Adaptation to Climate Change in the Water Sector in the MENA Region (ACCWaM)

Abdullah Droubi & Gerhard Lichtenthäler

Expert Group Meeting on Regional Cooperation for Climate Change Impact Assessment on Water Resources in the Arab Region

5-6 July 2012, UN House – Beirut, Lebanon
Overview

1. ACCWaM – Project Outline
2. Fields of Intervention
3. Result Model
4. Cooperation with Partners
   • AMWC (LAS)
   • ACSAD
   • ESCWA
5. Adaptation Innovations
   • Egypt
   • Jordan
   • Lebanon
1. ACCWaM – Project Outline

Objective

- Improve the capacities of regional and national water sector institutions to develop and implement strategies for adaptation to climate change

Partners

- Arab Ministerial Water Council (AMWC) of the League of Arab States, Dept. Environment, Housing and Sustainable Development
- Arab Center for the Study of Arid Zones and Dry Areas (ACSAD)
- UN Economic and Social Commission for Western Asia (ESCWA)

Duration: 2011 – 2017 (2 phases of 3 years each)
### Policy and Strategy

1. **Action Plan for the regional strategy on water security**
2. **Mainstreaming CCA in national water plans**
3. **Climate proofing for water investments**
4. **Access to finance for CCA**
5. **Regional representation in international/global dialog**
6. **Regional consultation on policy relevant CCA topics**

### Institutional Framework

1. **Fostering conducive institutional frame conditions in IWRM for CCA**
   - Decentralized services
   - Subsidiary decision making
   - Multi-sectoral approach
   - Multi-stakeholder participation

### Tools and Methodology

1. **Downscaling of regional climate predictions**
2. **Impact assessment on water resources**
3. **Assessment on socio-economic vulnerability**
4. **Decision support system (DSS)**
5. **Climate proofing for water investments**

### Technologies/Resource Management Systems

1. **Adaptation innovation Egypt**
2. **Adaptation innovation Lebanon (ground water recharge)**
3. **Adaptation innovation Jordan (integrated watershed management)**

---

**Expert Group Meeting on Regional Cooperation for Climate Change, 5-6 July 2012, Beirut, Lebanon**
gIZ 3. Result Model

Development Objective
The capacities of regional and national water sector institutions to develop and implement strategies for adaptation to climate change are improved.

LAS/AMWC
- The AMWC addresses the challenges of climate change in the water sector on national level.
- The AMWC is aware of international climate funds.
- The Regional Water Strategy and its Action Plan give orientation on relevant aspects for CCA on national and regional level.
- The Action Plan is based on the AMWC's decision-making structure.
- The Action Plan is developed in cooperation with the Ministry of Water and Agriculture.
- The Action Plan is reviewed and amended according to international standards.
- The Action Plan is implemented in accordance with the AMWC's decision-making structure.
- The Action Plan is implemented in cooperation with the Ministry of Water and Agriculture.

ACSSAD
- ACSSAD serves as a technical secretariat for the Action Plan.
- ACSSAD coordinates the preparation of the Action Plan and follows it up.
- ACSSAD provides technical support and advice on CCA in the MENA region.
- ACSSAD is a requested service provider in CCA-related water issues.
- ACSSAD is a requested service provider in CCA-related water issues.
- ACSSAD is a requested service provider in CCA-related water issues.

C1
- ESCWA offers capacity development and is a knowledge broker on CCA in the region.
- ESCWA offers capacity development and is a knowledge broker on CCA in the region.
- ESCWA offers capacity development and is a knowledge broker on CCA in the region.

National Water Ministries
- National water Ministries are considering regional climate change scenarios in their national strategies, plans and projects.
- National water Ministries are considering regional climate change scenarios in their national strategies, plans and projects.
- National water Ministries are considering regional climate change scenarios in their national strategies, plans and projects.

ACWWaM
Adaptation to Climate Change in the Water Sector in the MENA Region
Legend
ACWWaM Arab Center for the Study of Arid Zones and Dry Lands
AMWC Arab Ministerial Water Council
CCA Climate Change Adaptation
EIMR Integrated Water Resource Management
ESCWA Economic and Social Commission for Western Asia
MINA Middle East North Africa
Pm Indicator Programme (2011-2017)
Ph Indicator of Phase 1 (2011-2014)
3. Result Model

Highly-aggregated Result
The MENA region is more water-secure in the long term.

Indirect Result
Water resource management becomes more climate resilient (contribution to water security).

Development Objective
The capacities of regional and national water sector institutions to develop and implement strategies for adaptation to climate change are improved.

LAS/AMWC
The AMWC gives orientation regarding CCA in the water sector on the national level.

The AMWC addresses the challenges of climate change in the water sector on regional level.

The Regional Strategy and its Action Plan give orientation on relevant CCA aspects.

ACSA D
ACSA D is a requested service provider on CCA advice in the MENA region.

ACSA D serves as a technical secretariat for the Action Plan.

ACSA D coordinates the preparation of the Action Plan and follows up its implementation.

WATER MINISTRIES

ESCWA
ESCWA offers capacity development and is a knowledge broker on CCA in the region.

A manual on CCA is developed as a flagship document for IWRM.

A regional knowledge hub is used by water decision makers and scientists.

CCA is mainstreamed in the national water plans.

Upscaling strategies for innovation projects are developed.

Innovation projects to CCA are planned and implemented in Egypt, Jordan and Lebanon.
4. Cooperation with Partners

Arab Ministerial Water Council (AMWC)

- provide **expertise** for the preparation of the Action Plan according to the Arab Water Strategy
- **regular participation** in the technical committee meetings of the AMWC
- provide **technical support** to the AMWC (grey water reuse, Baghdad)
- support the AMWC to access **international funds**
- give **orientation** regarding climate change adaptation in the water sector at the national level and address challenges
4. Cooperation with Partners

ACSAD

- technical secretariat of the AMWC international expertise for the preparation of the Action Plan for the Arab Water Strategy
- capacity development service provision for CCA
- technical assistance manual on CCA in the agricultural sector
- innovative adaptation measures (upscaling) design, implementation and follow up of pilot projects in Egypt, Jordan and Lebanon
4. Cooperation with Partners

ESCWA

- **Methodologies and tools**
  - Vulnerability assessment
  - Assess and map the vulnerability of water resources in the MENA countries towards climate change impacts
  - Integrated mapping
  - Illustrate vulnerability **hotspots** in the Arab Region

- **Web-based regional knowledge hub**
  - To enhance access to climate change information in the Arab Region

- **Technical assistance**
  - Development and design of training tools to support preparation of IWRM manual for climate change adaptation
5. Pilot innovative projects

Jordan – Azraq Basin

Objective: Sustaining groundwater resources through a combination of artificial recharge and a shift from irrigated agriculture to solar energy farming.

Azraq basin is one of the groundwater basins that have been over-used for decades. Nowadays, and in the absence of sufficient precipitation (50 mm/year), the total abstraction is twice the natural recharge rate.

The total abstraction reaches 50.4 MCM out of which 27.9 MCM is used in irrigation. This raises the alarm to take appropriate measures to reduce abstraction and manage the little resources that remains.

Safe abstraction – 20 MCM But today ……•20 MCM go to cities •40 MCM go for agriculture •200% over-abstraction (IUCN, 2009)
Azraq basin situation

Schematic view of Azraq basin IUCN (2009)

Groundwater salinity variation in Azraq (Hadidi 2005)

Hydrological problem (IUCN 2009)

Location of Azraq oasis (IUCN 2009)

A is the Aquifer Flow
B is the wetland
C is for Agriculture use
D is for Domestic use

A = B + C + D
(sustainable use)
B + C + D > A
(actual use)
Potential:
B + C = A if C < 25% for Amman/Zarqa

Groundwater salinity variation in Azraq (Hadidi 2005)

Azraq Basin
Ahsa well No.15

Hydrological problem (IUCN 2009)
The Highland Water Forum is a stakeholder dialogue that is mandated by the Jordanian Prime Ministry with the ultimate task of elaborating an Action Plan for Sustainable Groundwater Management in the Highlands. The Highland Water Forum follows a participatory approach by involving stakeholders from the governmental sector, the local community, and the farmers in the decision-making process to identify measures to reduce groundwater over-abstraction. It aims to develop a comprehensive Action to implement projects on the ground, which finally lead to sustainable groundwater management of groundwater.

The two projects “a) Artificial Recharge Using Recharge Release Dams” and “b) Energy Farming to Save Groundwater” - subject of this proposal - are a direct result of the Highland Water Forum consultations.
**Background**; The Egyptian government has developed a national climate change adaptation strategy where the water resources sector adaptation measures were addressed. The strategy referred to the National Water Resources Plan (NWRP) and its measures related to enhancing the water use efficiency as adaptation measures that are necessary to adapt to the effect of climate change and to face the increasing water shortage because of it.

One of the most NWRP related measures is the reuse of drainage water, which will help in utilizing -to the maximum possible level the available water resources and in raising the overall efficiency of the water resources system in Egypt.

The ministry of water resources and Irrigation in Egypt is looking to save, by this approach about 4 billion m$^3$, if the concept succeed.

**Objective**; The pilot project will aim at maximizing the use of drainage water, which otherwise will be lost to the northern lakes and the sea, through the intermediate drainage water reuse. That reused water will be utilized mainly in agriculture sector, however it will also avail part of the fresh water that is currently used in agriculture to be used in other sectors (domestic, industry, etc.)
The pilot project shall be implemented in Behira and/or Kafr El-Sheikh Governorates. Those two governorates, which are located at the end of the Nile system, face severe problems in terms of both water quantity and quality. The project will be implemented using participatory approach (working very closely with local water association) and trying to make it sustainable through the use of renewable energy. The local communities will be trained to manage the project. The main components of the project will be technical, economic and social.
Lebanon
Preventing seawater intrusion through artificial recharge of coastal aquifer

The selected area is located between Beirut and Byblos where sea water intrusion, due to over pumping in the coastal aquifer has led to a deterioration of the groundwater quality. The project is looking to conduct a feasibility study to explore the possibility of recharging the groundwater aquifer by using surplus of surface water resulting from snow melting in spring time.
Thank You