

Egypt – Omayed Biosphere Reserve

Project title: Omayed Biosphere Reserve and its surrounding neighbourhood

Partner institution: University of Alexandria, National Committee for the UNESCO-MAB Programme

Contact details of team leader:

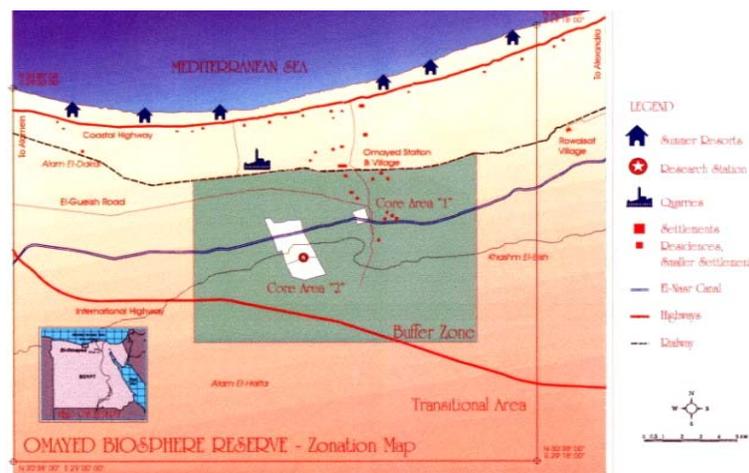
Prof. Boshra B. Salem
Chair, Department of Environmental Sciences
Faculty of Science
University of Alexandria
21511 Moharram Bey
Alexandria
Egypt
Tel: (002 01) 01449645
Fax: (002 03) 3911794
E-mail: boshra.salem@dr.com

Deputy:

Introduction

Omayed region lies at the western coastal desert of Egypt, and is located at about 80 km to the west of Alexandria and 200 km to the east of Matruh. Covering a total area of 75,800 ha and ranging from 0 to 110, the site was designated as a biosphere reserve in 1981 and extended in 1998.

Omayed Biosphere Reserve (OBR) area represents a variety of habitats, biological communities, land use patterns and human settlements of the Mediterranean coastal desert of Egypt. The OBR comprises four villages with a total number of about 400 human beings.



Location of the Omayed BR (OBR) and its structure

There are five main habitat types at OBR: coastal dunes, inland ridges, saline depressions, non-saline depressions, and an inland plateau. The area is located in a warm desert and semi-desert ecosystem with coastal calcareous dunes consisting of *Ammophila arenaria*, *Euphorbia paralias*, *Pancreatium maritimum* etc.; inland ridges with skeletal shallow soils characterized by either *Thymellaea spp.* and *Gymnocarpus decadrum* communities or by associations of *Plantago albicans* and *Asphodelus microcarpa*; saline marshy depressions dominated by *Salicornia fruticosa*, *Cressa cretica*, *Atriplex halimus* etc.; non-saline depressions and inland plateau including species such as *Artemisia monosperma* and *Hammada elegans* associations (calcareous soils), *Anabasis articulata* and *Hammada scorpioides* (shallow degraded soils) and *Suaeda pruinosa* and *Salsola tetrandra* communities (saline soils); pasture land, fig plantations; agroecosystems.

Environmental constraints comprise land degradation, habitat fragmentation, overgrazing, loss of biodiversity, salinization of soil, and over exploitation of mineral and water (ground water) resources. The area is undergoing a serious transformation process from natural rangelands to agricultural lands, particularly after the extension of an irrigation canal and an extended irrigation networks from the Nile. The availability of irrigation water has influenced the whole lifestyle of the local community and has created conflicts in land tenure due to the increase in land prices. The profile of land tenure comprise the heritage from the local community ancestors, where each tribe, and according to the local Bedouin law (*Urf*), knows its property of land in terms of location and size, and have full control over it. Investors who are newcomers and who want to buy land for cultivation purposes, have to buy the land from the owner of the local community first, then pay taxes per square meter according to the government law. The availability of irrigation water has created the interest and attraction of many investors to the area, and constitutes a new type of stakeholder.

According to the previous study during the first phase of SUMAMAD, the previous economic constraints were:

- Absence of permanent source of income (revenue);
- Lack of skills;
- Major activities are seasonal (agriculture and grazing);
- Spread of unemployment and thus poverty.

This has now changed to:

- Continuous source of income, but to those who own large parcels of land;
- Development of skills, particularly in new irrigation practices;
- Agriculture is all year round, however grazing is still seasonal;
- Unemployment is still a constraint in the poor sector of the local community.

Accordingly, stakeholders in OBR can be identified as follows:

1. Local community: members from the poor sector (mainly rangers), and rich local community members (land owners);
2. New rural community from the new comers (farmers);
3. Investors in the agriculture sector and tourism sector;
4. Governmental agencies: Local Council, Governorate of Matruh, State ministries of environment, agriculture, reclamation and water resources;
5. Military sector: frontier army, ministry of defence;

6. Educational institutions (universities, and research centers).

The previous phase of SUMAMAD has identified the environmental constraint as loss of biodiversity, habitat fragmentation, and land degradation. With regard to water, there is an over pumping process going on, which affects the quality and quantity of ground water, due to lack of natural discharge. The current land transformation taking place in OBR, is greatly affecting the physical and biological properties of habitats, and is putting an increasing pressure on the fragile dry soils. This situation will lead to increased desertification rates, depletion of resources, soil erosion and loss of productivity. The situation will be exacerbated with the expected droughts and water stresses, and limited productivity due to climate change impacts. In this context, it is important to assess the nature and scale of climatic changes impacts.

Justification

The previous situation of land transformation and change of livelihoods in OBR has greatly influenced the lifestyle of the community, increased conflicts, and has also immense impacts on the natural resources of the area and its natural habitats. The situation calls for urgent assessments procedures, valuation and management intervention towards sustainability, particularly with the advent of the expected droughts, water stresses due to climate change, and the encroachment of desertification.

Changes in land cover and land use on the one hand drive climate change, and on the other hand are directly or indirectly affected by climate change. Conversion of rangelands into agricultural land, for example, drives climate change. It leads to alteration of surface properties of an ecosystem (e.g. albedo, roughness length) and changes the efficiency of ecosystem exchange of water, energy and CO₂ with the atmosphere. It is expected that the land use shift to agricultural land will continue in the future. It is therefore important to assess factors which are thought to have a direct influence on the social and biophysical vulnerability of traditional and indigenous communities to global climate change.

Achievements / lessons learned from 1st Phase of SUMAMAD

Through the SUMAMAD project, the Egyptian team was able to achieve the following:

1. Creation of a complete Geodatabase of OBR based on participatory GIS approach. Through this database rational management practices could be identified and allocated for the benefit of the local community.
2. Completion of an ecological study of the natural resources of Moghra Oasis (for the first time) at the hinterland of OBR. This study will allow its nomination as an extension of the OBR.
3. Fresh drinking water was provided to a small community in OBR. This community represents one of the poorest families which has no access to fresh drinking water.
4. Limited access to credit to allow income generating activities for women was made possible, so that women now can afford their living expenses through sewing.
5. The issuing of identity cards to at least 150 women of the Bedouin community was made possible, so that these woman now enjoy their rights in heritage, legal marriages, health and other services provided by the local government.

6. The formation of an NGO of graduates students in environmental sciences that joined the SUMAMAD team and volunteered in awareness-raising workshops held for the local community.
7. Successful fund raising by the NGO to carry out more environmental work at the SUMAMAD site to provide fresh drinking water to the local community after presenting SUMAMAD as a show case.
8. Training in remote sensing for a Ph.D. student who is a member of the SUMAMAD team, and an M.Sc. scholarship in drylands awarded to another member of SUMAMAD team.

Specific objectives, expected outputs and activities of the project:

a. Preparedness of the local community to combat expected climate change. This objective involves the following activities:

- Assessment of the nature and scale of climate change impacts;
- Assessing social and biophysical vulnerability of the local community to climate change;
- Soil carbon sequestration using composting;
- Rehabilitation of degraded ecosystems by propagation of endangered species;
- Provision of fresh drinking water by continuation of installation of solar water desalination systems on the roof of the houses;
- Use of solar heaters and cookers as a replacement of fuel wood cutting.

b. Construction of a recent land use/cover map of land transformed areas, using a recent satellite image. This objective involves the following activities:

- Interpretation of a high resolution satellites image of transformed habitats;
- Assess the impacts and value of transformed habitats.

c. Strategic assessment of development projects. This objective involve the following activities:

- Examination of the developed scenarios from the first SUMAMAD phase;
- Development of a management plan towards the rational development of the multi-social, multi-use and multi-targeted areas including Moghra oasis (Omayed Hinterland).

d. Capacity building activities. These activities involve:

- Workshops for local council personnel and biosphere reserve management team on governance mechanisms in terms of general consensus, public participation, and conflict resolution.
- Training of young scientist from the SUMAMAD team – pending the availability of study grants.

e. Development of income-generating activities. This activity involves:

- Examination of needs assessments of the poor local community;
- Continuation of provision of sewing machines for women to provide alternative income opportunities which reduce the impacts on natural systems;
- Production of jam and dried fruits from fig plants and marketing of the fruits.

The 5 major proposed objectives will be distributed over the five years as follows:

Objective/activity	Y1	Y2	Y3	Y4	Y5
A. Preparedness of the local community to combat expected climatic changes. This objective involves the following activities:					
- Assessment of the nature and scale of climate change impacts		—	—	—	—
- Assessing social and biophysical vulnerability of local community to climate change	—	—			
- Soil carbon sequestration using composting	—	—	—		
- Rehabilitation of degraded ecosystems by propagation of endangered species		—	—		
- Provision of fresh drinking water by continuation of installation of solar water desalination systems on the roof of houses		—	—	—	—
- Use of solar heaters and cookers as a replacement of fuel wood cutting		—	—	—	—
B. Contraction of a recent land use/cover map of land transformed areas, using a recent satellite image. This objective involves the following activities:					
- Interpretation of a high resolution satellites image of transformed habitats	—	—			
- Assess the impacts and value of transformed habitats		—	—	—	
C. Strategic assessment of development projects. This objective involve the following activities:					
- Examination the developed scenarios from the first SUMAMAD phase as compared to local policy assessments	—	—			
- Development of a management plan towards rational development of the multi-social, multi-use and multi-targeted areas		—	—	—	—
D. Capacity building activities. This activity					

involves:					
- National workshops for local council personnel and biosphere reserve management team on governance mechanisms in terms of general consensus, public participation, and conflict resolution.	—				
- Training of young scientist form the SUMAMAD team - available grants	—				
E. Development of income-generating activities. This activity involves:					
- Examination of needs assessments of the poor local community	—	—			
- Continuation of provision of sewing machines for women	—		—		
- Production of jam and dried fruits form fig plants and marketing of the fruits				—	—

Plan of the first year:

Objective/Activity	Y1	Budget (US\$)
B. Preparedness of the local community to combat expected climatic changes. This objective involve the following activities:		
- Assessment of the nature and scale of climate change impacts		2,000
- Assessing social and biophysical vulnerability of local community to climate change	—	2,000
- Soil carbon sequestration using composting	—	3,000
- Rehabilitation of degraded ecosystems by propagation of endangered species		
- Provision of fresh drinking water by continuation of installation of solar water desalination systems on the roof of houses	—	3,000 + (additional funds form the NGO)
- Use of solar heaters and cookers as a replacement of fuel wood cutting (pilot scheme)		2,000

B. Contraction of a recent land use/cover map of land transformed areas, using a recent satellite image. This objective involves the following activities:		
- Interpretation of a high resolution satellites image of transformed habitats	—	3,000
- Assess the impacts and value of transformed habitats		2,000
C. Strategic assessment of development projects. This objective involves the following activities:		
- Examination the developed scenarios from the first SUMAMAD phase as compared to local policy assessments	—	3,000
- Development a management plan towards rational development of the multi social, multi-use and multi targeted areas		
D. Capacity building activities. This activity involves:		
- National workshops for local council personnel and the biosphere reserve management team on governance mechanisms in terms of general consensus, public participation, and conflict resolution.		2,000
- Training of young scientist form the SUMAMAD team - available grants	—	Grants
E. Development of income-generating activities. This activity involve		
- Examination of needs of the poor local community	—	1,000
- Continuation of provision of sewing machines for women		2,000
- Production of jam and dried fruits form fig plants and marketing of the fruits		
Total		25,000

Financial contributions from other sources

SUMAMAD Phase-2 will involve collaboration with the “Ecosystem and Human Development Association (EHDA)”, which originated during the last year of SUMAMAD Phase-1. This NGO

has used the results of SUMAMAD-1 as a show case to obtain a grant for the provision of fresh drinking water to local community by using the solar units developed in SUMAMAD-1, and also to rehabilitate more Roman cisterns in OBR.

EHDA will also adopt the *Teaching Resource Kit for Dryland Countries* developed by UNESCO, and start a pilot workshop using such material to train university undergraduates and school students in the field.

The Egyptian National Committee for the UNESCO-MAB Programme will also be involved with in-kind contributions, mainly for administrative tasks. The financial contribution from EHDA and the National MAB Committee will be as follows:

Activity	Units	Contribution in US\$	Source
Installation of solar systems for the provision of fresh drinking water to three local communities	20 units	20,000	EHDA
Rehabilitation of Roman cisterns	3	6,000	EHDA
Environmental Education using the UNESCO drylands kit	One workshop	2,000	EHDA
In-kind contribution	Office use, and some field equipment	5,000	EHDA and MAB National Committee
Total		33,000	

Counterpart contribution per year (in US Dollars):

	2009	2010	2011	2012	2013	Total
SUMAMAD Member State (EHDA)	15,000	8,000	3,000	2,000	--	28,000
MAB National Committee	1,000	1,000	1,000	1,000	1,000	5,000
Total						33,000

Expected outputs

- a. Assessment of the social and biophysical vulnerability of the local community to climate change and proposed plans to be taken accordingly;
- b. A community aware of various adaptation mechanisms to climate change impacts;
- c. Recognize indigenous and traditional peoples' own coping strategies to adapt to adverse conditions of climate change and desertification;
- d. An improved water use efficiency and water retention capacity in soils through the application of compost;

- e. Reduction of the vulnerability of drylands people to climate change by reversing their marginalization and to provide them with adequate services and support;
- f. A rational management plan according to the examined scenarios of development projects and their impacts;
- g. Trained young scientists on dryland management techniques;
- h. Trained local council personnel on rational governance from environmental and social aspects;
- i. Rehabilitation of degraded ecosystem and means for reversing degradation;
- j. Self sustained community using solar energy for supply of safe drinking water, cooking and heating as an alternative to fuel wood;
- a. An improved livelihood through the development of income generating activities.

Capacity Building priorities:

1. Training on "Aqua crop Model", water deficit irrigation system.
2. Training in techniques related to environmental economics.
3. Training on soil management practices.

Research team composition

Staffing	Position	Contribution
<i>Scientific Staff</i>		
Prof. Boshra Bakr Salem Chair, Department of Environmental Sciences, Faculty of Science, University of Alexandria	National Coordinator	Overall management
Miss Marwa Wasseem Abdel Wahab Assisitant lecturer, Department of Environmental Sciences, Faculty of Science, University of Alexandria	Deputy	Biophysical assessment
Dr. Mohamed Rashad Associate Professor, Mubarak City of Science and Technology	Member	Soil and water assessments
Ms. Caroline King Ph.D. student Oxford University - UK	Member	Review and editing of reports
Dr. Mohammed Awad Lecturer, Department of Environmental Sciences, Faculty of Science, University of Alexandria	Member	Socio- economic assessments and valuation
Miss Marwa Gaber Graduate, Department of Environmental Sciences, Faculty of Science. M.Sc Student, UNU M.Sc drylands grant	Member	Valuation assessments
NGO members (Ecosystems and Human Development Association)	Members	Assistances

<i>Administrative staff</i>		
Mrs. Mona Allam Assistant, Secretary, National MAB Committee	Member	Administration supervision
Mr. Mohamed Eissawy Manager, Omayed Biosphere Reserve	member	Local policy analysis of OBR