

Biosalinity News

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FROM THE EDITOR

Bangladesh has been in the news recently because of the devastating floods that have affected the country. Many low-lying coastal areas flooded during the monsoon face the additional problem of salinity caused by poor drainage and inundation of sea water. Over 0.88 million hectares in Bangladesh are estimated to be affected by salt. Concerted efforts are being made to combat the problem and the Focus on Salinity section in this issue of *Biosalinity News* describes two projects which are directly aimed at helping farmers in salt-affected areas of Southern Bangladesh.

Encouragingly, this issue also shows that across the region, and even further afield, many of us are working towards the same goal: using saline water and land resources sustainably and productively. From Niger in the west, through self-proclaimed 'Somaliland', the WANA countries, Southern Asia, to Australia in the east, interest in biosaline agriculture is growing.

Private sector interest in biosaline agriculture is also on the rise, and we hope the recent seminar focusing on biosaline agriculture products from field to market has stimulated this interest.

Finally, a reminder that The Editor welcomes short contributions that would be of interest to readers.

Please send your submissions to:

The Editor

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Profits from salinity: a seminar for investors



Dr. Abdul Aziz Khelef, Islamic Development Bank (left), addressing the seminar 'Biosaline Agriculture: Challenges and Opportunities for Products from Field to Market' and (right) the session 'Biosaline products and technologies'

Bridging the gap between the development of new technologies and the implementation of these technologies by the private and public sectors is a major challenge for research organizations. Taking up the challenge, ICBA and the United Arab Emirates Ministry of Agriculture and Fisheries held a seminar on 'Biosaline Agriculture: Challenges and Opportunities for Products from Field to Market', to bridge this gap and bring together scientists and investors.

Salinity, whether of water or soil, has always been seen as a problem. The seminar, held in the Dubai Chamber of Commerce and Industries on 7 June, gave investors insights into opportunities for investing in profitable enterprises using salty water and salty land resources. The seminar showcased the new technologies in biosaline agriculture now offering possibilities for turning salinity problems into opportunities and making use of hitherto unused saline water and land resources. The invited speakers, scientists and chief executive officers of biosaline enterprises from USA, Australia, The Netherlands, Eritrea, India, Pakistan and the UAE gave examples of success stories ranging from production of gourmet salads, to animal fodder and turfs for golf courses. Dr. Wouter van Dieren, President, Ocean Desert Enterprises, Amsterdam, gave the keynote lecture.

At the seminar lunch, biosaline agriculture food products, including lamb raised at the United Arab Emirates University Farm on salt-tolerant grass hay, were served. Also on the menu were dishes of *Salicornia*, a gourmet salad commonly known in Europe and the United States as samphire, glasswort, sea bean and sea pickle.

The seminar was attended by nearly 200 VIPs, ministers, government officials, executives from agricultural investment companies, as well as representatives of local, regional and international research institutes and universities. Held under the patronage of HH Sheikh Hamdan Bin Rashid Al-Maktoum, Deputy Ruler of Dubai and Minister of Finance and Industries, United Arab Emirates, the seminar was sponsored by the Dubai Chamber of Commerce and Industry, Nakheel, the Dubai Islamic Bank, the Arab Authority for Agricultural Investment and Development, and the Inter-Islamic Network on Biosaline Agriculture.

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ICBA LINKAGES AND PARTNERSHIPS

ICBA links with premier Australian research organization

ICBA and the premier Australian research organization, the Commonwealth Scientific and Industrial Research Organization (CSIRO), have signed a Memorandum of Understanding to cooperate in biosaline agriculture.

The MOU was signed at ICBA headquarters, Al Ruwwayah, Dubai, by Prof. Dr. Faisal Taha, Director Technical Programs, ICBA, and Prof. Shaun Coffey, Chief, CSIRO Livestock Industries, in the presence of HE Mr Noel Campbell, Australian Ambassador, and ICBA senior staff.

Prof. Shaun Coffey, on behalf of the Chief Executive Officer and the Chair of the Board of CSIRO, said he was delighted to establish the relationship with ICBA. He said that the issues of salt, salinity and biosaline agriculture are three areas of commonality for ICBA and CSIRO. Although the contexts for ICBA's and CSIRO's work are different, the solutions developed by the two organizations are common to the different environments.

The signing of the MOU marks the beginning of the relationship between ICBA and CSIRO and both are



From left to right: Mr. Jugu Abraham and Prof. Dr. Faisal Taha, Director Technical Programs, ICBA, Prof. Shaun Coffey, Chief, CSIRO Livestock Industries, and HE Mr. Noel Campbell, Australian Ambassador to the UAE, at the signing of the MOU

moving quickly to develop joint project activities and seek support from funding agencies.

ICBA and CSIRO will cooperate in biosaline agriculture and other areas of scientific research and development of interest to ICBA in which CSIRO has expertise. Potential fields of cooperation include sustainable irrigation systems; dryland salinity; evaluation of salt and drought tolerance; plant breeding and productivity; salinity management in integrated catchments; Serial Biological Concentration of Salts (SBC); and commercial, farm and amenity forestry for saline environments.

ICBA partners with Saudi Arabia private sector in biosaline agriculture R&D

ICBA and the leading Saudi Arabian prawn culture enterprise, National Prawn Company, recently signed a Memorandum of Understanding to cooperate in biosaline agriculture.

The MOU was signed by Dr. Mohammad Al-Attar, Chairman, Board of Directors and Director General, ICBA, and Engineer Ahmed Al-Balla, General Manager, National Prawn Company.

The MOU follows a visit by Engineer Al-Balla to ICBA headquarters earlier in the year. Engineer Al-Balla inspected developments in biosaline agriculture in ICBA's experimental fields and, as a result, invited an ICBA team to visit the National Prawn Company inte-

grated shrimp farming project on the desert coast of the Red Sea in Saudi Arabia to evaluate the potential for using saline waste water from the prawn ponds for biosaline agriculture.

The MOU with National Prawn Company is an important partnership between ICBA, an international non-profit organization, and the private sector, in research and development on biosaline agriculture.

The private sector recognizes that salty water can be used to grow profitable crops, such as salt-tolerant grass hay to feed sheep and goats or salt-tolerant shrubs and

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Dr. Mohammad Al-Attar, Chairman, Board of Directors, and Director General, ICBA, and Engineer Ahmed Al-Balla, General Manager, National Prawn Company, signing the MOU on the occasion of the seminar 'Biosaline Agriculture: Challenges and Opportunities for Products from Field to Market' 7 June 2004



ICBA Chairman Board of Directors and Director General, Dr. Mohammad Al-Attar, and ICBA Director Technical Programs, Dr. Faisal Taha, examining the model of the National Prawn Company integrated prawn farming project on the Red Sea coast of Saudi Arabia

trees for wood and fiber products. Companies in the region also recognize that there are many salt-tolerant ornamental plants that can be used to create green and pleasant residential complexes and working conditions for their staff in harsh desert environments.

The National Prawn Company uses eco-friendly, sustainable culture systems to produce and market shrimp of international quality. The National Prawn Company has invested 22 years of dedicated Research and Development and experimentation to establish and prove the economic viability of prawn culture on the desert coast of the Red Sea. The company, based in Al Lith, Kingdom of Saudi Arabia, is one of the largest wholly integrated desert coastal aquaculture projects in the world and a global producer of prawns.

Both ICBA and the National Prawn Company have common objectives in contributing to sound management of natural resources through technologies such as biosaline agriculture which optimize the use of saline water and saline land resources.

Areas of cooperation include utilization of return seawater for producing halophyte forage crops, environmental beautification, biomass energy and organic fertilizers; expansion of mangrove plantations; investigations on halophyte ground covers for controlling erosion of dikes; consultancy on management of biosaline agriculture, soil-water ecosystems and other environmental concerns; and other activities of mutual interest related to forage production, coastal greening, utilizing salt-tolerant plants and saline irrigation water.

Agreement provides INRAN, Niger, and ICBA with umbrella for joint activities

Farmers in Niger, West Africa, are threatened by increasing salinity and waterlogging on their land due to lack of knowledge of appropriate irrigation techniques. The national agricultural research institute of Niger, the Institut National de Recherches Agronomiques du Niger (INRAN), and ICBA recently signed a Memorandum of Understanding that provides an umbrella for developing joint technology exchange activities to address salinity problems in Niger.

Activities will focus on strengthening of the capacity of INRAN to deal with salinity problems and will include a training course in Niger, internships at ICBA and pilot projects to demonstrate biosaline agriculture technologies.

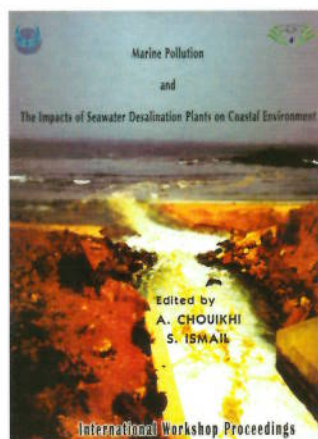
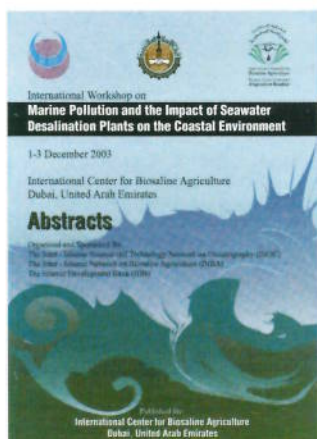


Artesian water with salinity of 6.0-6.7 dS/m at Kizamou, Niger

INTER-ISLAMIC NETWORK ON BIOSALINE AGRICULTURE (INBA)

New INBA publications

Two new INBA publications are now available, the Abstracts and Proceedings of the International Workshop on Marine Pollution and the Impact of Seawater Desalination Plants on the Coastal Environment. For further information, contact Dr. Shoaib Ismail, INBA Coordinator, ICBA. Email: inba@biosaline.org.ae



Private Office of HH President of the UAE contributes to ICBA and INBA

In April 2004, the Private Office of HH President of the UAE provided US\$400,000 to ICBA as one-time unrestricted funding. In addition, the sum of US\$50,000 was provided for funding of the Inter Islamic Network on Biosaline Agriculture (COMSTECH) for the year 2004.

INBA co-sponsors seminar for potential investors in biosaline agriculture

INBA was a co-sponsor of the seminar 'Biosaline Agriculture: Challenges and Opportunities for Products from Field to Market' held at the Duabi Chamber of Commerce and Industry in June (see article on Page 1).

PROJECT WORKSHOP

Workshop on assessment of saline water resources in four WANA countries

A workshop for the project 'Harnessing Salty Waters to Enhance Sustainable Livelihoods of the Rural Poor in Four Countries in West Asia and North Africa (WANA): Egypt, Jordan, Syria and Tunisia' was held at ICBA headquarters, Al Ruwwayah, Dubai, 28-29 June.

The US\$75,000 project, a component of the global Comprehensive Assessment of Water Management in Agriculture, is one of eight projects selected for funding under the Comprehensive Assessment Competitive Research Grant Scheme supported by the Governments of The Netherlands and Switzerland, and coordinated by the International Water Management Institute (IWMI), Colombo, Sri Lanka.

Although the salinization of groundwater resources in the West Asia and North Africa region is widely recognized, detailed information on the extent and rate of increase of salinization are scattered and often unreli-

able. Despite the lack of data, the experts from Egypt, Jordan, Syria and Tunisia participating in the workshop were able to identify areas in their respective countries where there is potential for biosaline agriculture to improve the livelihoods of the poorest farmers.

Outputs of the project, which will be completed in December 2004, will provide information on saline groundwater resources in each country, identify areas where saline water occurs and the poorest farmers live, and assess the potential for saline irrigated agriculture to contribute to poverty alleviation, food security, and environmental security.

Reports on the four countries, a report synthesizing the main findings, and a policy brief will be published. The methodology developed in the project will be a model for similar studies in other countries.

RESOURCE MOBILIZATION

IFAD approves US\$1.35 million for multi-country salt-tolerant forage project

The IFAD Board at its April meeting approved funding for the multi-country, multi-donor project to grow forage with saline water on marginal land in the West Asia and North Africa (WANA) region led by ICBA.

Following acceptance of the concept note in September 2003 and a presentation by ICBA's Technical Team and the Donor Relations Specialist to IFAD in Rome, November 2003, IFAD provided US\$21,000 for a design mission. The design mission included Jordan and Palestine (January 2004), Pakistan (December 2003), Syria (February 2004), Tunisia (January 2004) and Oman (December 2003) where ICBA scientists met and consulted with national scientists and institutions to seek their inputs and assistance in developing the proposal. The proposal was finalized and submitted to IFAD in February 2004. At their April 2004 Board meeting, IFAD approved a grant of US\$1.35 million over 4 years for the project.

Decisions on implementation at different sites and the sequence of testing of species will be made at the project planning meeting to be held in October.

IDB funds ICBA's first External Program and Management Review

The Islamic Development Bank (IDB) has commissioned the Center's first External Program and Management Review to provide ICBA's sponsors with an independent and rigorous assessment of the Center's institutional health and contribution, and to pave the way for the development of ICBA's second Strategic Plan.

The IDB has provided a Technical Assistance Grant to cover the costs of the Review and the development of the second Strategic Plan.

The Review Panel comprises three members and a Secretariat. Dr. Donald Plucknett, Chairman of the Panel, is President and Principal Scientist, Agricultural Research and Development International, USA. Panel

Arab Fund contributes US\$1 million for implementation of salt-tolerant forage project in six WANA countries

Further support for the salt-tolerant forage project came with the approval by the Arab Fund for Economic and Social Development of a grant of US\$1,000,000 over four years to support implementation in Jordan, Palestine, Oman, Syria, Tunisia and the United Arab Emirates.

The Arab Fund for Economic and Social Development (AFESD) is an autonomous regional Pan-Arab development finance organization. AFESD assists the economic and social development of Arab countries through, firstly, financing development projects, with preference given to overall Arab development and to joint Arab projects; secondly, encouraging the investment of private and public funds in Arab projects; and, thirdly, providing technical assistance services for Arab economic and social development.

The Arab Fund is a major investor in ICBA, having provided substantial grants towards the installation of the irrigation and drainage system network at ICBA HQ.

Member, Dr. Shawki Barghouti, is the Advisor, Agricultural Science and Technology and Portfolio Management, World Bank. The third Panel Member, Professor Philip Cocks, has recently retired from his post as CEO Cooperative Research Centre for Plant-Based Management of Dryland Salinity, University of Western Australia. Dr. Pammi Sachdeva of the World Bank provides the Secretariat for the Panel.

The Panel began the Review in June when members met with ICBA's Board, management and staff at ICBA HQ, and the IDB in Jeddah. Field visits and main phase of the Review will take place in September, and in October the External Review Report will be presented to the ICBA Board of Directors in Dubai, and the ICBA Board of Trustees in Jeddah.

FOCUS ON SALINITY

Managing salinity in Southern Bangladesh

Md. Nural Islam, Superintending Engineer, Integrated Water Resources Management (nislam@lged.org), and Dr. Quai Rezaul Islam, Agronomist, Second Small Scale Water Resources Development Sector Project, Local Government Engineering Department, Dhaka, Bangladesh

In tidal flooded areas of Southern Bangladesh, poor drainage of salt-water severely restricts crop production. To address this problem, the Local Government Engineering Department (LGED) has implemented several sub-projects in the Small-Scale Water Resources Development Sector Project aiming at poverty reduction through sustainable management of small-scale water resources. The International Fund for Agricultural Development funded the first phase of the project with the Asian Development Bank, Government of the Netherlands, and the Government of Bangladesh. Project beneficiaries contribute all the operational and maintenance costs. The project improves employment opportunities through the construction of water control infrastructure, increased agricultural and fisheries production, and mobilization of local resources.

Bagachra Badurgacha, one of the sub-projects, is located in the Dumaria sub-district of Khulna District in the southwest of Bangladesh, and is bounded by the Ghangrail River on the south and west, and the Teligati River on the north and east. The sub-project covers 375 hectares of which 93% is cultivated. All the cultivable land is low lying: 90% is flooded to depths of more than 1.8 meters and 10% is flooded to depths of between 0.9 and 1.8 meters.

The cropping pattern in the project area consists of a single rice crop each year grown in the monsoon season compared to the three crops grown each year in other parts of the country. Late planting after the onset of the monsoon, use of low-yielding indigenous varieties, and increasing salinity in the post-monsoon period, reduce yields of rice. Crops other than rice cannot grow.

Landowners are mainly marginal and small farmers, some of whom rent their land to entrepreneurs for shrimp production. However, the rental income is



Demonstration of high-yielding rice production in Jabusha Sub-project, Khulna District, southern Bangladesh

meager. Moreover, flooding of the land with saline water for shrimp production year after year destroys soil productivity, and damages the habitat and the environment.

In 2000, re-sectioning of 9.8 km of embankments and construction of two water control structures or regulators by the LGED helped protect the sub-project area from salt-water flooding and reduce soil salinity. These interventions have improved rice and fish production. Farmers have adjusted their planting regime to produce rice after the shrimp. The timing of transplantation and application of fertilizers at the recommended rates have more than doubled rice yields and the area of rice grown has increased by 19.5%. In addition, the decrease in soil salinity has helped farmers to diversify into non-rice crops during the dry season.

The water-control structures have been designed with a low head to be 'fish-friendly' and allow fingerlings to enter the canals during the monsoon when salinity levels are low.

The increase in the cropped area, use of improved crop varieties and improved crop management require more labour and provide employment opportunities. Farm labour has increased by 28.5%. Similarly, the introduction of shrimp culture, adoption of modern technology, and tree plantation along the re-sectioned embankments, provide further opportunities for employment, particularly for destitute women, and have resulted in an overall increase in wage levels. This has significantly reduced poverty in the sub-projects area.

Demonstration of biosaline agriculture in salt-affected areas in Bangladesh

In the Noakali and Sonagazi districts of Southern Bangladesh, ICBA and the Bangladesh Agricultural Research Institute (BARI) are working on another project to address the problem of salt-affected land. The three-year project is aimed at increasing production of cash crops in the coastal saline zone. The ultimate goal is to raise farmers' incomes through improving irrigation, drainage, soil and crop management techniques.

The average annual rainfall in this area is estimated at 3,000 mm, mostly falling in the monsoon season, starting in June. During the dry months of March and April, salinity problems are acute as a result of seawater intrusion into low-lying agricultural land in coastal areas.

ICBA and BARI are demonstrating that profitable cash crops, such as mustard and tomatoes, can be grown successfully in these coastal areas in the dry season with appropriate management of soil and water. Demonstrations show farmers how to use technologies such as drip irrigation on raised beds to ensure adequate leaching of salts from the root zone.

Demonstrations of the production of cash crops using raised bed techniques and introduce appropriate techniques for soil and water management have been set up at experimental sites in Noakhali and Sonagazi.

Four crops, tomato (var: Ratan), chili (var: BARI Lanka-1), barley (var: BARI Barley-4) and mustard (var: BARI sharisha-6) are being investigated. Tomato and chili are being grown under (i) drip irrigation and raised beds, (ii) ridge, furrow and (iii) no irrigation treatments. Barley and mustard are being grown with (i) furrow irrigation, and (ii) bed, furrow and no additional irrigation, which is the common practice amongst farmers in Bangladesh. Yield is being measured for each treatment along with periodic measurements of soil salinity.

In March a field day attracted over 100 farmers, extension workers, NGO representatives, and BARI scientists. Participants inspected the experiments in the field and saw for themselves the contrast between the experimental area and the surrounding fields left fallow due to salinity.



Farmers inspecting tomatoes grown on raised beds with drip irrigation on saline soil at the field day, Noakhali, 24 March



Dr. Bassam Hasbini, Irrigation Management Specialist, ICBA, and BARI scientists inspecting dripper discharge to chili



Farmers commenting on the demonstrations at the field day

After the field inspections, participants listened to presentations by Bangladesh Agricultural Research Institute (BARI) Director General, Dr. Shahidul Islam, Dr. Stuart P. Pearson, Team Leader, CDSP, and ICBA project coordinator, Dr. Bassam Hasbini, and discussed the benefits of the new technologies for helping solve problems faced by poor farmers.

CAPACITY DEVELOPMENT

Joint ICBA-Iranian workshop

ICBA, and the Bank of Keshavarzi, Islamic Republic of Iran, held a joint workshop on 'Principles and Application of Biosaline Agriculture in Arid and Semi-Arid Regions with Reference to Iran' in Babolsar, from 14-15 April.

Participants at the workshop exchanged information on research and development in biosaline agriculture and discussed problems of salinity and directions for future collaborative work. Over 60 representatives from the Agricultural Research and Education Organization (AREO) for Education and Manpower Development, Iran, the Ministry of Jihad-e-Agriculture, Iran, the Agricultural and Natural Resources Research Center of Mazandaran, Iran, and the Bank of Keshavarzi, Iran, attended. Iranian research and development organizations have undertaken extensive work on the salt-tolerance of crop species, management of saline water and rehabilitation of saline soils and it is hoped that the workshop will pave the way for many collaborative activities.

The presentations by ICBA staff illustrated ICBA's work in developing sustainable biosaline agricultural systems, the role of ICBA in coordinating research in biosaline agriculture, and in disseminating information on biosaline agriculture through collaborative projects in arid and semi-arid regions.

Bank Keshavarzi, a government bank, is the main source of agricultural credit in Iran.



Participants of the workshop, Babolsar, Iran, April

'Somaliland' program managers introduced to salinity issues



Dr. John Stenhouse, Genetic Resources Scientist, ICBA, explaining screening procedures for salt-tolerant crops to Mohammed Yonis and Sulub Aman

Two Community Development Officers, Mohammed Yonis and Sulub Aman, of the Northwestern Integrated Community Development Program (NWICDP) in self-proclaimed 'Somaliland', participated in a four-day intensive interactive introduction to agronomic practices and crops for successful agricultural production in saline conditions at ICBA in March.

NWICDP is financed by the Belgian Survival Fund (BSF) Joint Program with the International Fund for Agricultural Development (IFAD), and the project is executed by the United Nations Office for Project Services (UNOPS) under IFAD's supervision. The overall goal of NWICDP is to improve food security, nutrition and rural incomes, targeting communities in the Gabiley and Boroma districts in the northwest of 'Somaliland'. Among its objectives, the program seeks to improve crop husbandry and farming systems. Salinity is a major challenge particularly in the dry seasons.

ICBA tailored the learning experiences to the specific needs of the two Community Development Officers and the IFAD project. For four days Mohammed and Sulub interacted closely with ICBA's international staff to address the particular problems of salinity in 'Somaliland'.

Funds for the training were provided by NWICDP.