



## ICBA and IDB-member countries

Partners in fostering innovative solutions that promote sustainable agriculture and rural development

## ICBA and IDB-member countries:

Partners in fostering innovative solutions that promote sustainable agriculture and rural development.

Many of the 56 Islamic Development Bank (IDB) countries, concentrated in North and East Africa, the Middle East, and central and South Asia, are in some of the most water-scarce areas on earth. Renewable water resources are nearly fully exploited, and non-renewable water resources, e.g., ancient groundwater aquifers, are being rapidly depleted. The rural poor suffer the most from water scarcity, because they lack political or economic influence, or the financial resources to buy water services. When water supply, sanitation or irrigation services fail to reach them, their livelihoods and health are seriously compromised.

Originally established in 1999 as a research and development institute focusing on the problems of salinity and using saline water for irrigated agriculture, the International Center for Biosaline Agriculture – ICBA has evolved over the last 15 years into world class modern research facility with a team of international scientists to conduct research on improving the well-being of poor farmers cultivating under marginal conditions. Strategically the Center has broadened its initial focus on applied research and technology development in saline irrigated agriculture to a broader and more integrated approach to strengthening the agricultural sector and identifying sustainable solutions for food and water security in marginal environments.

To ensure food security by 2050 the agricultural sector must produce enough food for a population of 9.1 billion, while providing employment and environmental services, and adapting to climate change. ICBA

believes that marginal environments provide opportunities to enhance food and water security and sustainable livelihoods. The research programs at ICBA are working at the regional, national, state/local and farmer levels to improve agricultural productivity and sustainability. This multi-pronged approach to strengthening the agricultural sector to expand food production by facilitating access to technology, improved germplasm, policies, strategies and programs, is critical to achieve greater food security. Empowering small-scale farmers to expand sustainable, more-intensive crop production (by increasing the resilience of their production systems to respond to increasing demands for limited water resources) for growing forage, food and bioenergy crops will enhance food security.

With the rapid rate at which land and water resources are being degraded and the impacts of climate change and other abiotic stresses on agricultural production, future research has to be directed towards applied and result-based outcomes. Research has to be clearly linked with potential for scaling-up and scaling-out so that the research can be transformed into success stories and eventually into developmental projects.

Significant support from the IDB, the government of the United Arab Emirates, donors and fellow researchers, and partners in national programs has encouraged the evolution in ICBA's research agenda. This brochure summarizes ICBA's historical and current interactions with all 56 IDB-member countries on research projects and capacity building and illustrates how ICBA is working with partners to improve the livelihoods of the rural poor. In addition to research projects and capacity development, the free newsletter Biosalinity News contributes to information sharing and knowledge exchange. Readers of Biosalinity News are widespread in member countries.



Working in partnership to deliver agricultural and water scarcity solutions in marginal environments

“The quest for food security can be the common thread that links the different challenges we face and helps build a sustainable future.”

*José Graziano da Silva, United Nations Food and Agriculture Organization (FAO)  
Director-General*

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# COUNTRY PROFILES

## AFGHANISTAN

Capacity Building

2003

- In-situ conservation of plant genetic resources
- Sustainable irrigated agricultural production on degraded/saline land

## ALBANIA

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## ALGERIA

Capacity Building

2003

- Quality evaluation and utilization of salt-tolerant forages
- Salinization of irrigated lands and reclamation

2005

- Integrated Management of Saline Water Resources and Environments for Forage Production in North Africa Region

2006

- Scientific Training on Biosaline Agriculture
- AOAD Course on the Utilization of Saline Water in Agriculture

2009

- Biosaline Agriculture Technologies in the Arid and Semi-arid Regions

2011

- Techniques for the use of treated wastewater in agricultural production and its role in food security in the Arab world

## ANGOLA

Capacity Building

2007

- Biosaline Agriculture Technologies for Arid and Semi-arid Regions with Reference to Africa (BADEA course)



## AZERBAIJAN

Capacity Building

2002

- Production and management of salt-tolerant and halophyte forages and tree species
- Agro-ecological surveys and germplasm collection

2003

- Quality evaluation and utilization of salt-tolerant forages
- Salinization of irrigated lands and reclamation

2003

- Biosaline agriculture and sustainable production systems

2004

- Biosaline Agriculture Principles & Applications with reference to Central Asia & the Caucasus Region

2006

- Advances in Biosaline Agriculture with Reference to Central Asia and Caucasus Region

## BAHRAIN

Capacity Building

2006

- AOAD training on “Train the trainers on water awareness in the Arabian Peninsula” Biosaline Agriculture Workshop
- AOAD Course on the Utilization of Saline Water in Agriculture

2008

- Regional training workshop on Biosaline Agriculture Technologies for the Arab Region

2009

- Biosaline Agriculture Technologies in the Arid and Semi-arid Regions

2011

- Techniques for the use of treated wastewater in agricultural production and its role in food security in the Arab world

## BANGLADESH

MOU

- Bangladesh Agricultural Research Institute (BARI), 2002

Capacity Building

2002

- Design and management of irrigation systems for biosaline agriculture
- Production and management of salt tolerant and halophyte forages and tree species
- Agro-ecological surveys and germplasm collection

2003

- Salinization of irrigated lands and reclamation

Research:

**Title:** Demonstration of biosaline agriculture in salt-affected areas in Bangladesh

**Duration:** 2003-2007

**Collaborators:** BARI

**Funding:** ICBA core, BARI

**Title:** Development of technologies to harness the productivity potential of salt-affected areas of the Indo-Gangetic, Mekong, and Nile river basins

**Duration:** 2004-2007

**Collaborators:** RRI; BARI, Bangladesh; Rice Research and Training Center, Egypt; Rice Research Institute of Iran

**Funding:** CGIAR Challenge Program on Food and Water through IIRI

**Title:** Biosaline Agroforestry: Remediation of saline wastelands through production of renewable energy, biomaterials and fodder

**Duration:** 2007-2010

**Collaborators:** ICBA, OASE (Netherlands); Utrecht University (Netherlands); BARI (Bangladesh); CSSRI (India); PARC (Pakistan); ACACIA (Netherlands); CITA (Netherlands); Universität Hohenheim (Netherlands)

**Funding:** European Union

**Title:** Marginal water resources assessment and use for growing horticultural crops and fodders in the coastal saline areas of Bangladesh

**Duration:** 2007-2009

**Collaborator:** BARI

**Funding:** ICBA core and BARI

**Title:** Regeneration and dissemination of salt-tolerant germplasm

**Duration:** 2007-2013

**Collaborators:** National and international plant genetic resources programs

**Funding:** ICBA core

## **BENIN**

Capacity Building

**2010**

- Biosaline agriculture technologies for arid and semi-arid regions with reference to Africa (BADEA)

**2013**

- Reclamation of Lands Affected by Salinity in Africa

## **BRUNEI DARUSSALAM**

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## **BURKINA FASO**

Capacity Building

**2002**

- Agro-ecological surveys and germplasm collection

**2003**

- Quality evaluation and utilization of salt-tolerant forages
- Salinization of irrigated lands and reclamation

Research

**Title:** Integrated crop and seed production systems under water/irrigation management in Sub-Saharan Africa

**Duration:** 2011-2015

**Collaborators:** Institut de l'Environnement et de Recherches Agricoles (INERA) of Burkina Faso, National Agricultural Research Institute (NARI) of Gambia, Institut d'Economie Rurale(IER) of Mali, Centre National de Recherche Agronomique et de Development (CNRADA) of Mauritania, (v) Institut

National de la Recherche Agronomique du Niger (INRAN) of Niger, (vi) National Agricultural Extension, Research and Liaison Services (NAERLS) of Nigeria, and (vii) Institut Senegalais de Recherches Agricoles (ISRA) of Senegal

**Funding:** IDB

## **CAMEROON**

Capacity Building

**2010**

- Biosaline agriculture technologies for arid and semi-arid regions with reference to Africa (BADEA)

**2013**

- Reclamation of Lands Affected by Salinity in Africa



## **CHAD**

Capacity Building

**2010**

- Biosaline agriculture technologies for arid and semi-arid regions with reference to Africa (BADEA)

**2013**

- Reclamation of Lands Affected by Salinity in Africa

## **COMOROS**

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## **COTE D'IVOIRE**

Capacity Building

**2010**

- Biosaline agriculture technologies for arid and semi-arid regions with reference to Africa (BADEA)

## DJIBOUTI

### MOU

- Cooperation Agreement between Life Sciences Institute of Djibouti Research Center (LSIDRC), 2008

## EGYPT

### MOU

- Desert Research Center (DRC), 2003 and 2010

### Capacity Building

#### 2002

- Design and management of irrigation systems for biosaline agriculture
- Production and management of salt-tolerant and halophyte forages and tree species
- Agro-ecological surveys and germplasm collection

#### 2003

- Quality evaluation and utilization of salt-tolerant forages
- In-situ conservation of plant genetic resources

#### 2005

- Integrated Management of Saline Water Resources and Environments for Forage Production in North Africa Region

#### 2006

- AOAD Course on the Utilization of Saline Water in Agriculture

#### 2009

- Biosaline Agriculture Technologies in the Arid and Semi-arid Regions

#### 2010

- Biosaline Agriculture Technologies and its Role in the Mitigation of Climate Change in the Arab Region

#### 2011

- Techniques for the use of treated wastewater in agricultural production and its role in food security in the Arab world

#### 2012

- Environmental impact assessment and soil and irrigation management associated with the use of marginal water in agricultural production
- Farmers' schools for forage production and utilization techniques under the use of marginal water resources

#### 2013

- Guidelines and methods for socioeconomic assessment and farm surveys
- Farmer field schools for rural family empowerment through optimization of forage and animal production

### Research

**Title:** Harnessing Salty Waters to Enhance Sustainable Livelihoods of the Rural Poor in Four Countries in West Asia and North Africa (WANA)

**Duration:** 2004 Follow-up 2005-2006

**Collaborators:** Egypt, Jordan, Syria and Tunisia

**Funding:** ICBA core, CGIAR

**Title:** Development of salinity-tolerant sorghum and pearl millet varieties for saline lands. (Next phase of Project "Evaluation of salinity tolerance, growth, yield potential and forage quality in selected

cultivars/accessions of pearl millet and sorghum under field conditions 2002-2003")

**Duration:** 2003-2006

**Collaborator:** ICRISAT

**Funding:** ICBA core, OPEC

**Title:** Development of technologies to harness the productivity potential of salt-affected areas of the Indo-Gangetic, Mekong, and Nile river basins

**Duration:** 2004-2007

**Collaborators:** IRRI; BARI, Bangladesh; Rice Research and Training Center, Egypt; Rice Research Institute of Iran

**Funding:** CGIAR Challenge Program on Food and Water through IRRI

**Title:** Sorghum and Pearl millet for enhanced crop-livestock productivity in saline lands

**Duration:** 2008-2012

**Collaborators:** NARS in Egypt, Jordan, Oman, Syria, Yemen

**Funding:** OFID, IFAD and ICBA core



## GABON

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## GAMBIA

Research

**Title:** Integrated crop and seed production systems under water/irrigation management in Sub-Saharan Africa

**Duration:** 2011-2015

**Collaborators:** Institut de l'Environnement et de Recherches Agricoles (INERA) of Burkina Faso, National Agricultural Research Institute (NARI) of Gambia, Institut d'Economie Rurale (IER) of Mali, Centre National de Recherche Agronomique et de Developpement (CNRADA) of Mauritania, (v) Institut National de la Recherche Agronomique du Niger (INRAN) of Niger, (vi) National Agricultural Extension, Research and Liaison Services (NAERLS) of Nigeria, and (vii) Institut Senegalais de Recherches Agricoles (ISRA) of Senegal

**Funding:** IDB

## GUINEA BISSAU

Capacity Building

2010

- Biosaline agriculture technologies for arid and semi-arid regions with reference to Africa (BADEA)

## INDONESIA

Capacity Building

2003

- Quality evaluation and utilization of salt tolerant forages Salinization of irrigated lands and reclamation

2006

- ICBA-IDB Apprenticeship for Human Capacity Building on Biosaline Agriculture in Islamic Countries

## IRAN

MOU

- Agricultural Research and Education Organization (AREO) previously the Agricultural Research Education and Extension Organization (AREEO), 2000

Capacity Building

2002

- Production and management of salt tolerant and halophyte forages and tree species
- Agro-ecological surveys and germplasm collection

2003

- Quality evaluation and utilization of salt tolerant forages
- Salinization of irrigated lands and reclamation

2004

- Workshop: Principles and Application of Biosaline Agriculture in Arid and Semi-Arid Regions with Reference to Iran

Research

**Title:** Production of halophytes in Iran

**Duration:** 2003-2005

**Collaborators:** ICBA, NSRC

**Funding:** NSRC

**Title:** Development of salinity-tolerant sorghum and pearl millet varieties for saline lands. (Next phase of Project "Evaluation of salinity tolerance, growth, yield potential and forage quality in selected cultivars/ accessions of pearl millet and sorghum under field conditions 2002-2003")

**Duration:** 2003-2006

**Collaborator:** ICRISAT

**Funding:** ICBA core, OPEC

**Title:** Development of technologies to harness the productivity potential of salt-affected areas of the Indo-Gangetic, Mekong, and Nile river basins

**Duration:** 2004-2007

**Collaborators:** IRRI; BARI, Bangladesh; Rice Research and Training Center, Egypt; Rice Research Institute of Iran

**Funding:** CGIAR Challenge Program on Food and Water through IRRI



## IRAQ

MOU

- Ministry of Water Resources, Republic of Iraq, 2014

Capacity Building

2003

- Quality evaluation and utilization of salt tolerant forages

2006

- AOAD Course on the Utilization of Saline Water in Agriculture

2008

- World Bank course on asset management with focus on distribution systems and business planning/risk management for the water sector in Iraq

2010

- Biosaline Agriculture Technologies and its Role in the Mitigation of Climate Change in the Arab Region

2011

- Techniques for the use of treated wastewater in agricultural production and its role in food security in the Arab world

Research

**Title:** Regeneration and dissemination of salt-tolerant germplasm

**Duration:** 2007-2013

**Collaborators:** National and international plant genetic resources programs

**Funding:** ICBA core

**Title:** Salinity in Central and Southern Iraq: better understanding of salinization processes leading to improved management practices and increased productivity

**Duration:** 2010-2013

**Collaborators:** ICARDA, IWMI, Iraq

**Funding:** ACIAR



## JORDAN

MOU

- Al Hashemite Fund for Development of Badia (HFDB), 2014

Capacity Building

2002

- Design and management of irrigation systems for biosaline agriculture
- Production and management of salt tolerant and halophyte forages and tree species

2003

- Quality evaluation and utilization of salt tolerant forages
- Salinization of irrigated lands and reclamation

2006

- Capacity Building in Integrated Management of Saline Water Resources for Forage Production in WANA Region
- AOAD course on the Utilization of Saline Water in Agriculture - Forage Project

2007

- Forage Project Irrigation and Soil Management and Modeling Working Group Meeting
- Working Group Meeting on Salt-Tolerant Forage Production and Utilization in Animal Feeding

2009

- Biosaline Agriculture Technologies in the Arid and Semi-arid Regions

2010

- Biosaline Agriculture Technologies and its Role in the Mitigation of Climate Change in the Arab Region

2011

- Techniques for the use of treated wastewater in agricultural production and its role in food security in the Arab world

2012

- Environmental impact assessment and soil and irrigation management associated with the use of marginal water in agricultural production
- Farmers' schools for forage production and utilization techniques under the use of marginal water resources

Research

**Title:** Harnessing Salty Waters to Enhance Sustainable Livelihoods of the Rural Poor in Four Countries in West Asia and North Africa (WANA)

**Duration:** 2004 Follow-up 2005-2006

**Collaborators:** Egypt, Jordan, Syria and Tunisia

**Funding:** ICBA core, CGIAR

**Title:** Expanding date palm cultivation under saline conditions in Jordan

**Duration:** 2004-2008

**Collaborator:** NCARTT

**Funding:** ICBA core, NCARTT

**Title:** Saving freshwater resources with salt-tolerant forage production in marginal areas of the West Asia and North Africa region - an opportunity to raise the incomes of the rural poor

**Duration:** 2004-2009



**Collaborators:** National agricultural research systems in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia; and the United Arab Emirates

**Funding:** IFAD; Arab Fund for Economic and Social Development; OPEC Fund for International Development; National agricultural research systems in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia; and the United Arab Emirates, ICBA core

**Title:** Sorghum and pearl millet for enhanced crop-livestock productivity in saline lands

**Duration:** 2008-2012

**Collaborators:** Egypt, Jordan, Oman, Syria, Yemen

**Funding:** OFID, IFAD, AFESD and ICBA core

**Title:** Screening and selection of Triticale genotypes for salinity tolerance and dry matter production

**Duration:** 2009-2012

**Collaborators:** Jordan, Oman, Pakistan, Palestine, Syria, Tunisia, and UAE

**Funding:** IFAD and AFESD

**Title:** The sustainable use of treated wastewater in agriculture in the Arab world

**Duration:** 2010-2013

**Collaborators:** Arab Center for the Study of Arid Zones and Dry lands (ACSAD), National Agricultural Research Systems in Jordan, Oman and Tunisia

**Funding:** IDB, ACSAD, NARS from Jordan, Oman, and Tunisia

**Title:** Adaptation to climate change in WANA marginal environments through sustainable crop and livestock diversification

**Duration:** 2010-2014

**Collaborators:** NARS in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia, and UAE

**Funding:** IFAD, AFESD, OFID, IDB

## KAZAKHSTAN

MOU

- National Academy of Sciences in the Republic of Kazakhstan, 2003 and 2014

Capacity Building

2002

- Agro-Ecological Surveys and Germplasm Collection

2003

- Quality Evaluation and Utilization of Salt Tolerant Forages
- Biosaline Agriculture and Sustainable Production Systems (Tashkent, Uzbekistan)

2004

- Biosaline Agriculture Principles & Applications with reference to Central Asia & the Caucasus Region

2005

- Germplasm Evaluation, Multiplication and Data Collection

2006

- Advances in Biosaline Agriculture with Reference to Central Asia and Caucasus Region

2007

- Production and Utilization of Salt Tolerant Forage Crops/Halophytes

2010

- Seed production, maintenance of cultivars and integrated crop management package

Research

**Title:** Sorghum and Pearl Millet for Crop Diversification Improved Crop-Livestock Productivity and Farmers Livelihood in Central Asia

**Duration:** 2011-2014

**Collaborators:** ICARDA, ICRISAT, Uzbekistan, Kazakhstan, Tajikistan

**Funding:** IDB and ICBA core

**Title:** Enabling Communities in the Aral Sea Basin to Combat Land and Water Resource Degradation through the Creation of 'Bright' Spots

**Duration:** 2005-2007

**Collaborators:** IWMI, ICARDA and NARES of Uzbekistan, Kazakhstan and Turkmenistan

**Funding:** Asian Development Bank



## KUWAIT

Capacity Building

2001

- Genebank Operations: Germplasm and Data Management

2003

- Quality Evaluation and Utilization of Salt Tolerant Forages

2006

- AOAD training on "Train the trainers on water awareness in the Arabian Peninsula"
- AOAD Course on the Utilization of Saline Water in Agriculture

2008

- Regional training workshop on Biosaline Agriculture Technologies for the Arab Region

2009

- Biosaline Agriculture Technologies in the Arid and Semi-arid Regions

2010

- Biosaline Agriculture Technologies and its Role in the Mitigation of Climate Change in the Arab Region

2011

- Techniques for the use of treated wastewater in agricultural production and its role in food security in the Arab world



## KYRGYZ REPUBLIC

Capacity Building

2003

- Quality evaluation and utilization of salt tolerant forages
- Salinization of irrigated lands and reclamation
- Biosaline agriculture and sustainable production systems (Tashkent, Uzbekistan)

2004

- Biosaline Agriculture Principles & Applications with reference to Central Asia & the Caucasus Region

2006

- Advances in Biosaline Agriculture with Reference to Central Asia and Caucasus Region

## LEBANON

Capacity Building

2002

- Design and Management Irrigation Systems for Biosaline Agriculture
- Production and Management of Salt Tolerant and Halophyte Forages and Tree Species

2006

- AOAD Course on the Utilization of Saline Water in Agriculture

2010

- Biosaline Agriculture Technologies and its Role in the Mitigation of Climate Change in the Arab Region

2011

- Techniques for the use of treated wastewater in agricultural production and its role in food security in the Arab world

## LIBYA

Capacity Building

2003

- Salinization of Irrigated Lands and Reclamation

2006

- AOAD Course on the Utilization of Saline Water in Agriculture

2008

- Regional training workshop on Biosaline Agriculture Technologies for the Arab Region

2009

- Biosaline Agriculture Technologies in the Arid and Semi-arid Regions

## MALAYSIA

Capacity Building

2002

- Agro-Ecological Surveys and Germplasm Collection

2003

- Quality Evaluation and Utilization of Salt Tolerant Forages

## MALDIVES

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## MALI

Capacity Building

2002

- Agro-ecological surveys and germplasm collection

2003

- Quality evaluation and utilization of salt tolerant forages
- Salinization of irrigated lands and reclamation

2013

- Reclamation of Lands Affected by Salinity in Africa

Research

**Title:** Integrated crop and seed production systems under water/irrigation management in Sub-Saharan Africa

**Duration:** 2011-2015

**Collaborators:** Institut de l'Environnement et de Recherches Agricoles (INERA) of Burkina Faso, National Agricultural Research Institute (NARI) of Gambia, Institut d'Economie Rurale (IER) of Mali, Centre National de Recherche Agronomique et de Developpement (CNRADA) of Mauritania, (v) Institut National de la Recherche Agronomique du Niger (INRAN) of Niger, (vi) National Agricultural Extension, Research and Liaison Services (NAERLS) of Nigeria, and (vii) Institut Senegalais de Recherches Agricoles (ISRA) of Senegal

**Funding:** IDB

## MAURITANIA

Capacity Building

2002

- Production and Management of Salt Tolerant and Halophyte Forages and Tree Species

2005

- Integrated Management of Saline Water Resources and Environments for Forage Production in North Africa Region

2008

- Regional training workshop on Biosaline Agriculture Technologies for the Arab Region

Research

**Title:** Integrated crop and seed production systems under water/irrigation management in Sub-Saharan Africa

**Duration:** 2011-2015

**Collaborators:** Institut de l'Environnement et de Recherches Agricoles (INERA) of Burkina Faso, National Agricultural Research Institute (NARI) of Gambia, Institut d'Economie Rurale (IER) of Mali, Centre National de Recherche Agronomique et de Development (CNRADA) of Mauritania, (v) Institut National de la Recherche Agronomique du Niger (INRAN) of Niger, (vi) National Agricultural Extension, Research and Liaison Services (NAERLS) of Nigeria, and (vii) Institut Senegalais de Recherches Agricoles (ISRA) of Senegal

**Funding:** IDB



## MOROCCO

MOU

- North-South Center for Social Sciences (NRCS) Ibn Zhor University of Agadir (Morocco), 2012

Capacity building

2002

- Production and Management of Salt Tolerant and Halophyte Forages and Tree Species

2005

- Integrated Management of Saline Water Resources and Environments for Forage Production in North Africa Region

2006

- AOAD Course on the Utilization of Saline Water in Agriculture

2008

- Regional training workshop on Biosaline Agriculture Technologies for the Arab Region

2009

- Biosaline Agriculture Technologies in the Arid and Semi-arid Regions

2011

- Techniques for the use of treated wastewater in agricultural production and its role in food security in the Arab world

## MOZAMBIQUE

Capacity building

2007

- Biosaline Agriculture Technologies for Arid and Semi-arid Regions with Reference to Africa (BADEA course)

2011

- Biosaline agriculture technologies and its role in the mitigation of climate change in Africa (BADEA)

## NIGER

MOU

- Institute National de Recherches Agronomiques du Niger (NIRAN), 2004

Capacity building

2006

- Introduction and Application of Biosaline Agriculture with reference to Niger
- COMSTECH-IDB Joint Scheme on Strengthening of Centers of Excellence - Internship Program on Biosaline Agriculture

2010

- Biosaline agriculture technologies for arid and semi-arid regions with reference to Africa (BADEA)

2013

- Reclamation of Lands Affected by Salinity in Africa

Research

**Title:** Integrated crop and seed production systems under water/irrigation management in Sub-Saharan Africa

**Duration:** 2011-2015

**Collaborators:** Institut de l'Environnement et de Recherches Agricoles (INERA) of Burkina Faso,

National Agricultural Research Institute (NARI) of Gambia, Institut d'Economie Rurale (IER) of Mali, Centre National de Recherche Agronomique et de Development (CNRADA) of Mauritania, (v) Institut National de la Recherche Agronomique du Niger (INRAN) of Niger, (vi) National Agricultural Extension, Research and Liaison Services (NAERLS) of Nigeria, and (vii) Institut Senegalais de Recherches Agricoles (ISRA) of Senegal

**Funding:** IDB

## NIGERIA

Capacity building

2011

- Biosaline agriculture technologies and its role in the mitigation of climate change in Africa (BADEA)

Research

**Title:** Integrated crop and seed production systems under water/irrigation management in Sub-Saharan Africa

**Duration:** 2011-2015

**Collaborators:** Institut de l'Environnement et de Recherches Agricoles (INERA) of Burkina Faso, National Agricultural Research Institute (NARI) of Gambia, Institut d'Economie Rurale (IER) of Mali, Centre National de Recherche Agronomique et de Development (CNRADA) of Mauritania, (v) Institut National de la Recherche Agronomique du Niger (INRAN) of Niger, (vi) National Agricultural Extension, Research and Liaison Services (NAERLS) of Nigeria, and (vii) Institut Senegalais de Recherches Agricoles (ISRA) of Senegal

**Funding:** IDB



## OMAN

Capacity building

2001

- Irrigation with brackish water
- Genebank operations: germplasm and data management

2002

- Production and management of salt tolerant and halophyte forages and tree species
- Agro-ecological surveys and germplasm collection

2003

- Quality evaluation and utilization of salt tolerant forages
- Salinization of irrigated lands and reclamation
- In-situ conservation of plant genetic resources

2006

- AOAD training on "Train the trainers on water awareness in the Arabian Peninsula"
- Capacity Building in Integrated Management of Saline Water Resources for Forage Production in WANA Region
- Quality Assurance of Analytical Laboratories Workshop
- AOAD course on the Utilization of Saline Water in Agriculture - Forage Project

2007

- Forage Project Irrigation and Soil Management and Modeling Working Group Meeting
- Working Group Meeting on Salt-Tolerant Forage Production and Utilization in Animal Feeding

2008

- Regional training workshop on Biosaline Agriculture Technologies for the Arab Region

2009

- Biosaline Agriculture Technologies in the Arid and Semi-arid Regions

2010

- Biosaline Agriculture Technologies and its Role in the Mitigation of Climate Change in the Arab Region

2011

- Techniques for the use of treated wastewater in agricultural production and its role in food security in the Arab world

2012

- Environmental impact assessment and soil and irrigation management associated with the use of marginal water in agricultural production
- Farmers' schools for forage production and utilization techniques under the use of marginal water resources

2013

- Guidelines and methods for socioeconomic assessment and farm surveys

Research

**Title:** Demonstration of biosaline agriculture at Nimr, Sultanate of Oman

**Duration:** 2001-2004

**Contracted by:** Petroleum Development Oman LLC

**Funding:** Petroleum Development Oman LLC

**Title:** Development of salt-tolerant sorghum and pearl millet varieties for saline lands. (Next phase of Project

“Evaluation of salinity tolerance, growth, yield potential and forage quality in selected cultivars/accessions of pearl millet and sorghum under field conditions 2002-2003”)

**Duration:** 2003-2006

**Collaborator:** ICRISAT

**Funding:** ICBA core, OPEC

**Title:** Evaluation of salinity tolerance and yield in 280 barley varieties and accessions (Phase II)

**Duration:** 2004-2006

**Collaborator:** ICARDA

**Funding:** ICBA core

**Title:** Saving freshwater resources with salt-tolerant forage production in marginal areas of the West Asia and North Africa region - an opportunity to raise the incomes of the rural poor

**Duration:** 2004-2009

**Collaborators:** National agricultural research systems in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia; and the United Arab Emirates

**Funding:** IFAD; Arab Fund for Economic and Social Development; OPEC Fund for International Development; National agricultural research systems in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia; and the United Arab Emirates, ICBA core

**Title:** Screening of Sesbania, Cowpea, Guar and sunflower accessions for salinity-tolerance and yield

**Duration:** 2004-2012

**Collaborators:** Oman and UAE

**Funding:** ICBA core, IFAD and AFESD

**Title:** Management of salt-affected soils and water for sustainable agriculture

**Duration:** 2006-2009 **Collaborator:** Sultan Qabous University, Oman

**Funding:** ICBA core, Sultan Qabous University

**Title:** Regeneration and dissemination of salt-tolerant germplasm

**Duration:** 2007-2013

**Collaborators:** National and international plant genetic resources programs

**Funding:** ICBA core

**Title:** Sorghum and pearl millet for enhanced crop-livestock productivity in saline lands

**Duration:** 2008-2012

**Collaborators:** Egypt, Jordan, Oman, Syria, Yemen

**Funding:** OFID, IFAD, AFESD and ICBA core

**Title:** Feasibility of Managed Aquifer Recharge using excess treated wastewater in Oman

**Duration:** 2009-2012

**Collaborators:** Sultan Qabous University

**Funding:** ICBA core, HM Strategic Research Fund

**Title:** National strategy to combat salinity in Oman

**Duration:** 2009-2012

**Collaborator:** Oman Ministry of Agriculture

**Funding:** Oman Ministry of Agriculture

**Title:** Adaptation to climate change in WANA marginal environments through sustainable crop and livestock diversification

**Duration:** 2010-2014

**Collaborator:** NARS in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia, and UAE

**Funding:** IFAD, AFESD, OFID, IDB

**Title:** The sustainable use of treated wastewater in agriculture in the Arab world

**Duration:** 2010-2013

**Collaborators:** Arab Center for the Study of Arid Zones and Dry lands (ACSAD), National Agricultural Research Systems in Jordan, Oman and Tunisia

**Funding:** IDB, ACSAD, NARS from Jordan, Oman, and Tunisia

**Title:** Workshop on Environmental Cost and Changing Face of Agriculture in the Gulf States-The 2012 Gulf Research Meeting

**Duration:** 2011-2012

**Collaborator:** Sultan Qabous University

**Funding:** Sultan Qabous University



## PAKISTAN

MOU

- Pakistan Agricultural Research Council (PARC), 2000

Capacity Building

2002

- Design and management of irrigation systems for biosaline agriculture

2003

- Quality evaluation and utilization of salt tolerant forages
- In-situ conservation of plant genetic resources

2006

- Capacity Building in Integrated Management of Saline Water Resources for Forage Production in WANA Region
- AOAD course on the Utilization of Saline Water in Agriculture - Forage Project

2007

- Forage Project Irrigation and Soil Management and Modeling
- Working Group Meeting Working Group Meeting on Salt-Tolerant Forage Production and Utilization in Animal Feeding

## Research

**Title:** Use of low quality water for productive use of desert and salt-affected areas in Pakistan

**Duration:** 2003-2005

**Collaborator:** PARC

**Funding:** ICBA core, PARC

**Title:** Saving freshwater resources with salt-tolerant forage production in marginal areas of the West Asia and North Africa region - an opportunity to raise the incomes of the rural poor

**Duration:** 2004-2009

**Collaborators:** National agricultural research systems in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia; and the United Arab Emirates

**Funding:** IFAD; Arab Fund for Economic and Social Development; OPEC Fund for International Development; National agricultural research systems in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia; and the United Arab Emirates, ICBA core

**Title:** Biosaline Agroforestry: Remediation of saline wastelands through production of renewable energy, biomaterials and fodder

**Duration:** 2007-2010

**Collaborators:** ICBA, OASE (Netherlands); Utrecht University (Netherlands); BARI (Bangladesh); CSSRI (India); PARC (Pakistan); ACACIA (Netherlands); CITA (Netherlands); Universität Hohenheim (Netherlands)

**Funding:** European Union

**Title:** Regeneration and dissemination of salt-tolerant germplasm

**Duration:** 2007-2013

**Collaborators:** National and international plant genetic resources programs

**Funding:** ICBA core

**Title:** Adaptation to climate change in WANA marginal environments through sustainable crop and livestock diversification

**Duration:** 2010-2014

**Collaborator:** NARS in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia, and UAE

**Funding:** IFAD, AFESD, OFID, IDB



## PALESTINE

### MOU

- Palestinian National Center for Agricultural Studies (NARC), 2009
- Palestinian Hydrology Group, 2014
- Palestinian Water Authority, 2014

### Capacity Building

#### 2002

- Design and management of irrigation systems for biosaline agriculture
- Agro-ecological surveys and germplasm collection

#### 2003

- Quality evaluation and utilization of salt tolerant forages

#### 2006

- Capacity Building in Integrated Management of Saline Water Resources for Forage Production in WANA Region
- AOAD course on the Utilization of Saline Water in Agriculture - Forage Project

#### 2007

- Forage Project Irrigation and Soil Management and Modeling Working Group Meeting
- Working Group Meeting on Salt-Tolerant Forage Production and Utilization in Animal Feeding

#### 2009

- Biosaline Agriculture Technologies in the Arid and Semi-arid Regions

#### 2011

- Techniques for the use of treated wastewater in agricultural production and its role in food security in the Arab world

#### 2012

- Environmental impact assessment and soil and irrigation management associated with the use of marginal water in agricultural production

### Research

**Title:** Saving freshwater resources with salt-tolerant forage production in marginal areas of the West Asia and North Africa region - an opportunity to raise the incomes of the rural poor

**Duration:** 2004-2009

**Collaborators:** National agricultural research systems in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia; and the United Arab Emirates

**Funding:** IFAD; Arab Fund for Economic and Social Development; OPEC Fund for International Development; National agricultural research systems in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia; and the United Arab Emirates, ICBA core

**Title:** Adaptation to climate change in WANA marginal environments through sustainable crop and livestock diversification

**Duration:** 2010-2014

**Collaborators:** NARS in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia, and UAE

**Funding:** IFAD, AFESD, OFID, IDB

## **QATAR**

### Capacity Building

**2006**

- AOAD training on “Train the trainers on water awareness in the Arabian Peninsula”
- AOAD Course on the Utilization of Saline Water in Agriculture

**2011**

- Biosaline agriculture technologies in arid areas



## **SAUDI ARABIA**

### MOU

- The King Abdul Aziz City for Science and technology, 2001
- The Arabian Saline Water Technology Company (BEHAR), 2001
- The National Prawn Company, 2004
- Cooperation Agreement with King Abdul Aziz University (KAU), Faculty of Meteorology, Environment & Arid Land Agriculture, 2008
- King Abdullah University of Science and Technology (KAUST), 2013

### Capacity Building

**2002**

- Agro-ecological surveys and germplasm collection

**2003**

- In-situ conservation of plant genetic resources

**2006**

- AOAD training on “Train the trainers on water awareness in the Arabian Peninsula”
- AOAD Course on the Utilization of Saline Water in Agriculture

**2013**

- Guidelines and methods for socioeconomic assessment and farm surveys

### Research

**Title:** Biosaline Agriculture Development Program at the NPC Site, Al-Laith, Saudi Arabia

**Duration:** 2004-2006 (extended to 2008)

**Contracted by:** National Prawn Company, Saudi Arabia

**Title:** Developing the OIC’s Water Vision

**Duration:** 2010-2012

**Collaborators:** Organization of Islamic Cooperation, Islamic Development Bank

**Funding:** ICBA core

## **SENEGAL**

### MOU

- Cooperation Agreement with Institut Senegalais De Recherches Agricoles/The Senegalese Institute of Agricultural Research (ISRA), DAKAR, SENEGAL, 2007

### Capacity Building

**2002**

- Design and management of irrigation systems for biosaline agriculture
- Production and management of salt tolerant and halophyte forages and tree species
- Agro-ecological surveys and germplasm collection

**2003**

- Quality evaluation and utilization of salt tolerant forages
- Salinization of Irrigated Lands and Reclamation

**2007**

- Biosaline Agriculture Technologies for Arid and Semi-arid Regions with Reference to Africa (BADEA course)

**2010**

- Biosaline agriculture technologies for arid and semi-arid regions with reference to Africa (BADEA)

### Research

**Title:** Integrated crop and seed production systems under water/irrigation management in Sub-Saharan Africa

**Duration:** 2011-2015

**Collaborators:** Institut de l’Environnement et de Recherches Agricoles (INERA) of Burkina Faso, National Agricultural Research Institute (NARI) of Gambia, Institut d’Economie Rurale (IER) of Mali, Centre National de Recherche Agronomique et de Development (CNRADA) of Mauritania, (v) Institut

National de la Recherche Agronomique du Niger (INRAN) of Niger, (vi) National Agricultural Extension, Research and Liaison Services (NAERLS) of Nigeria, and (vii) Institut Senegalais de Recherches Agricoles (ISRA) of Senegal  
**Funding:** IDB

## **SIERRA LEONE**

Capacity Building  
2007

- Biosaline Agriculture Technologies for Arid and Semi-arid Regions with Reference to Africa (BADEA course)

## **SOMALIA**

Capacity Building  
2003

- Salinization of irrigated lands and reclamation

2004

- Course: Interactive introduction to agronomic practices and crops for successful agricultural production in saline conditions

2006

- ICBA-IDB Apprenticeship for Human Capacity Building on Biosaline Agriculture in Islamic Countries

## **SUDAN**

MOU

- Ministry of Agriculture, Animal Wealth and Natural Resources, Al Khartoum State, 2001
- Arab Authority for Agricultural Investment and Development (AAAID), 2001

Capacity Building

2002

- Design and management of irrigation systems for biosaline agriculture
- Production and management of salt tolerant and halophyte forages and tree species
- Agro-ecological surveys and germplasm collection

2003

- Quality evaluation and utilization of salt tolerant forages
- Salinization of irrigated lands and reclamation
- In-situ conservation of plant genetic resources

2006

- AOAD Course on the Utilization of Saline Water in Agriculture

2008

- Regional training workshop on Biosaline Agriculture Technologies for the Arab Region

2009

- Biosaline Agriculture Technologies in the Arid and Semi-arid Regions

2010

- Biosaline Agriculture Technologies and its Role in the Mitigation of Climate Change in the Arab Region

## **SURINAME**

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## **SYRIA**

Capacity Building

2002

- Design and management of irrigation systems for biosaline agriculture
- Production and management of salt tolerant and halophyte forages and tree species

2003

- Salinization of irrigated lands and reclamation
- In-situ conservation of plant genetic resources

2006

- Capacity Building in Integrated Management of Saline Water Resources for Forage Production in WANA Region
- AOAD course on the Utilization of Saline Water in Agriculture - Forage Project

2007

- Forage Project Irrigation and Soil Management and Modeling Working Group Meeting

2008

- Regional training workshop on Biosaline Agriculture Technologies for the Arab Region

2009

- Biosaline Agriculture Technologies in the Arid and Semi-arid Regions

2010

- Biosaline Agriculture Technologies and its Role in the Mitigation of Climate Change in the Arab Region

2011

- Techniques for the use of treated wastewater in agricultural production and its role in food security in the Arab world



Research

**Title:** Harnessing Salty Waters to Enhance Sustainable Livelihoods of the Rural Poor in Four Countries in West Asia and North Africa (WANA)

**Duration:** 2004 Follow-up 2005-2006

**Collaborators:** Egypt, Jordan, Syria and Tunisia

**Funding:** ICBA core, CGIAR

**Title:** Saving freshwater resources with salt-tolerant forage production in marginal areas of the West Asia and North Africa region - an opportunity to raise the incomes of the rural poor

**Duration:** 2004-2009

**Collaborators:** National agricultural research systems in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia; and the United Arab Emirates

**Funding:** IFAD; Arab Fund for Economic and Social Development; OPEC Fund for International Development; National agricultural research systems in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia; and the United Arab Emirates, ICBA core

**Title:** Adaptation to climate change in WANA marginal environments through sustainable crop and livestock diversification

**Duration:** 2010-2014

**Collaborators:** NARS in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia, and UAE

**Funding:** IFAD, AFESD, OFID, IDB

**Title:** Sorghum and pearl millet for enhanced crop-livestock productivity in saline lands

**Duration:** 2008-2012

**Collaborators:** Egypt, Jordan, Oman, Syria, Yemen

**Funding:** OFID, IFAD, AFESD and ICBA core

## TAJIKISTAN

Capacity building

2003

- Quality evaluation and utilization of salt tolerant forages
- Salinization of irrigated lands and reclamation
- Biosaline agriculture and sustainable production systems (Tashkent, Uzbekistan)

2004

- Biosaline Agriculture Principles & Applications with reference to Central Asia & the Caucasus Region

2006

- Advances in Biosaline Agriculture with Reference to Central Asia and Caucasus Region

2007

- Production and Utilization of Salt Tolerant Forage Crops/Halophytes

2012

- Seed production, maintenance of cultivars and integrated crop management package

Research

**Title:** Sorghum and Pearl Millet for Crop Diversification Improved Crop-Livestock Productivity and Farmers Livelihood in Central Asia

**Duration:** 2011-2014

**Collaborators:** ICARDA, ICRISAT, Uzbekistan, Kazakhstan, Tajikistan

**Funding:** IDB and ICBA core

**Title:** Introduction of Biosaline Agriculture technologies for improvement of degraded abandoned farms in Tajikistan

**Duration:** 2007-2009

**Collaborators:** ICBA, Tajikistan Academy of Agricultural Sciences (TAAS)

**Funding:** Asian Development Bank and Islamic Development Bank

## TOGO

Capacity building

2010

- Biosaline agriculture technologies for arid and semi-arid regions with reference to Africa (BADEA)



## TUNISIA

MOU

- Institut National Meteorologie (INM), 2013
- Institut National des Grandes Cultures (INGC), 2013

Capacity Building

2002

- Production and management of salt tolerant and halophyte forages and tree species
- Agro-ecological surveys and germplasm collection

2003

- Quality evaluation and utilization of salt tolerant forages
- Salinization of irrigated lands and reclamation

2005

- Integrated Management of Saline Water Resources and Environments for Forage Production in North Africa Region

2006

- Capacity Building in Integrated Management of Saline Water Resources for Forage Production in WANA Region
- AOAD course on the Utilization of Saline Water in Agriculture - Forage Project

2007

- AOAD course on the Utilization of Saline Water in Agriculture - Forage Project
- Working Group Meeting on Salt-Tolerant Forage Production and Utilization in Animal Feeding

2008

- Regional training workshop on Biosaline Agriculture Technologies for the Arab Region

2009

- Biosaline Agriculture Technologies in the Arid and Semi-arid Regions

2010

- Biosaline Agriculture Technologies and its Role in the Mitigation of Climate Change in the Arab Region

2011

- Techniques for the use of treated wastewater in agricultural production and its role in food security in the Arab world

2012

- Environmental impact assessment and soil and irrigation management associated with the use of marginal water in agricultural production
- Farmers' schools for forage production and utilization techniques under the use of marginal water resources

Research

**Title:** Harnessing Salty Waters to Enhance Sustainable Livelihoods of the Rural Poor in Four Countries in West Asia and North Africa (WANA)

**Duration:** 2004 Follow-up 2005-2006

**Collaborators:** Egypt, Jordan, Syria and Tunisia

**Funding:** ICBA core, CGIAR

**Title:** Saving freshwater resources with salt-tolerant forage production in marginal areas of the West Asia and North Africa region - an opportunity to raise the incomes of the rural poor

**Duration:** 2004–2009

**Collaborators:** National agricultural research systems in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia; and the United Arab Emirates

**Funding:** IFAD; Arab Fund for Economic and Social Development; OPEC Fund for International Development; National agricultural research systems in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia; and the United Arab Emirates, ICBA core

**Title:** Regional water flow modeling using NASA's MENA-LDAS

**Duration:** 2009–2012

**Collaborators:** USAID, NASA, ICBA

**Funding:** USAID

**Title:** The sustainable use of treated wastewater in agriculture in the Arab world

**Duration:** 2010-2013

**Collaborators:** ACSAD, NARS from Jordan, Oman, and Tunisia

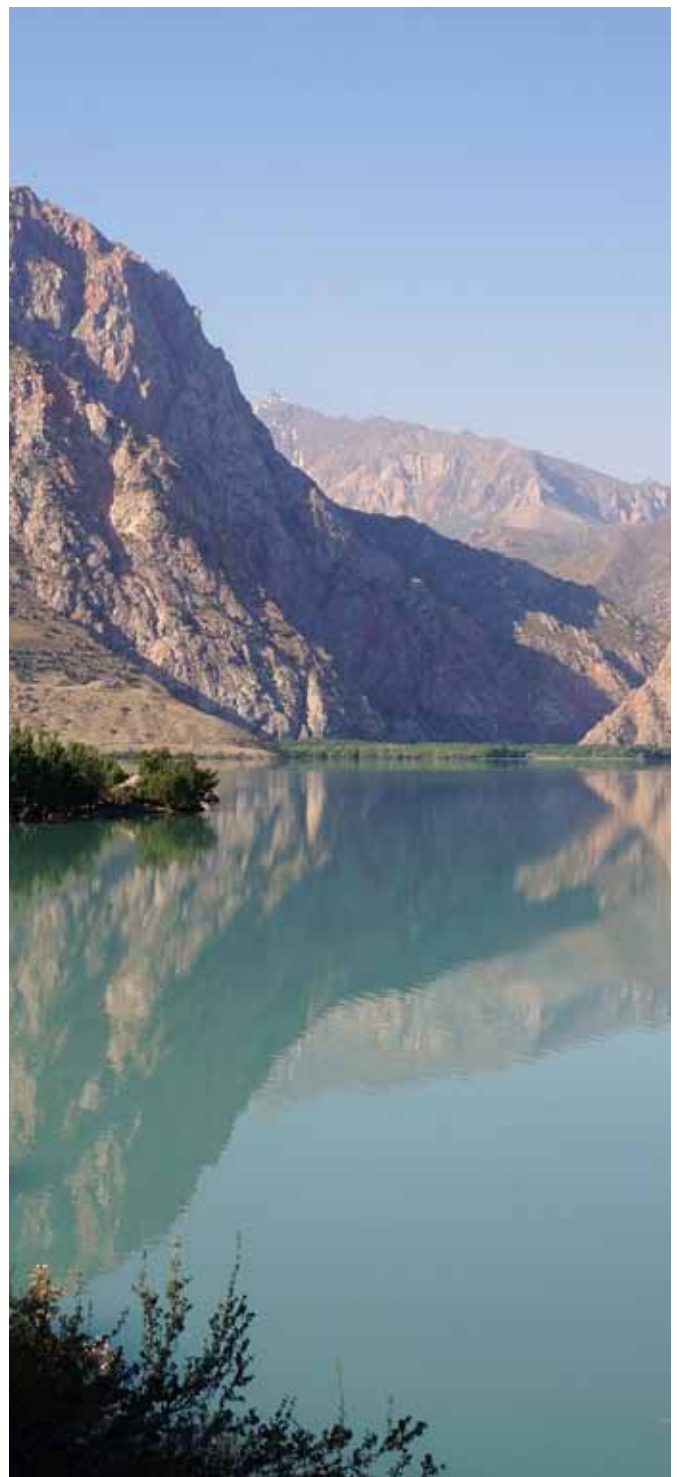
**Funding:** ACSAD, IDB, NARS from Jordan, Oman, and Tunisia

**Title:** Adaptation to climate change in WANA marginal environments through sustainable crop and livestock diversification

**Duration:** 2010-2014

**Collaborators:** NARS in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia, and UAE

**Funding:** IFAD, AFESD, OFID, IDB



## TURKEY

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## TURKMENISTAN

Capacity Building

2002

- Agro-ecological surveys and germplasm collection

2003

- Biosaline agriculture and sustainable production systems (Tashkent, Uzbekistan)

2004

- Biosaline Agriculture Principles & Applications with reference to Central Asia & the Caucasus Region

2006

- Advances in Biosaline Agriculture with Reference to Central Asia and Caucasus Region

2007

- Production and Utilization of Salt Tolerant Forage Crops/Halophytes

Research

**Title:** Enabling Communities in the Aral Sea Basin to Combat Land and Water Resource Degradation through the Creation of 'Bright' Spots

**Duration:** 2005-2007

**Collaborators:** IWMI, ICARDA and NARES of Uzbekistan, Kazakhstan and Turkmenistan

**Funding:** Asian Development Bank

**Title:** Improving livelihoods of rural communities under saline desert environments in Turkmenistan

**Duration:** 2010-2012

**Collaborators:** DIFF and Turkmenistan

**Funding:** IDB

## UGANDA

Receives Biosalinity News



## UNITED ARAB EMIRATES

MOU

- Environmental Research and Wildlife Development Agency, 2001
- United Arab Emirates University, 2002 and 2007
- Al Ain Municipality, 2009
- Ministry of Environment and Water, 2009
- Abu Dhabi Farmers Service Center, 2010
- Emirates Institution for Advanced Science and Technology (EIAST), 2010
- University of Sharjah, 2012
- The Canadian University of Dubai, 2013
- Masdar Institute of Science and Technology, 2014

Capacity Building

2000

- Design and analyses of laboratory and field experiments

2001

- Irrigation with brackish water
- Propagation and management of halophytes for optimal productivities
- Genebank operations: germplasm and data management

2002

- Design and management of irrigation systems for biosaline agriculture
- Production and management of salt tolerant and halophyte forages and tree species
- Agro-ecological surveys and germplasm collection
- Quality evaluation and utilization of salt tolerant forages

2003

- Salinization of irrigated lands and reclamation
- In-situ conservation of plant genetic resources

2004

- Design of irrigation systems

2005

- Management of Salt-Affected Ecosystems

2006

- Soil Survey Concepts and Framework
- AOAD training on "Train the trainers on water awareness in the Arabian Peninsula"
- Capacity Building in Integrated Management of Saline Water Resources for Forage Production in WANA Region
- Communications Skills
- AOAD Course on the Utilization of Saline Water in Agriculture

2007

- Laboratory Techniques in Soil
- Forage Project Irrigation and Soil Management and Modeling Working Group Meeting
- Working Group Meeting on Salt-Tolerant Forage Production and Utilization in Animal Feeding

2008

- Modeling of floods and their effects on dams and surrounding areas

2009

- Soil Survey and Sustainable Use of Land Resources in Abu Dhabi Emirate
- Agricultural Management under Water and Soil Saline Conditions

- Biosaline Agriculture Technologies in the Arid and Semi-arid Regions

#### 2010

- Biosaline Agriculture Technologies and its Role in the Mitigation of Climate Change in the Arab Region

#### 2011

- Introduction to biosaline agriculture: Management of salt-tolerant crops/forages, soil and water
- Techniques for the use of treated wastewater in agricultural production and its role in food security in the Arab world

#### 2012

- Environmental impact assessment and soil and irrigation management associated with the use of marginal water in agricultural production
- Integrated Management Technologies of Saline Water
- Integrated Management Technologies of Marginal Water (Treated Wastewater)
- Farmers' schools for forage production and utilization techniques under the use of marginal water resources

#### 2013

- Guidelines and methods for socioeconomic assessment and farm surveys
- Irrigation Scheduling and Water Consumption
- Utilization of Soil and Thematic Maps for Agricultural Development
- Plant Genetic Resources in the UAE
- Production Systems of Non-conventional Forage Crops
- Date Palm Production Systems in Saline Environments
- GIS for Water Resources and Irrigation Management
- Economics and productivity of water in agriculture sector
- Production Systems of Field and Forage Crops in the UAE

#### Research

**Title:** Sustainable utilization of saline groundwater and wastelands for plant production

**Duration:** 2000-2005

**Collaborators:** International Atomic Energy Agency; ministry of Agriculture and Fisheries

**Funding:** International Atomic Energy Agency; Ministry of Agriculture and Fisheries

**Title:** Investigation of elite date palm varieties for salt tolerance-Phase I

**Duration:** 2001-2010

**Collaborator:** Ministry of Agriculture and Fisheries/MOEW

**Funding:** ICBA core, Ministry of Agriculture and Fisheries

**Title:** Increasing biodiversity of mangrove species in UAE: Introduction and adaptation of new species

**Duration:** 2002-2004

**Collaborator:** Environmental Research and Wildlife Development Agency

**Funding:** ICBA; Environmental Research and Wildlife Development Agency

**Title:** Optimizing management practices for maximum production of two salt-tolerant grasses: *Sporobolus virginicus* and *Distichlis spicata*

**Duration:** 2002-2006

**Collaborator:** UAEU

**Funding:** ICBA core

**Title:** Optimizing management practices for maximum production of three Atriplex species under high salinity levels-Phase I

**Duration:** 2002-2010

**Collaborator:** UAEU Funding: ICBA core

**Title:** Managing salinity and water logging in coastal agricultural areas in Abu Dhabi

**Duration:** 2003-2004

**Funding:** Sewerage Projects Committee, Abu Dhabi Municipality

**Title:** Greening pilot plot of 2000m<sup>2</sup> with salt tolerant plants, Qareen Al Eish

**Duration:** 2003-2004

**Funding:** Public works Department Abu Dhabi

**Title:** Development of salinity-tolerant sorghum and pearl millet varieties for saline lands. (Next phase of Project "Evaluation of salinity tolerance, growth, yield potential and forage quality in selected cultivars/ accessions of pearl millet and sorghum under field conditions 2002-2003")

**Duration:** 2003-2006

**Collaborator:** ICRISAT

**Funding:** ICBA core, OPEC

**Title:** Development of sustainable salt-tolerant forages for sheep and goat production

**Duration:** 2003-2006

**Collaborator:** UAEU

**Funding:** ICBA core

**Title:** Application of biosaline agriculture in a demonstration farm in the Northern Emirates of the UAE

**Duration:** 2003-2008

**Collaborators:** MAF, MoEW

**Funding:** ICBA core, AFESD

**Title:** Feasibility study for biosaline agriculture in the United Arab Emirates

**Duration:** 2004-2005

**Collaborators:** Ministry of Agriculture and Fisheries, UAE

**Funding:** ICBA core, IAEA, Ministry of Agriculture and Fisheries (UAE)

**Title:** Evaluation of salinity tolerance and yield in 280 barley varieties and accessions (Phase II)

**Duration:** 2004-2006

**Collaborator:** ICARDA

**Funding:** ICBA core

**Title:** Response of two prominent grasses: indigenous *Dhai*, *Lasirus scidus* and introduced African variety of *Cenchrus ciliaris* to water salinity

**Duration:** 2004-2006

**Collaborator:** Ministry of Agriculture and Fisheries

**Funding:** ICBA core, Ministry of Agriculture and Fisheries

**Title:** Saving freshwater resources with salt-tolerant forage production in marginal areas of the West Asia and North Africa region - an opportunity to raise the incomes of the rural poor

**Duration:** 2004-2009

**Collaborators:** National agricultural research systems in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia; and the United Arab Emirates

**Funding:** IFAD; Arab Fund for Economic and Social Development; OPEC Fund for International Development; National agricultural research systems in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia; and the United Arab Emirates, ICBA core

**Title:** Propagation and development of *Distichlis spicata* var. Yensen-4a (NyPa forage) under arid environment

**Duration:** 2004-2013

**Collaborator:** NyPa International

**Funding:** ICBA core

**Title:** Screening for salinity tolerance among large collections of buffel grass (*Cenchrus ciliaris*), fodder beet and safflower (Phase II)

**Duration:** 2005-2007

**Collaborator:** MAF

**Funding:** ICBA core

**Title:** Soil Survey of the Emirate of Abu Dhabi

**Duration:** 2005-2009

**Collaborator:** Environment Agency—Abu Dhabi

**Funding:** ICBA core, Abu Dhabi Government (UAE)

**Title:** Water Master Plan for Abu Dhabi Emirate

**Duration:** 2007-2009

**Collaborator:** EAD

**Funding:** Environment Agency-Abu Dhabi (EAD)

**Title:** AFG treated water experiments

**Duration:** 2007-2009

**Collaborator:** First AFG

**Funding:** First AFG

**Title:** Regeneration and dissemination of salt-tolerant germplasm

**Duration:** 2007-2013

**Collaborators:** National and international plant genetic resources programs

**Funding:** ICBA core

**Title:** Safe disposal of brine from the reverse osmosis desalination plants of UAE agricultural farms

**Duration:** 2008-2010

**Funding:** Ministry of Environment and Water of UAE

**Title:** Irrigation planning and management for UAE

**Duration:** 2008-2010

**Funding:** Ministry of Environment and Water of UAE

**Title:** Abu Dhabi Genebank and Botanical Garden Site Assessment

**Duration:** 2009

**Funding:** Environment Agency-Abu Dhabi

**Title:** International Conference on Soil Classification and Reclamation of Degraded Lands in Arid Environments and Launch of Abu Dhabi Soil Survey Report

**Duration:** 2009-2010

**Funding:** Environment Agency-Abu Dhabi

**Title:** Legal and regulatory framework of Abu Dhabi Emirate water law

**Duration:** 2009-2010

**Funding:** Environment Agency-Abu Dhabi (EAD)

**Title:** Establishment of Abu Dhabi Water Council

**Duration:** 2009-2010

**Funding:** Environment Agency-Abu Dhabi (EAD)

**Title:** Recycled Wastewater Strategic Plan for Abu Dhabi Emirate

**Duration:** 2009-2010

**Funding:** Environment Agency-Abu Dhabi (EAD)

**Title:** United Arab Emirates Water Conservation Strategy

**Duration:** 2009-2010

**Funding:** MOEW

**Title:** Soil improvement through the use of Rhizosphere Bacteria, Fertilizer, and Mycorrhizal fungi to grow Sweet Corn (*Zea Mays* var. rugosa)

**Duration:** 2009-2011

**Collaborator:** IGZ Germany

**Funding:** IGZ Germany

**Title:** The role of Arbuscular Mycorrhiza (AM) Fungi on the establishment of date palm (*Phoenix dactylifera* L.) under saline conditions in the Arabian Peninsula

**Duration:** 2009-2012

**Collaborators:** MOEW, BioMyc

**Funding:** MOEW, BioMyc

**Title:** Soil Survey of Northern Emirates-Soil Analytical Services

**Duration:** 2010-2011

**Collaborator:** GRM Int.

**Funding:** Environment Agency-Abu Dhabi, Ministry of Environment and Water of UAE

**Title:** Farming systems, technology transfer and capacity building. Cooperation with Farmers' Service Center (FSC), Abu Dhabi

**Duration:** 2010-2012

**Collaborators:** ADAFCA, FSC Abu Dhabi

**Funding:** ADAFCA, FSC Abu Dhabi

**Title:** Identification of vegetable and ornamental germplasm suitable for marginal environments

**Duration:** 2010-2012

**Collaborators:** AVRDC, IITA, USDA, NARS

**Funding:** ICBA core

**Title:** Adaptation to climate change in WANA marginal environments through sustainable crop and livestock diversification

**Duration:** 2010-2014

**Collaborators:** NARS in Jordan, Pakistan, Palestine, Oman, Syria, Tunisia, and UAE Funding: IFAD, AFESD, OFID, IDB

**Title:** Developing federal environmental guidelines and standards to monitor desalinated water industry in the United Arab Emirates

**Duration:** 2011-2012

**Funding:** MOEW

**Title:** Evaluation of DuPont Root Hydration System at ICBA under local conditions Duration: 2011-2012

**Collaborator:** DuPont

**Funding:** DuPont

**Title:** Selection of high yielding and stable safflower (*Carthamus tinctorius* L.), cowpea, guar and sesbania genotypes under salinity stress

**Duration:** 2011-2013

**Funding:** ICBA, IFAD, AFESD

**Title:** Optimizing management practices for maximum production of three *Atriplex* species under high salinity levels-Phase II

**Duration:** 2011-2015

**Collaborators:** UAEU, NARS of several WANA countries

**Funding:** ICBA core

**Title:** Effect of Mechanical Rejuvenation Techniques on grass recovery and productivity

**Duration:** 2011-2015

**Collaborators:** United Arab Emirates University, University of Sudan, IFAD, AFESD

**Funding:** ICBA core

**Title:** Investigation of elite date palm varieties for salt tolerance-Phase II

**Duration:** 2011-2015

**Collaborator:** MOEW

**Funding:** ICBA core

**Title:** Evaluation of *Salicornia bigelovii* and native halophytes on seawater irrigation

**Duration:** 2012-2013

**Collaborator:** Masdar

**Funding:** Masdar

**Title:** National strategy to improve plant and animal production in the United Arab Emirates

**Duration:** 2012-2013

**Collaborator:** MOEW

**Funding:** MOEW



## UZBEKISTAN

Capacity Building

2002

- Agro-ecological surveys and germplasm collection

2003

- Quality evaluation and utilization of salt tolerant forages
- Biosaline agriculture and sustainable production systems (Tashkent, Uzbekistan)

2004

- Biosaline Agriculture Principles & Applications with reference to Central Asia and Caucasus Region

2005

- Germplasm Evaluation, Multiplication and Data Collection

2006

- Advances in Biosaline Agriculture with Reference to Central Asia and Caucasus Region
- Extensive training on biosaline agriculture

2007

- Production and Utilization of Salt Tolerant Forage Crops/Halophytes

2012

- Seed production, maintenance of cultivars and integrated crop management package

Research

**Title:** Enabling Communities in the Aral Sea Basin to Combat Land and Water Resource Degradation through the Creation of 'Bright' Spots

**Duration:** 2005-2007

**Collaborators:** IWMI, ICARDA and NARES of Uzbekistan, Kazakhstan and Turkmenistan

**Funding:** Asian Development Bank

**Title:** Regeneration and dissemination of salt-tolerant germplasm

**Duration:** 2007-2013

**Collaborators:** National and international plant genetic resources programs

**Funding:** ICBA core

**Title:** Strategic dual purpose crops of underutilized plants as part of a climate change adaptation strategy

**Duration:** 2010-2012

**Collaborators:** ICARDA-CAC, ICBA-CAC, NARS Uzbekistan

**Funding:** ICBA core

**Title:** Sorghum and Pearl Millet for Crop Diversification Improved Crop-Livestock Productivity and Farmers Livelihood in Central Asia

**Duration:** 2011-2014

**Collaborators:** ICARDA, ICRISAT, Uzbekistan, Kazakhstan, Tajikistan

**Funding:** IDB and ICBA core

**Title:** Utilization of low quality water for halophytic forage and renewable energy production (PEER)

**Duration:** 2012-2014

**Collaborators:** Nevada University, National University of Uzbekistan, Academy of Science of Uzbekistan, KRASS, and NIGMI

**Funding:** USAID

## YEMEN

MOU

- Agricultural Research and Extension Authority, 2014
- Ministry of Water and Environment, 2014
- University of Sana'a, 2014

Capacity Building

2002

- Design and management of irrigation systems for biosaline agriculture

2003

- Salinization of irrigated lands and reclamation

2006

- AOAD training on “Train the trainers on water awareness in the Arabian Peninsula”

2010

- Biosaline Agriculture Technologies and its Role in the Mitigation of Climate Change in the Arab Region

2011

- Techniques for the use of treated wastewater in agricultural production and its role in food security in the Arab world

2012

- Environmental impact assessment and soil and irrigation management associated with the use of marginal water in agricultural production
- Farmers' schools for forage production and utilization techniques under the use of marginal water resources

2013

- Guidelines and methods for socioeconomic assessment and farm surveys
- Travelling Training Workshop: Variety selection, seed production, soil and crop management practices and on-farm efficient forage utilization

Research

**Title:** Sorghum and pearl millet for enhanced crop-livestock productivity in saline lands

**Duration:** 2008-2012

**Collaborators:** Egypt, Jordan, Oman, Syria, Yemen

**Funding:** OFID, IFAD, AFESD and ICBA core

## ABOUT ICBA

ICBA – The International Center for Biosaline Agriculture is a non-profit, autonomous international agricultural research center with headquarters in Dubai, UAE. ICBA conducts research and development programs that aim to improve agricultural productivity and sustainability in marginal environments.

The Center was established in 1999 through the visionary leadership of the Islamic Development Bank, the Organization of Petroleum Exporting Countries (OPEC) Fund, the Arab Fund for Economic and Social Development and the Government of United Arab Emirates. The host country, through the Ministry of Water and Environment and the Environment Agency–Abu Dhabi extended the agreement with IDB in 2010 and increased their financial support to the Center.

Over the last 13 years, ICBA has evolved into a world-class modern research facility with a team of international scientists conducting applied research to improve the well-being of poor farmers in marginal environments.

In 2013, the Center developed a new strategic direction addressing the closely linked challenges of income, water, nutrition, and food security.

**Our Mission: to work in partnership to deliver agricultural and water scarcity solutions in marginal environments**

ICBA's multi-pronged approach to address the closely linked challenges of water, environment, income and food security include research innovations in the 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 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.

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