

**INTERNATIONAL WORKSHOP ON
CROP AND FORAGE PRODUCTION USING SALINE
WATERS IN DRY AREAS
BIRJAND (IRAN), MAY 7-10, 2006**

***PARTICIPATING COUNTRIES:* 11 COUNTRIES (INCLUDING 7 MEMBER COUNTRIES OF THE CENTRE)**

***NUMBER OF PARTICIPANTS:* 52 SCIENTISTS AND SENIOR EXPERTS FROM 11 COUNTRIES**

Salinity of waters and soils is one of the main constraints in agricultural production. Saline water contains dissolved substances in the form of chlorides, sulphates, carbonates and bicarbonates of Calcium, Magnesium, Sodium and Potassium. Salinity can adversely affect the plant growth and crop yields. While the salts of Calcium and Magnesium tend to cluster closer to clay particles and keep the soil flocculated with fine particles binding together into aggregates, highly saline and sodic water can cause problems in irrigation, depending on the type and amount of salts present, soil type being irrigated, specific plant species and growth stage, and the amount of water able to pass through the root zone. Salinity becomes a problem when excess salts accumulate in the root zone thus hindering the plant roots from withdrawing water from surrounding soil. Sometime visual symptoms (leaf burn, necrosis and defoliation) occur, particularly in woody species, but at high levels, salinity can cause physical damage and mortality.

Most crops are relatively tolerant to salinity during germination but young developing seedlings are more vulnerable to salinity damage during emergence and early development. For the developing countries, specifically where most of the land is facing rapid desertification, scarcity of good water for irrigation and soil salinity are the major problems for crops. The use of saline water and salt tolerant plants in combination with certain practices like careful application of available water, domestication of halophytes, agro-ecosystems, farm management and efficient irrigation systems presents valuable opportunities for developing countries, thereby ensuring benefits for the economic production of resource plants and their products.

With a view to upgrade the knowledge and skills by making the relevant information easily accessible to researchers, agriculturists, extension workers, planners and policy makers to utilise it profitably in the diagnosis, improvement and exploitation of saline water irrigated agriculture, the Centre for Science and Technology of the Non-Aligned and other Developing Countries (NAM S&T Centre) organised an international workshop on 'Crop and Forage Production using Saline Waters in Dry Areas' during 7-10 May, 2006 at Birjand in the Islamic Republic of Iran jointly with the Birjand University. As the national capacity and strengths of the NAM and other developing countries differ from one country to another, the exchanges between the participants from various countries during the event well complemented each other.

After the recitation from Holy Qur'an and the National Anthem Mr. S. S. Mortazai, Governor General of South Khorasan Province of Iran inaugurated the workshop. This was followed by the remarks from Dr. Hashemi, Deputy in Research, University of Birjand; Prof. Mohammad Kafi, Head of the Education and Science Wing in the Embassy

of the I. R. Iran in New Delhi, India; and Prof. Arun P. Kulshreshtha, Director, NAM S&T Centre.

52 scientists and senior experts from 11 countries, which included **Afghanistan** [Mrs. Maliheh Ghafoori of the Ministry of Agriculture], **Cuba** [Dr. Aurelio Álvarez Menéndez, Director, Pastures and Forages Research Institute, Ministry of Agriculture], **Germany** [Prof. Helmut Lieth, International Ecological Projects, Institute of Environmental Systems Research, University of Osnabruck], **India** [Prof. Rakesh Kumar Trivedy, Head, Dept. of Environmental Science, University of Pune and Dr. Balram Sharma, Ex-Head, Division of Genetics, Indian Agricultural Research Institute, Delhi], **Indonesia** [Prof. Benyamin Lakitan, Minister's Advisor for Food Affairs, Sriwijaya University], **Kuwait** [Mr. Faisal Yousif Ali-Sadeeki, Director, Research & Nurseries Administration and Mr. Faisal H. Aseery, Experiment & Laboratory Division, Abdaly Agriculture Administration], **Myanmar** [Ms. Lae Yin Win, Assistant Lecturer, Biotechnological Department, Government Technological College, Yangon], **Pakistan** [Prof. Mohammad Ajmal Khan, Department of Botany, University of Karachi], **Qatar** [Prof. Yassin Ibrahim, Department of Biological Sciences, College of Arts & Sciences, Doha and Mr. A. Salam Al-Harbi, Head, Research Station for Crops and Wild Plants, Dept. of Agriculture & Water Research, Doha], **Sri Lanka** [Dr. Amarasinghe Arachchige Yasarathna Amarasinghe, Dean, Faculty of Agricultural Science, Sabaragamuwa University] and the host country **Iran** (38 participants) attended the workshop.

Prof. H. Lieth, Prof. Ajmal Khan, Dr. Balram Sharma, Dr. Hossain Tavakoli (Head, Agriculture and Natural Resources Research Center, Khorasan) and Dr. S. A. M. Cheraghi (Director, National Salinity Research Centre) were the principal key speakers during the workshop. Most of the foreign participants presented their respective country status reports; the report on Iran was presented by Prof. Mohammad Kafi; and Dr. Seyed Jalal Rastegari (Head of Salinity Research at the Nuclear Research Centre for Agriculture and Medicine of the Atomic Research Organisation), Dr. M.S. Saberi (Agriculture and Natural Resources Research Center, Khorasan), Dr. Ahmad Riasi, Dr. Karimi and Dr. Rangbar (all from the Iranian research centres and universities) were the Iranian participants, who presented scientific papers on the subject.

The workshop was organised in seven technical sessions that were chaired by, respectively, Dr. Balram Sharma / Dr. Hossain Tavakoli; Prof. Ajmal Khan / Prof. Mohammad Kafi; Prof. Yassin Ibrahim / Dr. Gholam Reza Zamani (Birjand University); Prof. Benyamin Lakitan / Dr. Homayoun Farhangfar (Veterinary Department, Birjand University); Prof. Dr. Helmut Lieth / Dr. Majid Jami Al-ahmadi (Agronomy & Plant Breeding Department, Birjand University); Prof. Arun Kulshreshtha / Dr. Mohammad Ali Behdani (Agronomy Department, Birjand University); and Dr. A. A. Y. Amarasinghe / Dr. Ebrahim Rowghani (Head, Animal Sciences Department, Shiraz University).

The concluding session was devoted to consolidating on various issues concerning the topic of the event and was held in the form of a panel discussion with Prof. H. Lieth, Prof. Ajmal Khan, Dr. Balram Sharma, Prof. B. Lakitan, Dr. A. Álvarez Menéndez, Prof. M. Kafi and Dr. A. A. Y. Amarasinghe being the panellists. The high spot of the workshop was the Birjand Declaration, a copy of which is appended at the end of the report, after which the Certificates of Participation were awarded to the participants.

After the meeting a halophyte group was created at the University of Birjand (<http://groups.yahoo.com/group/halophytes>) by Dr Majid Jami Al-Ahmadi to coordinate the research activity of halophyte biologists from both developing and developed countries. This group was also adopted by the International Society for Halophyte Utilization (ISHU) for the patronage and support. About 50 scientists all over the world have become its member and the membership is growing rapidly. The contribution of the NAM S&T Centre and Birjand University is already making the difference and it is hoped that this coordination would lead to enhanced collaboration among member countries.

Several participants visited the Carbon Sequestration Project site at Hossein Abad region of the South Khorasan Province. It is a joint programme of the Government of Iran and UNDP/GEF being executed by the Bureau of Sand Dune Fixation and Combating Desertification of the Forests, Rangeland and Watershed Management Organisation. This project of 6 years duration (2003-09) with a total budget of US\$1.7 Million is designed to find sustainable and cost-effective ways to rehabilitate the degraded land areas in Iran that would sequester Carbon both above as well as below the ground, i.e. in the plants as well as in the soil and is aimed at not only increasing the carbon absorption capacity of the degraded rangelands, but also reducing the poverty of the local communities.

The foreign participants were also taken around on cultural visits in Birjand (Museum, Pavilion, Fort, Aminabad Garden, etc.) and Nazdasht village, which were organised by Mrs. Sholeh Ghollassi, Dr. Gholam Reza Zamani, Dr. Majid Jami Al-Ahmadi and their colleagues at the Birjand University.

Birjand Declaration

The rapid population growth in the less developed countries of arid and semiarid regions and concomitant decline in productivity of agricultural lands due to shortage of good-quality irrigation water and increasing soil salinity are exerting enormous pressure on the dwindling supplies for human consumption. Equally or even more affected in some cases are other resources like fodder for animals and fuel wood for the rural poor.

False irrigation practices have caused water logging to prime agricultural lands and extensive utilization of underground resources in dry areas has caused the substantial depletion of underground water resources. This has created serious scarcity of fodder and water for other agricultural usages. It is becoming increasingly difficult to grow any conventional crop in areas where they were planted before and therefore it is necessary to look for alternate solutions.

To share ideas and experiences of scientist from various countries an **"International Workshop on Crop and Forage Production Using Saline Water in Dry Areas"** was organized on May 7-10, 2006 at the University of Birjand, Iran with the collaboration of the Centre for Science and Technology of the Non-Aligned and Other Developing Countries. More than 50 scientists from 11 countries have participated in this workshop and they agree on the following:

1. Salinization of soil and water resources and management is of great importance. Therefore governments should consider it as a serious challenge.

2. Comprehensive plans for sustainable use of saline waters and halophytes are needed for each region.
3. The conventional water resources and crops do not meet the requirements of human society in dry and saline areas. The new source of water (seawater and/or brackish) and new crop (salt tolerant plants) should be considered for research.
4. This is a global problem therefore there is a need to create national authorities and international funds and collaboration for the management of saline lands.
5. Holding workshops and conferences for exchange of experiences and ideas is highly recommended.
6. The Iran already has a strong human base of the research on saline agriculture. However, coordination among various government agencies and academia is not sufficient. Therefore an aggressive plan may be made to increase collaboration and planning for saline agriculture.
7. International collaboration may be encouraged and financed at the government's levels to make valuable contributions both locally and globally.
8. It is also suggested that the NAM S&T Centre may play a central role in organizing bio-saline agriculture development in the member countries.
9. It is suggested that the different scientific disciplines should cooperate in the solution of sustainable and economically feasible management of saline systems.