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Research and Development at ICBA

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BIOSALINITY NEWS

Conference on the Use of Treated Wastewater in the Agricultural Production in the Arab World: Current Status and Future Propsective

**Under the patronage of H.H. Sheikh Hamdan bin Rashid Al Maktoum
Deputy Ruler of Dubai and Minister of Finance**

14-16 January 2014

Dubai, United Arab Emirates

To register please visit the website on the following link: www.biosaline.org

or contact the **conference coordinator Dr Abdullah Al-Dakheel**: a.dakheel@biosaline.org.ae

BIOSALINITY NEWS

WORD FROM ICBA DIRECTOR GENERAL



ICBA witnessed a sustained growth over the past six months. It has continued reinforcing its team members and focusing on attracting new blood to ICBA, namely Postdoctoral fellows.

The Center also extended its reach to new marginal environments and new partners. In March 2013, ICBA Board of Directors approved the new strategy for 2013-2023. This Strategy charts the path forward for ICBA for the next decade. Innovation and excellence is at the core of the new ICBA strategy and is embedded in every aspect of ICBA's work whether at research level or administrative and management levels. With the help of our partners we will innovate, build human capital and encourage the learning that is fundamental for change.

As 2013 is the 'Year of Quinoa', I would like to take this opportunity to highlight the pioneering role of ICBA in the region in conducting research on quinoa. Based on our research on quinoa in several countries in the MENA region, including GCC and Yemen, quinoa is a very promising crop for the region particularly in its marginal environments. During 2013-14, ICBA is expanding its research program on quinoa in collaboration with the UAE Ministry of Environment and Water and the Government of Peru.

ICBA's partnership roundtable in Dushanbe (Tajikistan) with key partners from the Central Asia and Caucasus (CAC) region was an eye opener and shed light on several urgent needs and opportunities. ICBA in partnership with international research centers and donors have a great role to play to improve food security and combat salinity in the CAC region. In parallel, ICBA organized a 'Forum on Innovations in Agriculture and Food Security' in partnership with the Islamic Development Bank (IDB) during IDB's 38th Annual Meeting. This event focused on recent innovations in policy and technology to tackle issues affecting food security in the global perspective.

I will let you enjoy reading the rest of Biosalinity News.

Sincerely yours,

Ismahane Elouafi

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BIOSALINITY NEWS

RESEARCH UPDATES

Sheikh Mansour bin Zayed Praises the Leading Role of ICBA in Salinity Research

His Highness Sheikh Mansour bin Zayed Al Nahyan, Deputy Prime Minister and Minister of Presidential Affairs, praised the leading role of ICBA in the United Arab Emirates in promoting the use of saline water resources to produce fodder crops and fruit trees such as date palms. The work of ICBA has led to reducing the pressure on the depleting fresh water resources. His Highness Sheikh Mansour received a copy of the book of 'Salt Tolerant Plants in the United Arab Emirates' from Dr Ahmed Al Sharif, Deputy Director General of ICBA.

This came during the visit of His Highness to ICBA's pavilion at the Liwa Date Festival, which took place from 18-25 July 2013. Dr Al Sharif stated that ICBA was keen to participate in the Liwa Date Festival as the event is very important in attracting date farmers from various countries to a competition that highlights the finest Emirati dates. It is a truly regional and international event attracting various stakeholders in the date industry.

ICBA Contributes to the UNESCO book "Free Flow – Reaching Water Security through Cooperation"

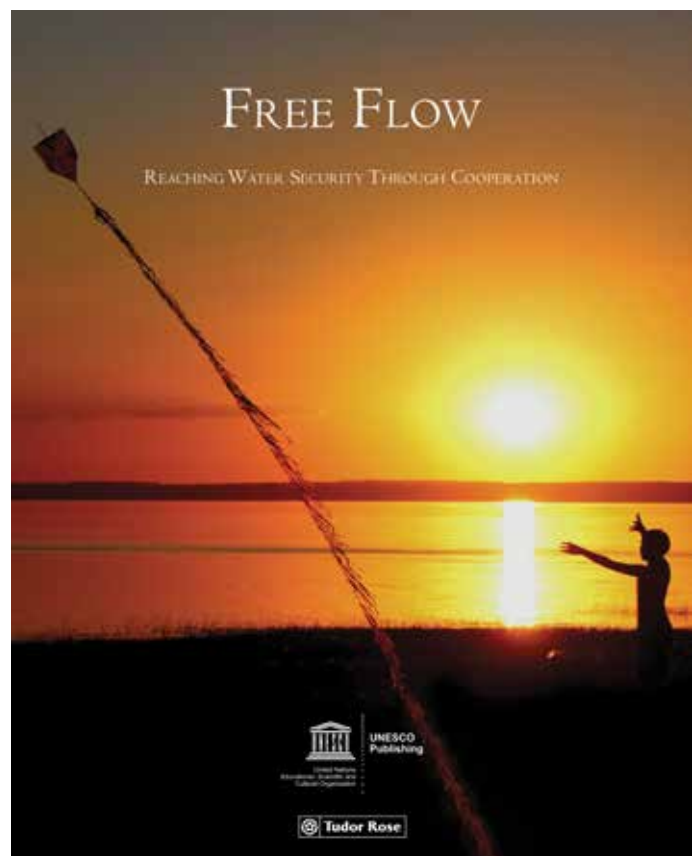
The article 'Alternative water resources in agriculture for improving production and poverty reduction' by Shoaib Ismail, Ian McCann, Shabbir Shahid, Fiona Chandler and Mohamed Amrani from ICBA, has been published as part of the UNESCO book 'Free Flow – Reaching Water Security through Cooperation'. This UNESCO publication was digitally launched at the Stockholm World Water Week 1-6 September 2013 (now live at <http://digital.tudor-rose.co.uk/free-flow>), and the printed version was launched at the Budapest Water Summit on 8-11 October 2013.

By declaring 2013 the 'International Year of Water Cooperation', the United Nations General Assembly recognizes the broad benefits of cooperation in the water domain for achieving the Millennium Development Goals. This UNESCO publication has brought together a broad range of water professionals and stakeholders to share their knowledge and experiences. The chapters in this book reflect the progress and challenges encountered in the fields of water management and cooperation around the world.

ICBA's article includes case studies from the Abu Dhabi Farmer's Service Center project, MAWRED project (the use of modeling and remote sensing for water and agriculture), and ICBA's work in supporting policy (Oman Salinity Strategy). ICBA's contribution to this book makes a compelling case on how to overcome the challenges of using saline and brackish water in agricultural production to develop sustainable and economical production systems in marginal environments.



H.H. Sheikh Mansour bin Zayed with Dr Ahmed Al Sharif at ICBA stand in Liwa Date Festival



Collaboration Leads to Joint Publication of Important Addition to the Technical Literature of Ecology

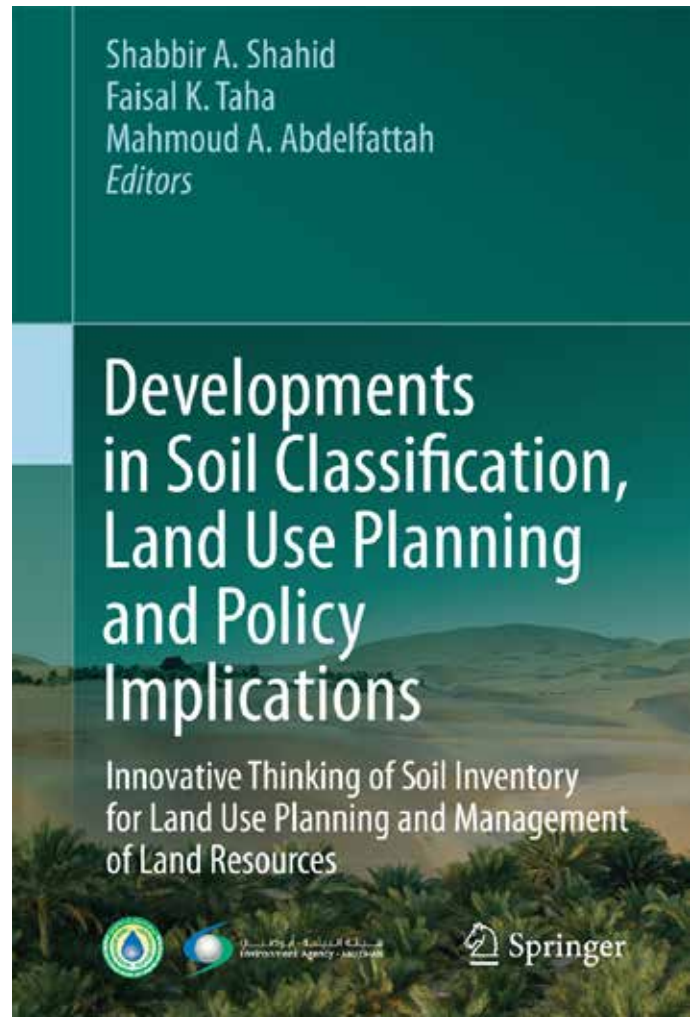
During the Abu Dhabi International Book Fair, ICBA in collaboration with the Environment Agency – Abu Dhabi (EAD) announced the publication of the book titled ‘Developments in Soil Classification, Land Use Planning and Policy Implications.’

This book is the second in a series of three books. The first book was titled ‘Developments in Soil Salinity Assessment and Reclamation’ and was published earlier in the beginning of 2013. The third book under the title of ‘United Arab Emirates Keys to Soil Taxonomy’ is expected to be published by the end of 2013.

Dr Shabbir Shahid (Salinity Management Scientist at ICBA), Dr. Mahmoud Abdelfattah (Soil Scientist at EAD), and Dr Faisal Taha (former Director of Technical Programs at ICBA) are the editors of this book series.

Commenting about these books Dr. Shahid said, “We received an overwhelming response to the call for papers, and over 250 abstracts were received from over 35 countries. The abstracts were reviewed, and those suitable were accepted for the submission of full manuscripts. The diversity of the conference themes made it necessary to publish these papers into two independent books. The papers submitted all went through rigorous technical review and an iterative review process with authors before finalization for publication.” Dr. Shahid thanked EAD, represented by its Secretary General, Her Excellency Razan Khalifa Al-Mubarak and ICBA for their commitment and respective endeavors to ensure the success of the conference and subsequent publication of its proceedings.

The second book ‘Developments in Soil Classification, Land Use Planning and Policy Implications: Innovative Thinking of Soil Inventory for Land Use Planning and Management of Land Resources’ is available in both soft and hard copies. This volume contains chapters pertaining to soil surveys and classification; land use planning and policy implications; new



trends in land degradation and desertification; modeling of soil and groundwater contamination; and innovations in research, development, education, and extension. These are presented in five parts divided into 50 chapters.

For enquiries on how to receive copies of these published books, please contact Nadia Alamodi (n.alamodi@biosaline.org.ae)

New Study on the Reuse of Biosolids in the Emirate of Ajman

ICBA has started a new project to study the reuse of biosolids for agriculture in the Emirate of Ajman. In collaboration with Ajman Sewerage a feasibility study will be done on the reuse of biosolids produced at the Ajman wastewater treatment plant. This study seeks to determine the market for practical reuse of biosolids in Ajman in the near term and the related procedures. It will investigate the status of sewage sludge in Ajman and its capacity to be reused as biosolids. The study will determine the appropriate markets for the use of biosolids and the restrictions relating to quality, quantity, and the need for more laws and legislative policies. In addition, this study will

identify the obligations of producer and users. Implementing the results of the study will be highlighted in a roadmap plan. The study is expected to be completed in the first quarter of 2014.

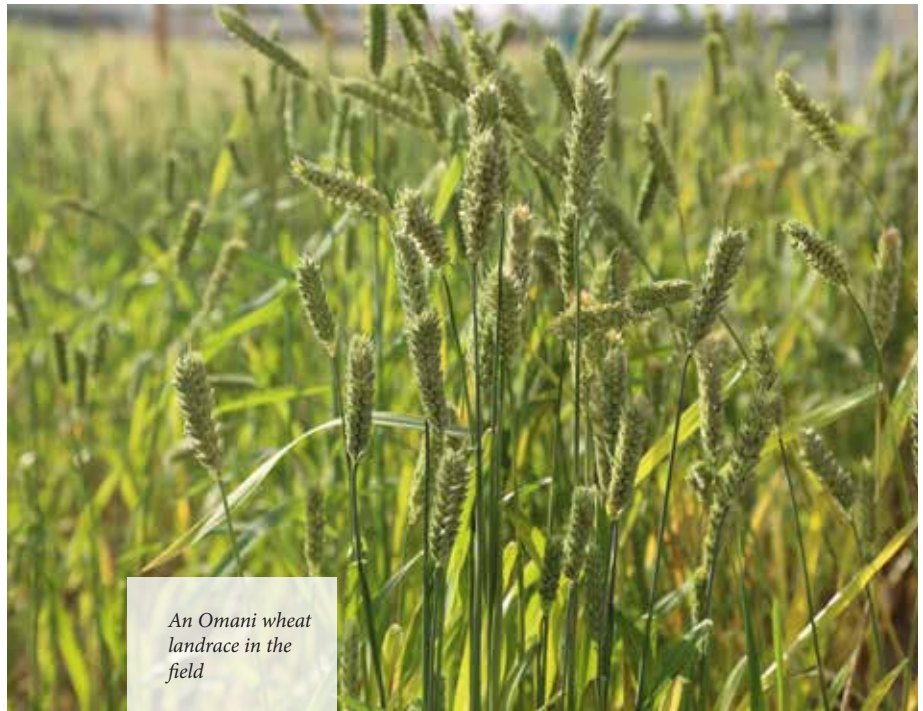
BIOSALINITY NEWS

RESEARCH UPDATES

Diversity in Omani Wheat Landraces

About 10,000 years ago, wheat was domesticated in the Levant Region. It is believed that from that region, 3,000 years ago, wheat was introduced into Oman. Since then, it has been cultivated in various oases of the country resulting in large genetic diversity adapted to the marginal conditions and high temperatures of Oman. It is believed that preserving this genetic diversity directly benefits farmers growing wheat on these marginal lands. To explore further the genetic diversity, ICBA has been identifying the various Omani wheat landraces and comparing traits that are valuable to farmers.

A landrace is a dynamic population of a cultivated plant that has historical origin, distinct identity and has not been subject to formal crop improvement. A landrace is often genetically diverse, locally adapted and associated with traditional farming systems. By their very nature wheat landraces are more genetically diverse than the current high yielding varieties that have a narrow genetic base. This means that they are a valuable source for plant breeders working to develop plant varieties with certain desired characteristics such as salinity tolerance. Landraces, also called traditional varieties, are under severe threat of genetic erosion mainly due to urbanization and to their replacement by new genetically uniform varieties.



In Oman, wheat has never been a major crop. In 2011, about 640 hectares were under wheat cultivation, down from 1,000 hectares in 1961. The ancient low yielding wheat landraces cultivated in Oman has decreased by 75% in a span of 8 years. Now, mostly modern high yielding varieties are planted for wheat production with the ancient landraces grown in far-flung oases of the Sultanate.

Omani wheat landraces (*Triticum* spp.) show a broad spectrum of diversity with at least five species, i.e., *Triticum aestivum*, *T. aethiopicum*, *T. compactum*, *T. dicoccon* and *T. durum*. Two of these species (*T. aestivum* and *T. compactum*) are hexaploids meaning they have six

sets of chromosomes, while the other three species are tetraploids (four sets of chromosomes). The diversity in Omani wheat landraces is due to its geographic location as well as its ancient trade relationships with the Far East, South Asia, East Africa and the Middle East. In Oman, usually both tetraploid and hexaploid landraces are cultivated together. When different kinds of wheat genotypes are grown together in the same field, it may lead to hybrid swarms; another reason for the genetic diversification of Omani wheat.

Due to the genetic value of Omani wheat landraces, ICBA started research to identify available Omani wheat landraces, compare their traits, and preserve part of it. A bulk sample of wheat seed was obtained from a farmers' market in Oman and then planted to identify components of the landrace, and to select maximum diversity within the seed sample for a follow-up study. Different agronomic characteristics (Table 1) were studied to determine the diversity among the wheat landraces. The research identified five landrace populations. These landraces, which are similar to other landraces in the primary and secondary centers of wheat diversity, can provide a largely unexplored diversity with great potential for broadening the genetic base of modern wheat cultivars (Table 1).



Table 1: Trait least square means

	Landrace 1	Landrace 2	Landrace 3	Landrace 4	Landrace 5
Plant height, cm	66.98	69.43	86.79	91.35	101.45
Spike length, cm	10.24	11.92	9.62	9.46	13.43
Awn length, cm	3.42	4.69	2.44	2.24	6.15
Spikelets/spike	16.83	17.54	22.51	20.74	23.98
Seeds/spike	33.82	46.97	67.54	47.83	81.22
Spike density	3.72	4.48	8.215	5.84	7.40
Seed length, mm	6.51	6.16	6.31	6.33	3.27
Seed width, mm	2.80	2.95	2.97	2.90	2.98
Seed size, mm ³	2.36	2.11	2.16	2.22	2.15
100-seed wt, mg	3.22	3.28	3.20	3.34	3.45
Days to heading	100.06	82.33	92.13	93.34	89.83
Days to maturity	133.60	125.80	128.53	128.98	126.22
Filling period, days	33.57	43.51	36.39	35.62	36.39
Spike/Plant length	0.16	0.17	0.11	0.10	0.13
Awn/Spike length	0.27	0.35	0.17	0.16	0.35
Spikelet fertility	2.03	2.72	3.04	2.34	3.40

Local landraces may provide new alleles (DNA codings that determine distinct traits that can be passed on from parents to offspring) for the improvement of commercially valuable traits in wheat, including quality traits and adaptation to biotic stresses (stress caused by living organisms such as insect pests and diseases) and abiotic stresses (stress caused by salinity, heat, water scarcity, etc.). In ICBA's study, it was found that landrace populations are characterized by large diversity at different hierarchical levels (Jaradat & Shahid 2013). It was



Diversity in seeds and spikes of Omani wheat landraces

concluded that the five landrace populations identified, similar to other landraces in the primary and secondary centers of wheat diversity, can provide a largely unexplored diversity with great potential for broadening the genetic base of modern wheat cultivars. However, landraces may have some undesirable traits, such as susceptibility to lodging and low average yields. Nevertheless, they are retained because they are a low risk option under marginal conditions, resulting in fewer poor production years.

In conclusion, the landrace populations identified in the study are highly diverse and constitute valuable sources of traits for adaptation to marginal wheat-growing parts of the world with high temperature and salinity, and may have gene complexes to combat climate change. However, the utilization of this genetic diversity needs systematic evaluation of many traits, especially those of quality significance and those that confer adaptation to climate change.

By Mohammad Shahid, Plant Genetic Resources Program, International Center for Biosaline Agriculture (ICBA), Dubai, UAE

N.K. Rao, Plant Genetic Resources Program, International Center for Biosaline Agriculture (ICBA), Dubai, UAE

Abdullah Jaradat, USDA-ARS and Department of Agronomy and Plant Genetics, University of Minnesota, 803 Iowa Ave., Morris, MN 56267, USA

Reference:

Jaradat & Shahid 2013. EJFA 26:16753 (in press)

BIOSALINITY NEWS

RESEARCH UPDATES

Quinoa Research and Development at ICBA

In recent years, quinoa (*Chenopodium quinoa* Willd.) has been receiving worldwide attention as a multi-purpose agro-industrial crop that can thrive in extreme soil and climatic conditions. Quinoa is a facultative halophyte with the most tolerant varieties being able to cope with salinity levels as high as those of seawater. It can grow successfully in poor soils, including pure sand and in environments with annual rainfall as little as 200 mm. Quinoa is one of the most nutritious food crops currently known. The seed contains high quality protein, rich in the essential amino acids lysine, methionine and threonine that are scarce in cereals and legumes. In view of its exceptional nutritional quality and ability to grow under marginal environments, the Food and Agriculture Organization of the United Nations (FAO) has recently identified quinoa as one of the crops that will play an important role in ensuring future food security and designated the year 2013 as the 'Year of Quinoa'. Worldwide, the demand for quinoa is growing, especially in the health food segment, but current supplies are unable to match it. Besides the use for human consumption, quinoa seed has other uses as livestock and poultry feed. The whole plant is used as green fodder and harvest residues are fed to animals.

ICBA has been studying quinoa since 2005 as an alternative crop for salt affected areas in the Arabian Peninsula with highly promising results, in spite of its distant origin in the highlands of the Andes. For instance, in field trials with low-salinity water at ICBA research station, yields of up to 4 t/ha have been obtained which were comparable with the yields reported from the traditional growing areas in South America. Considering that research at the International Potato Center (CIP) in Peru showed that salt tolerance of quinoa is very high in being able to grow and produce in salt concentrations close to seawater, ICBA as part of the collaborative project with Abu Dhabi Farmers' Service Center, has recently

studied the performance of some selected cultivars in the model farms in the western region of Abu Dhabi, where the salinity of irrigation water was in the range of 13-18 dS m⁻¹. The data on biomass and seed yield obtained from these trials indeed corroborated the findings that quinoa holds promise as a multipurpose crop for salt-affected areas. ICBA is also evaluating the performance of quinoa in Yemen and six other countries, as part of the collaborative project 'Adaptation to climate change in West Asia and North Africa marginal environments through sustainable crop and livestock diversification' supported by the International Fund for Agricultural Development (IFAD), OPEC Fund for International Development (OFID), and other donors. Preliminary results appear to be very encouraging.

As with any other new crop, one of the key factors for successful introduction and establishment of quinoa under the novel climates will be the identification of appropriate planting material. So far, quinoa cultivation is largely limited to the Andean region and not much information is available on the environmental and the genetic influence

on productivity especially under arid climatic conditions. It is therefore important to study the adaptation and yield potential of several genotypes from different provenances to select the most promising genotypes suitable for the local agro-climatic conditions.

Information on these aspects as well as economic assessment of the profitability of cultivating quinoa is essential, especially when cultivated under the prevailing sub-optimal conditions in the partner countries.

ICBA will continue its research—especially with the focus on evaluating the productivity on a range of soils using different qualities of irrigation water and identifying high yielding salt and heat tolerant quinoa lines/varieties suitable for marginal areas—in collaboration with the Ministry of Environment and Water in the United Arab Emirates, and the Instituto Nacional de Innovación Agraria (INIA) and Universidad Nacional Agraria La Molina (UNALM) in Peru, who have expressed interest in expanding the production of quinoa for exploitation of marginal lands.

By NK Rao, Plant Genetic Resources Scientist, ICBA, Dubai, UAE



Quinoa plant in the ICBA research field in Dubai

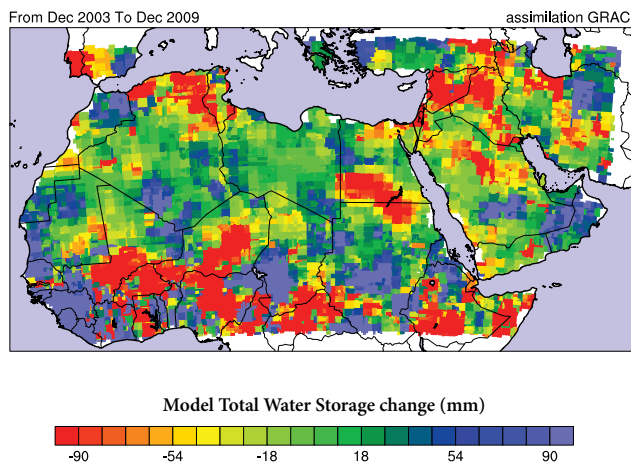
Modeling and Monitoring Agriculture and Water Resources Development (MAWRED)

The Middle East and North African (MENA) region is characterized by a strong hydro climatic and inter-annual variability. With 90% of the water in the MENA region used for agriculture, the declining groundwater levels increase the need for analysis tools that can be used to evaluate water resource status and trends in the water balance at the regional scale. In the USAID funded and ICBA led project 'MAWRED' the goal is to provide an integrated comprehensive hydrological modeling framework by combining remote sensing and advanced modeling tools in order to generate physically consistent estimates of hydrologic storage variations and surface fluxes at a regional scale.

In its fourth year, the project has been exploring the Catchment Land Surface Model (CLSM), which is a computational model that describes the essential characteristics of the important interactions between the soil, the biosphere and the atmosphere and is one of the few modern Land Surface Models that simulates the unconfined groundwater variations. The model uses near surface meteorological data (rainfall, downward radiation, snowfall, temperature, humidity, wind magnitude and surface pressure) and uses physical equations to determine the evolution of water and energy states (e.g. surface and rooting zone soil moisture and temperature) and fluxes (e.g. actual evapotranspiration and sensible heat flux). The project has installed operational programs to download every 6 hours an updated reanalysis of atmospheric data from The U.S. National Centers for Environmental Prediction (NCEP) called the Global Data Analysis System GDAS. The resolution of such data is about 25 km.

The remote sensing data provided by GRACE satellite enables reliable detection of variations in total terrestrial water storage (TWS—the sum of groundwater, soil moisture, snow,

Figure 1: MENA LDAS-Catchment Land Surface Model (with data assimilation)



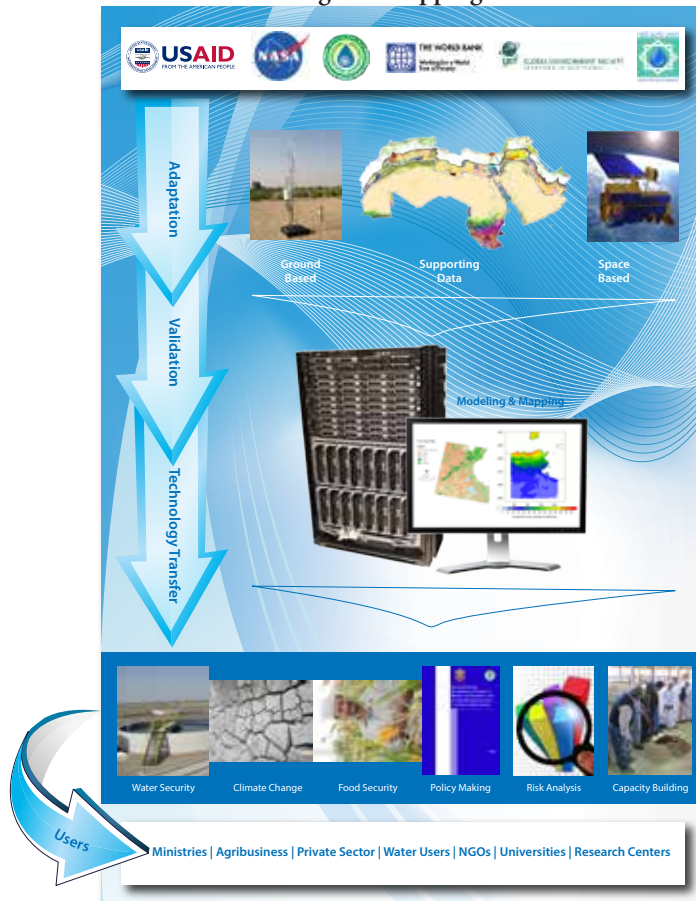
surface water, ice and biomass). GRACE is a unique satellite that can detect groundwater and surface water variations for the entire globe without being affected by the atmosphere. Its observations of the terrestrial gravity are linked to the change in Terrestrial Water Storage in unconfined aquifers. Nevertheless, GRACE observations, have very low spatio-temporal resolution (250 km

x250 km and available once per month) so to realize the full potential of GRACE, the derived TWS needs to be disaggregated horizontally, vertically and in time. The most sophisticated approach is to use data assimilation techniques (here EnKS—Ensemble Kalman Smoother algorithm). The project was able to merge GRACE-derived TWS with that simulated by

CLSM which has generated physically-based and temporally continuous estimates of hydrologic storage and fluxes that are informed by the spatially coarse but information rich GRACE observations of TWS (see Figure 1.)

By Karim Bergaoui, Land Surface Modeling Scientist, ICBA, Dubai, UAE

Innovative Modeling and Mapping



BIOSALINITY NEWS

PARTNERSHIPS

ICBA Round Table Meeting with Central Asia Partners

ICBA places a high value on working in partnerships. To this end, in conjunction with the Islamic Development Bank's 38th Annual Meeting in Dushanbe, the Center organized a meeting with current and potential partners from the Central Asian region. Dr Ismahane Elouafi, Director General of ICBA, chaired the meeting, where each participant presented their institution, highlighted the current problems, and identified potential projects for cooperation and collaboration over the short and medium term.

(Uzbekistan), and from the Uzbek Karakul Sheep Breeding and Desert Ecology Institute (Uzbekistan).

In addition, present from Russia was the representative of the Eurasian Center for Food Security of Lomonosov, Moscow State University. Representatives of regional organizations and the Islamic Development Bank also participated.

Following the discussion, it was clear that many issues were common in the Central Asia region such as dependence on irrigation, salinity, low soil fertility, water scarcity and contamination, groundwater, decreasing land productivity, the importance of technical capacity development, up-to-date curricula for advanced education, and results realized, but not disseminated practically into

ICBA Signs Collaborative Research Agreement with King Abdullah University of Science and Technology

ICBA and King Abdullah University of Science and Technology (KAUST) signed a collaborative research agreement on 18 July 2013, that will support ICBA conducting research on the quantification of salinity tolerance of cereals in field conditions. This project will extend over a period of 36 months and will take place between Thuwal and Dubai. KAUST will be transferring plant seed (wheat and barley) to ICBA for growing in low and high salinity conditions in the field.

ICBA signs cooperation agreement with ICCTLA

On 27 July 2013, Dr Ismahane Elouafi, DG of ICBA, and Dr Daniel Abugattas Majluf, President of Instituto de Investigacion y Cooperacion Cientifica y Tecnologica Arabe-Latino Americano y del Caribe (ICCTLA), signed a cooperation agreement between their respective organizations. This agreement is to establish reciprocal cooperation between ICCTLA and ICBA for research, especially for realization of joint research for the development of underutilized species such as the Andean grains, with high nutritional value and high tolerance to salinity, and capacity building activities in the development of agriculture, food security and nutritional security in marginal environments.



From left to right: Mr Demba Ba (Director, Agriculture and Rural Development, IDB), Dr Ismahane Elouafi (Director General of ICBA), Dr Hukmatullo Akhmadov (President, Tajik Academy of Agricultural Sciences), Mr Fawzi AlSultan (Chairman of ICBA)

The round table meeting included representatives from the Institute of Botany of the Academy of Sciences (Azerbaijan), Scientific Center on Biotechnology (Kazakhstan), Institute of Plant Husbandry (Kazakhstan), KazAgro Innovation (Kazakhstan), National Academy of Sciences (Kyrgyzstan), Innovation Centre of Phytotechnologies (Kyrgyzstan), Institute of Soil Research (Tajikistan), Tajik Academy of Agricultural Sciences (Tajikistan), Institute of Flora & Fauna from the Ministry of Nature Protection (Turkmenistan), Scientific Centre for Agriculture of the Ministry of Agriculture and Water Economy

development initiatives. Participants noted a number of promising solutions and innovations such as biotechnology, availability of data, mechanization, and other technologies like greenhouses, appropriate crops, and management. It was also acknowledged that policy and legislation play a critically important role in supporting appropriate management and research to support these innovations.

Forum on Innovations in Agriculture and Food Security Highlighted at Islamic Development Bank Annual Meeting



Over 200 participants in the Forum on Innovations in Agriculture and Food Security in Dushanbe, Tajikistan, on 20 May 2013

On 20 May 2013, during the 38th Annual Meeting of the Islamic Development Bank (IDB), ICBA and IDB co-organized a forum to present and discuss policy and technological innovations in agriculture and food security. This cooperation reflects more than a decade of strong partnership between ICBA and IDB.

The Forum was designed to highlight a selection of recent innovations in policy and technology to tackle issues affecting food security. With a wide selection of panelists from the private and public sector, from local, regional and global perspectives, the Forum attracted an audience of over 200 people.

Two panel sessions were held one focusing on innovations in policy and the other on technical innovations. Keynote speakers included H.E. Murodali Alimardon, Deputy Prime Minister of Tajikistan and Mr Fawzi Al Sultan, Chairman of ICBA Board of Directors.

Noted experts from the policy perspective included Jeffrey Sachs, Director of The Earth Institute at Colombia University; H.E. Dr. Kosimov Kosim, Minister of Agriculture of Tajikistan; Dr Sergey Kiselev, Director General of Eurasian Center for Food Security in Moscow; Demba Ba, Director of Agricultural and Rural Development in IDB; and Dr Ismahane Elouafi, Director General of ICBA. The

panel agreed on the need for sustained global recognition and action on food security issues through the UN, G8 and G20 deliberations, that changes in behavior will be necessary and that policy and institutions (both public and private) have a role to play.

The second panel tackled technical solutions now being designed and implemented. Mr Hans Hassle, the CEO of Plantagon, a company specializing in urban agriculture, said that to grow large amounts of food in urban environments we will need to go vertical, a technology his company specializes in. Chang Hoo Chun, Senior Advisor at Gyeonggi

Agricultural Research and Extension Services spoke about his organization's success in precision agriculture. Innovation in seed production and equipment and adapting these to local environments was explained by Mr Stephen Hill, Managing Director of Kimseed International. Dr Shoab Ismail, Acting Director of Research and Innovations at ICBA, provided an explanation on innovations in optimizing resources. Other innovations from a regional and local level were provided by Dr Hukmatullo Akhmadov, President of Tajik Academy of Agricultural Sciences.



From left to right: Dr Ismahane Elouafi (Director General of ICBA), Jeffrey Sachs (Director of The Earth Institute at Colombia University), H.E. Dr Kosimov Kosim (Minister of Agriculture of Tajikistan), H.E. Murodali Alimardon (Deputy Prime Minister of Tajikistan), H.E. Birama Boubacar Sidibe (Vice President of Operations, IDB), Mr Demba Ba (Director, Agriculture and Rural Development, IDB), and Dr Sergey Kiselev (Director General of Eurasian Center for Food Security in Moscow)

BIOSALINITY NEWS

EVENTS & TRAINING

Conference on “The Use of Treated Wastewater in the Agricultural Production in the Arab World: Current Status and Future Prospective”, 14-16 January 2014

Treated wastewater (TWW), if used safely, is a valuable resource for water-scarce areas such as the Arab region. The use of TWW by farmers can contribute to enhancing their productivity and income. Over the past five years, ICBA in collaboration with the Arab Center for the Study of Arid Zones and Dry Lands (ACSAD), the Islamic Development Bank (IDB) and other donors, have conducted research studies, capacity building programs, experts' meetings and workshops in the Arab region exploring the opportunities and constraints of using TWW in agriculture.

The UAE Ministry of Environment and Water (MOEW), ICBA and ACSAD are organizing a conference on “The Use of Treated Wastewater in the Agricultural Production in the Arab World: Current Status and Future Prospective” on 14-16 January 2014 in Dubai, UAE. The conference's program will include updates on data, information and knowledge in regards to the use of TWW from regional and international experiences.

The objectives of the conference are to:

1. Review the current status of the use of TWW in agriculture in the world with an emphasis on the Arab world, including best management practices, guidelines, regulations, policies and strategies;
2. Explore the future potential of TWW in agriculture in the Arab world, and
3. Explore policy support in the region for the use of TWW in agriculture.

For more information on the conference, contact the conference coordinator:

Dr Abdullah Al-Dakheel:
a.dakheel@biosaline.org.ae



The Role of Marginal Water on Food Security

During the Stockholm World Water Week, ICBA in partnership with the International Water Management Institute and the United Nations Environment Programme-Regional Office for West Asia hosted a panel discussion on the subject of ‘The Role of Marginal Waters on Food Security’.

The panel and discussions highlighted that public acceptance has become an essential component for successful marginal water use projects and these projects should be approached not as an engineering project, but as a public acceptance project.

In terms of policies and regulations on the use and management of marginal

waters, the session noted that governance structures for treated wastewater tend to be complex and fragmented in most countries as it involves controls on effluents into the sewerage network, the treatment system as well as in subsequent use.

Countries that are best positioned to benefit from marginal waters are those experiencing varying degrees of scarcity. The session concluded that the benefits of using marginal waters—economic, energy and social—need to be emphasized in the planning of their increased use. Once these are understood and accepted the possibilities of policies backed up with the necessary legal and regulatory frameworks are much easier to introduce and pass.

Farm in Every House

ICBA, in partnership with the Supreme Council for Family Affairs in Sharjah, led a workshop (25-29 August 2013) for over 500 families interested in cultivating their own small home gardens. The workshop provided participants with information on new agricultural techniques in organic farming and irrigation using marginal water resources such as saline and brackish water. The workshop also introduced several types of salt tolerant plants and best planting practices. This model initiative has had many positive impacts including exposing participants to how they can enhance their nutritional needs through access to fresh, locally grown organic vegetables. In addition, the ‘Farm in Every House’ project increased the greenery levels within urban homes and the awareness about the various environmental impacts of agricultural practices. It is



UAE farmer inspecting the crops in the farm

hoped that projects such as this will instill a greater understanding of nutrition, agriculture, and the environment.

Project Meeting and Workshop on Irrigation in Sub-Saharan Africa

ICBA hosted the six month progress meeting of the project: 'Integrated Crop and Seed Production Systems under Water/Irrigation Management in Sub-Saharan Africa' from 8-12 September. Inaugurated by Dr Ismahane Elouafi, Director General of ICBA, the project is being implemented in Burkina Faso, the Gambia, Mali, Mauritania, Niger, Nigeria and Senegal. All countries with the exception of Mali participated in the meeting, during which the progress of project activities were reviewed against the agreed work plans. The group also spent time developing concepts and ideas for formulating new project proposal initiatives with an aim to expand project activities.

Traveling Workshop in Yemen

ICBA in collaboration with the Agricultural Research and Extension Authority (AREA) of Yemen organized a traveling training workshop on 'Variety selection, seed production, soil and crop management practices and on-farm efficient forage utilization' (15-18 September 2013). The workshop was part of the 2013 activities of the regional project on 'Adaptation to climate change in WANA marginal environments through sustainable crop and livestock diversification', funded by the International Fund for Agricultural Development (IFAD), the Arab Fund for Economic and Social Development (AFESD), the OPEC Fund for International Development (OFID) and the Islamic Development Bank (IDB). The objectives of the workshop were to:

1. Involve farmers and extension staff in participatory evaluation of trials and identification of productive cultivars, appropriate crop management practices and production constraints;



Front row, right to left: Dr Madima Cisse (ISRA, Senegal), Mr Ansumana Gibba (NARI, The Gambia), Dr Ahmed Al Sharif (ICBA, UAE), Eng Cheikh Ahmed Moctar (CNRADA, Mauritania), Mr Salou Moussa (INRAN, Niger), Mr Matthew Gomez (NARI, The Gambia), Dr Nurul Akhand (ICBA, UAE), Mr Elhousseine Ould Mabrouk (CNRADA, Mauritania)

Back row, right to left: Mr Tradore Adama (INERA, Burkina Faso), Eng Jamal Ghazi Telmesani (ICBA, UAE), Dr Mamadou Sall (ISRA, Senegal), Eng. Adamu Ibrahim Arab (NAERLS, Nigeria), Dr Ian McCann (ICBA, UAE), Eng Saidou Amadou Moussa (INRAN, Niger), Mr Aliyu Ammani (NAERLS, Nigeria), Dr Makram Belhaj Fraj (ICBA, UAE)

2. Identify best practices in seed production and crop management to be adopted by farmers;
3. Exchange knowledge and enhance the skills of national staff and farmers in all aspects of forage production and utilization in marginal environments, and
4. Develop the capacity of farmers and technical staff in the techniques for on-farm forage processing and utilization, and value addition to the farm products.

This traveling workshop witnessed great interaction between the farmers, the national agricultural research system, and the representatives of ICBA in Yemen. ICBA's efforts were highly appreciated by senior officials of the Yemeni government, where the Minister of Agriculture expressed the importance of transforming the current ICBA project to a large-scale implementation for the seed production of salt tolerant forages. As a result, discussions are ongoing on the second phase of this project.

Training on Irrigation Scheduling and Water Consumption

Between 15 and 17 September 2013, ICBA conducted specialized training on "Irrigation scheduling and water consumption". Organized in collaboration with the UAE Ministry of Environment and Water (MOEW), the course was attended by 10 experts and technicians from the MOEW.

The course focused on providing participants with theoretical and practical knowledge related to integrated water resources management in the UAE, crop water requirements, irrigation scheduling and management and innovative irrigation systems design.

Participants concluded that the course had been useful especially in raising their awareness on the necessity of identifying plants' individual water requirements and best practices in irrigation, both of which are critical factors in preserving and maximizing agricultural productivity in the scarce water of the UAE.

BIOSALINITY NEWS

@ICBA

ICBA Launches New Strategy

The ICBA Board of Directors met on 26 and 27 March 2013 at ICBA Headquarters in Dubai. The meeting, chaired by the ICBA Board Chair, Mr Fawzi AlSultan, saw discussion on a number of important topics relevant to the Center's governance. A signature event at the meeting was the Board's approval of the new ICBA Strategy 2013-2023.

"The scientists, staff and I are all looking forward to the next stage in ICBA's evolution with this new Strategy to guide our efforts," said Dr Ismahane Elouafi, Director General of ICBA. Over the coming months the new ICBA Strategy will be shared widely with partners and stakeholders and the Center will develop its four-year business plan to operationalize the Strategy. The resulting ICBA Strategy 2013-2023 is a major step forward for the Center that takes innovation as a core principle. As outlined in the Strategy, applied research will be directed to innovative solutions to food and water security in marginal environments; applying new



technologies including biotechnology; developing multiple uses for wastewater and seawater; becoming a pioneering knowledge hub; and extending and deepening the Center's partnerships.

To download the ICBA Strategy visit: www.biosaline.org/publications.aspx

The strategy is also available in hard copy upon request by contacting Nadia Alamodi (n.alamodi@biosaline.org.ae)

ICBA Congratulates Dr Henda Mahmoudi on her Election as a Member of AGYA

ICBA congratulates Dr Henda Mahmoudi, biotechnologist at ICBA, on her election as a one of the first members of the Arab-German Young Academy of Sciences and Humanities (AGYA). AGYA had received more than 250 applications from 20 countries in a highly competitive process. The advisory board of AGYA, consisting of Presidents from some of the most renowned Arab and German research institutions, selected Dr Mahmoudi to be one of the first 20 members of the AGYA.

AGYA is a project of the German Die Junge Akademie and the Arab World Academy of Young Scientists in cooperation with the Berlin-Brandenburg Academy of Sciences and Humanities and the German National Academy of Sciences Leopoldina. The main objective of AGYA is to advance the academic exchange of young researchers from Germany and the Arab countries.

ICBA WELCOMES ITS NEWEST STAFF MEMBERS:



Mr Thamer Abdulla Ahmed
Executive Assistant - DDG Office



Ms Lina Muneer Abubaker
Receptionist



Mr Khalil Mohamed Abdulla
Human Resources Officer



Mr Rashyd Zaaboul
Climate Modeling Scientist



Ms Suzan Nooraddin
Administrative Assistant



Dr Shagufta Gill
Post Doctoral Fellow
Municipal solid waste,
importance, and usage in UAE



Dr Dionysia Angeliki Lyra
Post Doctoral Fellow
Agronomy & management of
halophytic/salt-tolerant crops



Dr Natalya G. Akinshina
Post Doctoral Fellow (CAC)
Crop diversification in salt
affected lands



Dr Muhammad I. Hussain
Post Doctoral Fellow
Salinity tolerance of field and
forage crops



Ms Celine Papin
Research Project Officer

Celebrating World Environment Day

World Environment Day, initiated by UNEP in 1972, is an annual event celebrated worldwide on 5 June, and is the biggest and most widely celebrated global day for positive environmental action. To mark the celebration of World Environment Day, ICBA launched a campaign to replace the potentially hazardous damas trees (*Conocarpus lancifolius*) at the Center with more appropriate species.

BIOSALINITY NEWS

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ABOUT ICBA

ICBA's work addresses the closely linked challenges of water, environment, income, and food security. The Center's applied research for development aims to address the agricultural challenges in marginal environments including assessment of natural resources, climate change adaptation, crop productivity and diversification, aquaculture and bio-energy and policy analysis. ICBA is working on a number of technology developments including the use of conventional and non-conventional water (such as saline, treated wastewater, industrial water, agricultural drainage, and seawater); water and land management technologies and remote sensing and modeling for climate change adaptation. Building capacity and sharing knowledge is an important part of all ICBA does. ICBA's work reaches countries, including least developed countries, in Central Asia and the Caucasus, the Middle East and North Africa (MENA), South and South East Asia, sub Saharan Africa and Gulf Cooperation Council countries.

ICBA's new strategy 2013-2023 takes innovation as a core principle. Applied research will be directed to innovative solutions to food, nutrient, and water security in marginal environments, applying new technologies including biotechnology, developing multiple uses for wastewater and seawater, becoming a pioneering knowledge hub, and extending its partnerships. With the help of its partners ICBA will innovate, build human capital, and encourage the learning that is fundamental for change.

