Management

Up-to-date knowledge and enhanced capacity in salinity and the design, implementation, management, analysis, and reporting of agricultural research related to water-use efficiency, drought monitoring, and crop improvement for sustainable agricultural production.

Specific outputs

9 professionally-trained NARS partners from Iraq, 2 from Jordan and 2 from other countries: 1 from Sudan and 1 from Egypt on Improving Water Productivity in Agricultural Systems with emphasis on dry land agriculture

Specific outcomes

Design, implement, manage, analyze and report on research and development in salinity and acquire up-to-date information on research and practical activities in salinity management in each participating country.



GENERAL OVERVIEW

Water is the major limiting factor of agricultural production in the dry areas of Central and West Asia and North Africa (CWANA) regions. Agriculture accounts for around 80-90% of freshwater consumption in the regions. However, the rapidly growing population, industrialization, and urbanization will lead to reallocation of water increasingly away from agriculture to other sectors. On the other hand, high population growth rates require a continuous increase in agricultural production.

Salinity management in agriculture is interpreted differently by different entities. This often creates misunderstandings about approaches towards managing salinity (or effects of salinity) in agriculture.

Most of the salinity-affected areas in Iraq, Egypt, Jordan, Sudan and Tunisia are related to irrigation water management. Irrigation water management can either be the cause, and/or the solution to salinity management in agriculture. In countries like Jordan and Palestine, solutions to reduce salinity in saline areas are highly limited, or not economically feasible. Therefore, we approach salinity management in terms of "fighting salinity" for areas where water management is a possible tool, and "living with salinity" where we are adjusting our agronomic practices to maximize agricultural production under saline conditions. Note that one approach does not exclude the other, and that in areas of the Mesopotamian plain, as well as in the Nile Delta, a mixture of solutions from the "fighting salinity" and "living with salinity" is needed.

ICARDA's mission is to improve the welfare of people through agricultural research and training to increase the production, productivity, and quality of food, while preserving or improving the resource base. ICARDA's training courses are designed to improve the capabilities of scientists and technicians in national agricultural research systems (NARS) in developing countries to conduct research independently, and to foster transfer of technology and address issues related to farmers' decisions in adopting or rejecting new technologies. To this end, ICARDA has organized this course.

PURPOSE

The course conducted by ICARDA focused on the different approaches towards salinity management, the different conditions that guide us towards solutions, and the interpretation of solutions on long-term sustainability of agricultural production under saline conditions.

The course was developed to introduce the framework, understand the impact of the "solutions" selected for salinity management, and explain the different scales of salinity management (*see details Annex I*).

Several examples from other regions were used to explain the possible advantages and disadvantages of salinity management in the countries of Iraq, Egypt, Jordan and Palestine.



The training is an element in the approach to improve capacity of national governments to understand and implement salinity management frameworks within the capabilities of the country.

TARGETED AUDIENCE

Mid-level career managers of natural resources for agricultural production, involved in field scale, irrigation system scale, and regional scale water, land and salinity management. The focus of the course was on the Mesopotamian plain in Iraq, but the inclusion of representatives from Egypt, Jordan, Sudan and Palestine allowed for a broader discussion between participants on the possible implementations of solutions.

A total of 13 participants from four countries (Iraq, Sudan, Egypt, and Jordan) took part of the training.

Amongst them 9 trainees from Iraq, 2 from Jordan, 1 from Sudan and 1 from Egypt were supported under JICA Capacity development for agriculture and water management for Iraq and regional countries program (*see details Annex III*).

ORGANIZING COMMITTEE

Mr. Charles Kleinermann, Head, ICARDA Capacity Development Unit (CDU)

Dr. Theib Oweis, Director, ICARDA Integrated Water & Land Management Program (IWLMP)

Dr. Vinay Nangia, ICARDA, IWLMP, Course Coordinator

COURSE STRUCTURE

The course was setup to maximize the interaction of participants with the course content.

The background of the participants was homogeneous (water engineers, soil engineers, water managers and agricultural researchers) which was an asset in the discussions.

Due to the homogeneity of backgrounds, the focus of the course was on a better understanding and ability to define the problems, and to find solutions through management. Some engineering approaches were used to strengthen the concept of salt mass (and thus the long term sustainability issues).

Lecturing and discussions were to a large extent conducted by one or two experts at a time. This was designed to improve the coherency of the course, and to allow a frequent reflection on discussions held earlier in the course.

To allow interaction with other researchers from ICARDA, seven lecturers were invited to provide case studies, and to provide a detailed example from other parts of the CWANA region.



COURSE IMPLEMENTATION

The 5-day course was designed to grow into the salinity management framework approach.

The first day included an introduction at the three identified levels of salinity management: field/farm level, irrigation system level, and regional/national level. The two approaches of "living with salinity" and "fighting salinity" were introduced to allow an understanding of the term "salinity management". Salinity management as a mass balance approach was introduced to understand the difference between "managing the accumulation of salts" and "managing the effects of salinizing areas on agricultural production".

The second day was used to introduce the concepts of a salinity management framework implementation at the three management levels introduced on the first day. Based on this example, discussions were held on the potential of these approaches in the countries of Iraq, Egypt, Jordan, Sudan and Palestine. Sustainability assessments were introduced in the latter part of the day to introduce long-term visions towards proposed solutions, related to sustainability, applicable to the three scales of management.

The third day started with an overview of salt management solutions at field level, using a water and salt flux assessment. Similar to the discussions on the previous day, where mainly the national level approach was discussed, group discussions were held, and examples were given on salinity management options for irrigation districts and field levels. The day concluded with a summary and emphasis on sustainable solution-driven approaches.

The fourth day introduced the problem of salinity management under shallow groundwater conditions. This is a condition that contributes strongly to some of the saline areas in Iraq and Egypt. Examples from research in Central Asia were presented. The second part of the day was used for participants to analyze four case-studies. Four groups were formed to attempt to advise the participants from the other countries on their potential solutions. These solutions were presented in the course, and discussed on their long-term sustainability, their approach towards management salinity mass or effects of salinity on agricultural production, and methods to implement these solutions.

The last day was used to introduce the assessment and results from a project that focused on salinity management in central and southern Iraq. The analysis and proposed solutions were the result of a 5-year program between 5 international organizations, and 5 ministries of the government of Iraq. The proposed solutions were submitted at ministerial levels, and the introduction of these reports to the participants had the objective to strengthen the conclusions from participants based on the analysis exercise from the fourth day. Further discussions were held on how the thoughts and ideas developed during the course would be used in the participants' work place.



GROUP ASSESSMENT

Trainees were divided into 4 groups and were given information on agricultural sector, salinity problems and study site location to develop a 20 minute presentation to give to the given country's agriculture minister presenting a plan to solve the salinity problem. The groups of trainees were asked to present the problem, the solution, methodology, estimate of cost and time and any negative environmental effects of their planned intervention. They were to apply the knowledge gained in the training to prepare the presentations.

Drs. Usman Awan and Vinay Nangia served as judges to score the presentations.

Here is summary of group scores:

Group	Average Score	Team members
Iraq-1	3.5/5.0	Ms. Alyaa Ali Mohammed Saeed Ms. Dina Makky Ibrahim Mr. Layth Saadi Jaafar Mr. Ammar Jabbar Abdul Razzq
Iraq-2	3.5/5.0	Ms. Maha Ali Abbas Ms. Mousen Adnan Al-Kamil Ms. Shaymaa Saadoon Mutar Mr. Hatim Hameed Hussein Mr. Mohammed Sami Safi
Egypt + Tunisia	4.5/5.0	Mr. Mostafa Mohamed Zahran Mr. Tlili Abderrazak
Jordan + Sudan	4.0/5.0	Mr. Houthiafah bin Abdullah Al-Sawalemah Mr. Khalafalla Mohammed Ali Yousif

GENERAL COURSE EVALUATION by TRAINEES

Overall, the evaluation of the course by the participants was positive (*details in annex IV*). The list of the three most interesting ideas/concepts that the trainees learned in the course actually includes all course topics. This shows on one hand the heterogeneity in the scientific and professional background of the trainees but also that all topics were relevant to trainees. They stressed that the main relevant topics were on how to manage and solve salinity, solutions at irrigation, river basin and drainage, soil mixture and properties.

The trainees also suggested that the venue of the course should be in another country in order to provide practical sessions.



CONCLUSION

The participants nominated for the course were of high quality and appeared eager to participate.

The mixture between lectures and discussions appeared to work well, and the enthusiasm of the participants over the five day course appeared to remain high.

The course evaluations support the approach taken, and the pre and post knowledge assessment tests show an overall improvement in understanding the material.

This course should be seen as part of a capacity building approach of national governments towards salinity management.

With this objective in mind, the course is evaluated as successful by the lecturers. However, to actually improve water and land management for higher agricultural production and improved livelihoods under saline conditions, more follow-up activities, as well as a more coherent approach by international donors and organizations towards the national governments are needed.