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**TOWARDS MAINSTREAMING LAKE BURULLUS
BIODIVERSITY, NORTH EGYPT
[A REVIEW ARTICLE]**

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ABSTRACT:

Lake Burullus is situated in a middle locus between the two branches of the Nile that form the Delta. It is one of a network of Protected Areas throughout Egypt, designated and managed by the Egyptian Environmental Affairs Agency. It is registered as a Ramsar site and the BirdLife International has identified it as an Important Bird Area (IBA). Recent surveys showed rich biodiversity of planktons, higher plants and fauna; including numbers of rare, endemic and threatened species. Fisheries provide the principal life-support system for the inhabitants. Other resource uses include: agriculture, livestock farming, fish farming, reed harvesting, bird hunting, tourism and recreation. This Lake and its surroundings are subjected to ecological and administrative constraints that lead to threaten its biodiversity and to excessive use of resources. To mitigate the impacts of these constraints for conserving its biodiversity, a management plan of five major programs that respond to five principal objectives was suggested: 1-restore ecological and landscape values, 2-maintain and enhance the ecological and landscape values, 3- conserve resources through sustainable management, 4-improve socio-economic opportunities for local people and 5- develop public awareness for nature conservation; projects have been devised for each of these headings. Eight governmental institutions are involved in the management plan: 1-Kafr El-Sheikh Governorate, 2-Nature Conservation Sector, 3-General Authority for the Development of Fisheries Resources, 4-Ministry of Irrigation and Water Resources, 5-Coast Guard, 6-Water and Environment Police, 7-Ministry of Housing and New Communities and 8-Directorate of Public Health. A number of non-governmental associations (NGOs) also play a key role affecting land and resource use in the area. An Advisory Committee comprising all relevant stakeholders, including representatives of relevant ministries, NGOs, local communities and fishermen associations, was designated. The role of this committee should be re-formulated from being merely consultative to the more effective function of decision-making. A further Executive Committee headed by the Manager of the Protectorate will assist the Advisory Committee.

INTRODUCTION:

The term "mainstreaming" is used in a variety of ways, but within broad environment-

development circles "mainstreaming biodiversity" has come to have a particular meaning. Consensus on a precise definition of the concept has proven elusive, but participants at the September 2004 Global Environment facility (GEF) workshop on biodiversity held in Cape Town, South Africa, agreed that the objective of mainstreaming biodiversity is: to internalize the goals of biodiversity conservation and the sustainable use of biological resources into economic sectors and development models, policies and programs, and therefore all human behavior (Petersen and Huntley 2005). Although mainstreaming initiatives may be generated by conservation agencies, increasingly often they originate within economic sectors, and typically involve a broad range of actors, with partnerships between non-governmental organizations (NGOs), government, industry, small, medium, and micro enterprises, and communities.

The ecosystem approach is highly compatible with mainstreaming biodiversity because of its emphasis on social and economic concerns, and on integrated and holistic decision making. A tension may sometimes exist, however, between the principle of the ecosystem approach that conservation of ecosystem structure and functioning should be a priority target, and the need for real-world compromises and trade-offs in some mainstreaming interventions (Petersen and Huntley 2005).

Situations where mainstreaming of biodiversity has occurred might be characterized by: 1-The incorporation of biodiversity considerations into policies governing sectorial activities; 2-The

simultaneous achievement of gains in biodiversity and gains in an economic sector (the "win-win" scenario); 3-Sectorial activity being recognized as based on, or dependent on, the sustainable use of biodiversity; and 4-Situations where sectorial activities result in overall gains for biodiversity exceeding biodiversity losses (Sandwith 2002). Policymakers have to consider the long-term costs of conserving biodiversity in certain contexts, and develop scenarios and plans in which the additional costs can be internalized. Successful outcomes will take many forms and will always necessitate come-promises and trade-offs.

Biodiversity conservation, sustainable use and equitable sharing call for social change. Education and public awareness are long-term investments towards this change. At the same time, biodiversity issues need to be communicated effectively to ensure the participation of major stakeholders from different sectors in the short, medium and long term. To stimulate the development of biodiversity agendas across sectors, those who are primarily responsible for biodiversity (e.g. Ministry of Environment) have to reach out and involve other ministries and sectors in society (Hesselink and van Boven 2002).

Assessments of impacts of human activities in Lake Burullus (shallow, brackish, Mediterranean coastal lagoon with an area of 410 km²), and the vast territories that form its catchment area in north Egypt, provide decision makers with bases for sound decisions and fair judgments. The wealth of information about this Lake makes a rich source for

environmental education at all levels (Shaltout and Khalil 2005). The available data on its biodiversity make a useful tool in the hands of rangers and technicians working in the survey and monitoring programs in Lake Burullus. The present paper introduces the Egyptian efforts towards mainstreaming biodiversity of Lake Burullus at North Egypt. Such efforts had been done through the "Project for the Conservation of Wetland and Coastal Ecosystems in the Mediterranean Region" (MedWetCoast Project) sponsored by UNDP and GEF and implemented by the Egyptian Environmental Affairs Agency (EEAA), through its Nature Conservation Sector (NCS) and National Biodiversity Unit (NBU).

SITE CHARACTERISTICS:

Lake Burullus is situated in a middle locus between the two branches of the Nile that form the Delta, it is a centre-piece of five lakes: Bardawil in Sinai, Manzala in the eastern Delta, Burullus, Idku in west and Mariut further west (Fig. 1). The chain of the five lakes stud about 500 km coastal front crossed by flyways of migratory birds in their seasonal journeys between the Euro-Asian Palearctics and the African Tropics, all are wetlands of international importance. It is one of a network of Protected Areas throughout Egypt, designated and managed by the Egyptian Environmental Affairs Agency (EEAA). It is registered as a Ramsar site and the BirdLife International has identified it as an Important Bird Area (IBA). It is a shallow, brackish, Mediterranean coastal lagoon with an area of

410 km²; a maximum length of 47 km and a maximum width of 14 km (Table 1); and its depth varies between 40 and 200 cm (El-Bayomi 1999). Recent surveys carried out in this Lake provide information on its ecological features including geomorphology, hydrology, water and bottom sediments, and climatology. They also describe the various taxonomic groups of living organisms and their habitat types, and provide the socio-economic set-up in the area and the intimate relationships between the society and the biological and ecological features (Shaltout and Khalil 2005). Surveys showed rich biodiversity of planktons, higher plants and fauna including birds (it is a wintering area of international importance for waterbirds). Biodiversity includes numbers of rare, endemic and threatened species. This work provides bases for ecologically sound management of the Lake that ensures balance between needs of conservation of biodiversity and sustainable use of the life-support systems of natural resources of the Lake.

Table 1. Morphometric dimensions of Lake Burullus (El-Bayomi 1999)

Character	1984	1996	Reduction (%)
Area (km ²)	502.7	410.0	18.4
Circumference (km)	160.0	143.0	10.6
Maximum length (km)	56.0	47.0	16.1
Maximum width (km)	15.0	14.0	6.7
Length/width ratio	3.7	3.3	10.8

Fisheries provide the principal life-support system for the local inhabitants: production approximates 51000 ton year⁻¹. 17000 licensed

fishermen and their families depend on these resources for their living. Other resource uses include: agriculture, livestock farming, fish farming (about 155000 ton year⁻¹), reed

harvesting, bird hunting, tourism and recreation (see Shaltout and Khalil 2005).

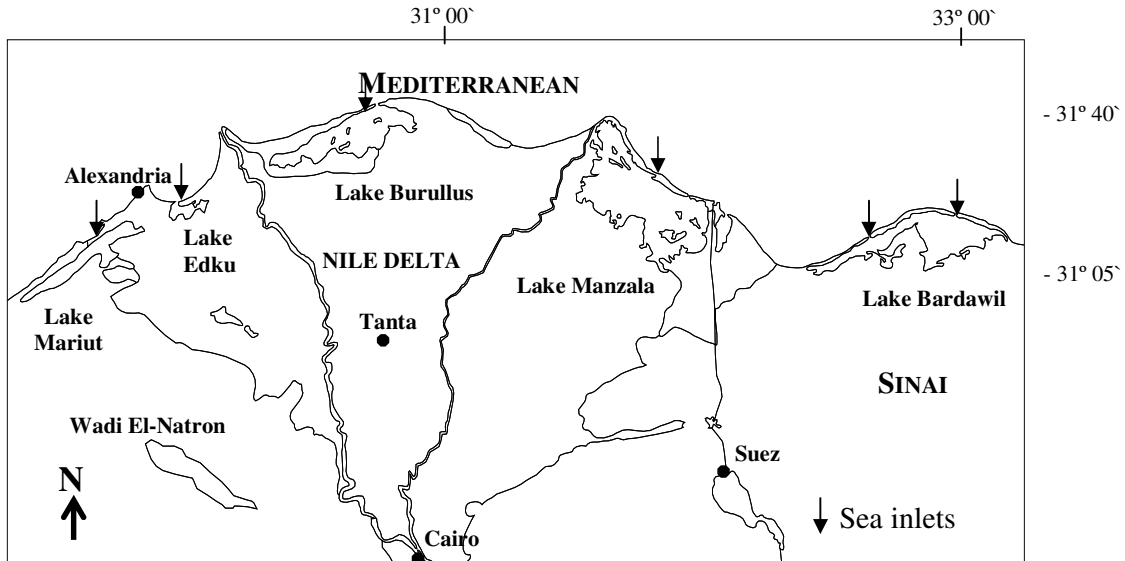


Figure 1 : Location map of the five northern lakes of Egypt

BIODIVERSITY:

Based on ecosystem approach, the biodiversity in Lake Burullus is classified into three major trophic groups: producers, consumers and saprotrophs. The producers are classified into vascular plants, phytoplankton and epiphytic algae (Table 2). The consumers are classified into three trophic levels: primary consumers (i.e. herbivores), secondary consumers (i.e. primary

carnivores) and tertiary consumers (secondary carnivores). Zooplankton and zoobenthos are mainly primary consumers, but the other animal groups (terrestrial invertebrates, fishes, reptiles, amphibians, birds and mammals) have members that belong to the three levels of consumers (Shaltout and Khalil 2005). The saprotrophs are mainly the bacteria and fungi of decay.

Table 2: Biodiversity known from the Wetland of Lake Burullus, Egypt (after Shaltout and Khalil 2005)

Biotic Group	All species	Endemic species	Rare species	Endangered species
Vascular plants	197	3	33	-
Phytoplankton & epiphytic algae	276	-	-	-
Zooplankton	90	-	-	-
Macrobenthos	48	-	17	-

Arachnida	23	-	-	-
Insecta	94	-	-	-
Fishes	25	-	-	-
Herpetofauna	23	1	4	2
Birds	112	6	5	2
Mammals	18	1	1	-

1-Producers:

Some 197 species of vascular plants have been recorded from Burullus Wetland (100 annuals and 97 perennials) including 11 hydrophytes (the most common is the submerged macrophyte *Potamogeton pectinatus*) and one fern (*Azolla filiculoides*). The most common species is the common reed *Phragmites australis* (Shaltout and Al-Sodany 2000). Phytoplankton includes 226 algal species: 125 Bacillariophytes (Diatoms), 56 Chlorophytes, 39 Cyanophytes, 2 Euglenophytes, 2 Dinophytes, one Cryptophyte and one Rhodophyte. The common submerging *Potamogeton pectinatus* is a host for some 45 epiphytic algal species; most of them are limnetic forms and can survive in both planktonic and attached situations (Samaan *et al.* 1988).

2-Consumers:

Zooplankton community in Lake Burullus includes 90 species: 26 species of Copepoda, 7 of Cladocera, 26 of Rotifera and 10 of Protozoa; they constitute collectively about 85% of the total zooplankton (Aboel Ezz 1995). The study of terrestrial invertebrates in Burullus Wetland is still at a preliminary stage. Specimens of 23 species representing 4 orders of spiders, scorpions and their allies have been collected (El-Hennawy 2000). In addition, 94 insect species were recorded so far in this region,

however it is believed that this number will be increased following thorough future investigations (Metwally 2000).

Twenty five fish species are known from Lake Burullus, 15 of which live in fresh or brackish water, 4 species are of purely marine origin which invade the lake for some time, while 6 species belong to the obligatory migrants which spend their adult life in the brackish water of the lake and migrate to the sea for spawning (Khalil and El-Dawy 2002). On the other hand, there are 23 species of reptiles and amphibians (Herpetofauna). The recently described Nile Valley Toad *Bufo kassasii* is endemic to Egypt with localized distribution in Nile Valley, but it is found in dense populations in suitable freshwater swamps along the southern margins of Lake Burullus (Anonymous 2002). In addition, some 15 mammal species have been recorded, only one (Flower's shrew, *Crocidura floweri*) is rare and endemic to Egypt. According to the status categories set out by International Union for Conservation of Nature (IUCN), two species (*Canis aureus* and *Felis chaus nilotica*) are considered vulnerable (Basuony 2000).

One hundred and twelve species of birds were recorded in Burullus Wetland. Burullus is home to six bird subspecies endemic to Egypt, none is considered threatened: Little Green Bee-eater *Merops orientalis cleopatra*, Laughing

Dove *Streptopelia senegalensis aegyptiaca*, Senegal Coucal *Centropus senegalensis aegyptius*, Egyptian Swallow *Hirunda rustica savignii*, Crested Lark *Galerida cristata nigricans* and Egyptian Yellow Wagtail *Motacilla flava pygmaea*. According to Goodman *et al.* (1989), five rare species and subspecies occur: Montagu's Harrier *Circus pygargus*, Cuckoo *Cuculus canorus canorus*, Bar-tailed Godwit *Limosa lapponica lapponica*, Pied Avocet *Recurvirostra avosetta* and Jack Snipe *Lymnocyptes minimus*. Two of the bird species occurring in this wetland are globally threatened: Lesser Kestrel *Falco naumanni naumanni* and Ferruginous Duck *Aythya nyroca* (Tharwat and Hamied 2000).

3-Saprotrophs:

Aquatic bacteria and fungi are distributed throughout the rivers, ponds and lakes, but they are especially abundant in the mud-water interface along the bottom where bodies of plants and animals accumulate (Odum 1971). The available data on both biotic groups in Lake Burullus are too limited; only 3 papers were recently published in 2002 and 2004. The first paper deals with the zoosporic fungi recovered from 3 northern lakes (Edku, Burullus and Manzala) and lake Qaron (Mahmoud and Abou Zeid 2002). The second one was published by El-Hissy *et al.* (2004) on the diversity of zoosporic fungi recovered from the surface water of four lakes including Burullus and Manzala in the north, Qaron in the Mid and Nasser in the south. The third deals

with the distribution of some actinomycetes groups in Lake Burullus (Abou-Elela *et al.* 2004). No doubt that this gap of information should be filled taking into account the important biological role of the saprotrophic organisms in the dynamics of aquatic ecosystems.

CONSTRAINTS:

To deal with constraints upon biological diversity, the causes of negative pressures on the ecosystem and their services have to be addressed. Because of this complex dependency on other processes, the conservation of biological diversity has to be mainstreamed, or incorporated into the work of all sectors, rather than being treated as a separate agenda. Lake Burullus and its surroundings are subjected to many ecological constraints that relate to threaten its biodiversity and to excessive use of resources such as: land reclamation, fish farming, over-fishing, over-hunting, and overwhelming flow of drainage water. Likely, future constraints relate to impacts of new development projects including: the international highway that runs along the sand bar, fishing port to the west of the sea inlet and future sea-side resorts. To this may be added the likely impacts of future climate change including sea-level rise. Also, conflicting legislation, insufficient penal codes, understaffed law enforcement, illiteracy of local inhabitants, over-population and local traditions are among the constraints which can severely affect the biodiversity and resources of the Lake.

MANAGEMENT PLAN:

Wetlands are dynamic areas, open to influence from natural and human factors. In order to maintain their biological diversity and productivity and to allow wise use of their resources by human beings, some kind of overall agreement is needed between the various owners, occupiers and interested parties. The management planning process provides this overall agreement. The guidelines reported by Ramsar Convention Bureau (2000) for the structure of management plan for the wetlands comprise a Preamble followed by three major sections: Description, Evaluation & Objectives, and Action Plan (Fig. 2). Preamble is a concise policy statement which reflects in broad terms the policies of supranational, national or local authorities, or other organizations (e.g. non-governmental conservation bodies or private owners) concerned with the production and implementation of the management plan. The Preamble should also recall the broad Ramsar obligations: maintaining the ecological character of listed sites, making wise use of all wetlands, and establishing nature reserves at wetlands, whether or not they are included in the Ramsar List. Review of the plan may lead to revision of the site description and objectives (particularly the operational objectives).

To mitigate the impacts of the constraints upon the biodiversity of Lake Burullus, a team of experts of multidisciplinary experiences prepared a management plan (Kassas *et al.* 2002) following the guidelines reported by

Ramsar Convention Bureau (2000). This plan comprises 5 major programs that respond to five long-term objectives.

1-Restoring Ecological and Landscape Values:

Many studies have demonstrated that the condition of Lake Burullus deteriorated alarmingly in the recent years. The major overriding factor is the use of the lake as a discharge area for agricultural drainage water. This has had a severe effect on water balance, water quality, water condition, biodiversity and income generation for people reliant on the lake. In order to restore these deteriorated values, the following operational objectives are suggested:

- 1-Restoring salinity level.
- 2-Initiating a network for monitoring water quantity and quality.
- 3-Treating water for reuse.
- 4-Monitoring climate change.

2-Maintaining and Enhancing the Ecological Values:

This objective relies heavily on the first one. Unless a return is made to a system which replicates the previous natural hydrological system, maintenance of current values can not be achieved and management measures would, at best, slow down the rate of deterioration already occurring. The following operational activities are suggested:

- 1-Propose a zoning scheme.
- 2-Take *in situ* measures of species conservation.
- 3-Initiate *ex situ* conservation measures.
- 4-Establish a system of data management.

5-Monitor species diversity.

6-Initiate a research program.

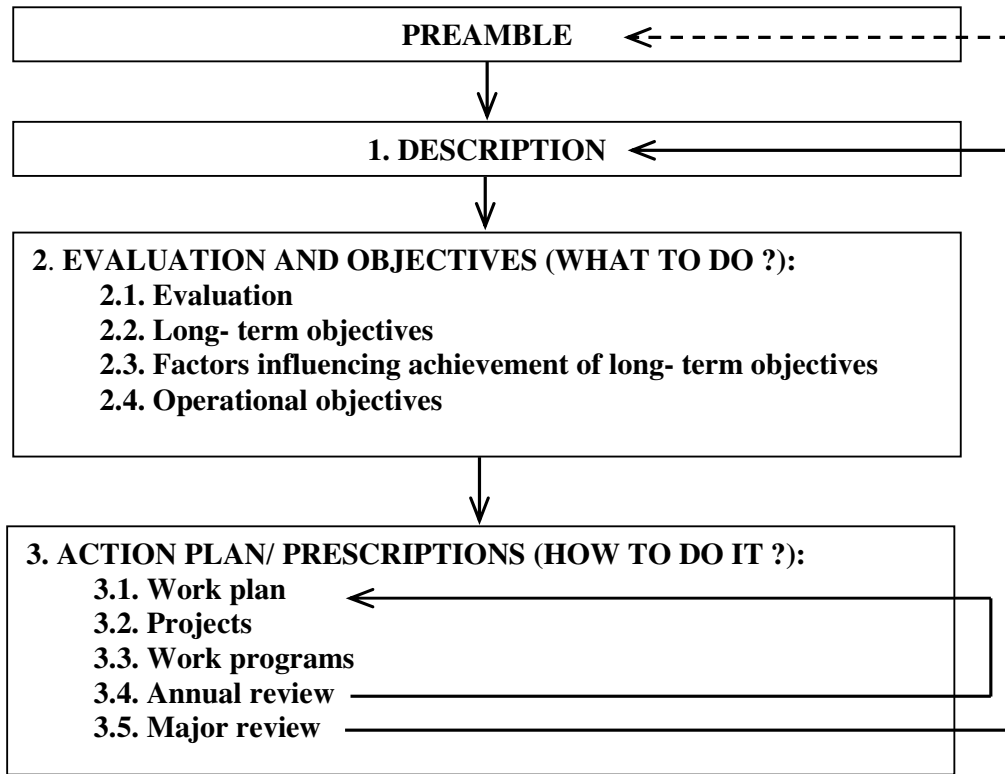


Fig. 2: Structure of the management plan (Ramsar Convention Bureau 2000)

3-Conserving Resources through Sustainable Management:

Restoring and conserving ecological and landscape values can only be achieved by application of the principle of sustainable resource management. To do this, the following operational objectives are suggested:

- 1-Improve the situation of law enforcement.
- 2-Revise legislative and institutional aspects.
- 3-Sustainable use of fish resources.
- 4-Sustainable use of reed growth.

4-Improving Socio-Economic Opportunities for Local People:

Local stakeholders should understand the principle of sustainable use of resources as a

means of maintaining the necessary levels of resources for future years. However, in most cases they are not in a strong enough financial position to reduce or set aside activities which determine their income in favor of a long-term approach. Sustainable resource management must therefore be accompanied by alternative income generation opportunities and particularly those which diversify the money-earning process. In view of this, the following operational objectives are suggested:

- 1-Initiate capacity-building schemes.
- 2-Develop eco-tourism.
- 3-Fund raising.

5-Developing Public Awareness for Nature Conservation:

The environmental and cultural values of Burullus are a resource, which is currently largely unexploited. Greater interest and knowledge can translate into using that resource, for instance in educational, interpretation and eco-tourism purposes. Opportunities thus emerge, for instance related to eco-tourism, which diversify income generation without putting further strain on the resources. The following operational objectives are suggested:

1-Raise level of public awareness.

2-Initiate publicity programs.

Additional projects are essential prerequisites if the principal objectives are to be achieved, they can be converted to an objective: to provide the administration and facilities necessary to implement management measures supporting the principal objectives.

Implementation of these programs and their component projects is an integral part of the management of the Protectorate. Some of these projects are priority activities that are basic requirements for the operation of the protected area. Others are complementary actions that ensure the sustainability of the endeavor. Some of these may be implemented in a second phase of operation. First priority projects are mainly the direct responsibility of the protected area management team. Others may require co-operation and shared responsibility between management and competent governmental and non-governmental

stakeholders. Execution of the work plan has been started in September 2003 with aiming to achieve the five main long-term objectives by 2010 through field actions (programs and projects), and establishment of effective institutional arrangements.

MAINSTREAMING ACTIVITIES:

1-Institutions Involved in the Management Plan:

Eight governmental institutions and a number of non-governmental organizations in Kafr El-Sheikh Governorate are involved in the management of Burullus Protected Area (Fig. 3):

1-Ministry of State for the Environment: Nature Conservation Sector (NCS) of Egyptian Environmental Affairs Agency (EEAA) that belong to this Ministry has the ultimate legal responsibility for the proper management of the Burullus Protected Area and its resources.

2-Kafr El-Sheikh Governorate: It is the single most influential stakeholder at the local level. It has its own Environment Office, Local Administration Councils and Investment Council. The latter institution plays an important role in the approval and allocation of land for development projects.

3-Ministry of Agriculture: The local branch of the General Authority for the Development of Fisheries Resources (GADFR), Ministry of Agriculture is responsible for the management of the Lake's fisheries. It also issues permits for the establishment of fish farms in the vicinity of the Protectorate. The

Ministry of Agriculture determines the distribution and area of rice cultivation in Nile Delta and fines farmers violating the instructions by exceeding the limits of areas allowed for this crop. Consequently, this Ministry controls to a large extent the amount of drainage water flowing into Lake Burullus.

4-Ministry of Irrigation and Water Resources:

This Ministry is responsible for water resource management and the maintenance of all watercourses in the country. It is also concerned with the volume of water in the Lake as it dams the likely sea water intrusion into the Delta.

5-Ministry of Defense: Coast Guard, which comes under the jurisdiction of the Ministry of Defense, is responsible for security and controls all illegal smuggling activities along the coast (which forms the northern border of the Lake).

6-Ministry of Interior: Police of water surfaces enforces fisheries and environmental regulations, such as restrictions concerning hunting, fishing and quail netting within the Lake. Currently, there are two police stations on the Lake shores and a third is under construction.

7-Ministry of Housing and New Communities:

This Ministry has constructed an international coastal highway between Sallum (on the border with Libya) and Rafah (on the border with Palestinian Authority), which traverses the area from east to west. Part of the highway is a bridge over the Bughaz and the rest cuts through the entire

sand bar lengthways. This highway is rapidly attracting new populations and settlements to the area. The impact of the increased human activities along the both sides of the highway is yet to be properly assessed.

8-Ministry of Health: Directorate of Public Health in Kafr El-Sheikh Governorate is responsible for health issues affecting inhabitants of the Burullus Protected Area.

9-A number of non-governmental organizations (NGOs) in the Kafr El-Sheikh Governorate also play a key role affecting land and resource use in the area. Four of these are mainly concerned with local community development and a further seven are fishermen's societies. A recent addition to the list of local "pressure groups" is the 'Charity Association for Environmental Protection'. Fishermen working in the Mediterranean Sea, outside Lake Burullus, are organized in three NGOs.

2-Advisory Committee:

The suggested management plan gives the responsibility of implementation to local-government and to local non-governmental societies. To apply this, an Advisory Committee comprising all relevant stakeholders, including representatives of relevant ministries, NGOs, local communities and fishermen associations, was designated. The Governor of Kafr El Sheikh chairs the Committee that has been given a legal status through Governorate decree issued with their structures and functions (Table 3).

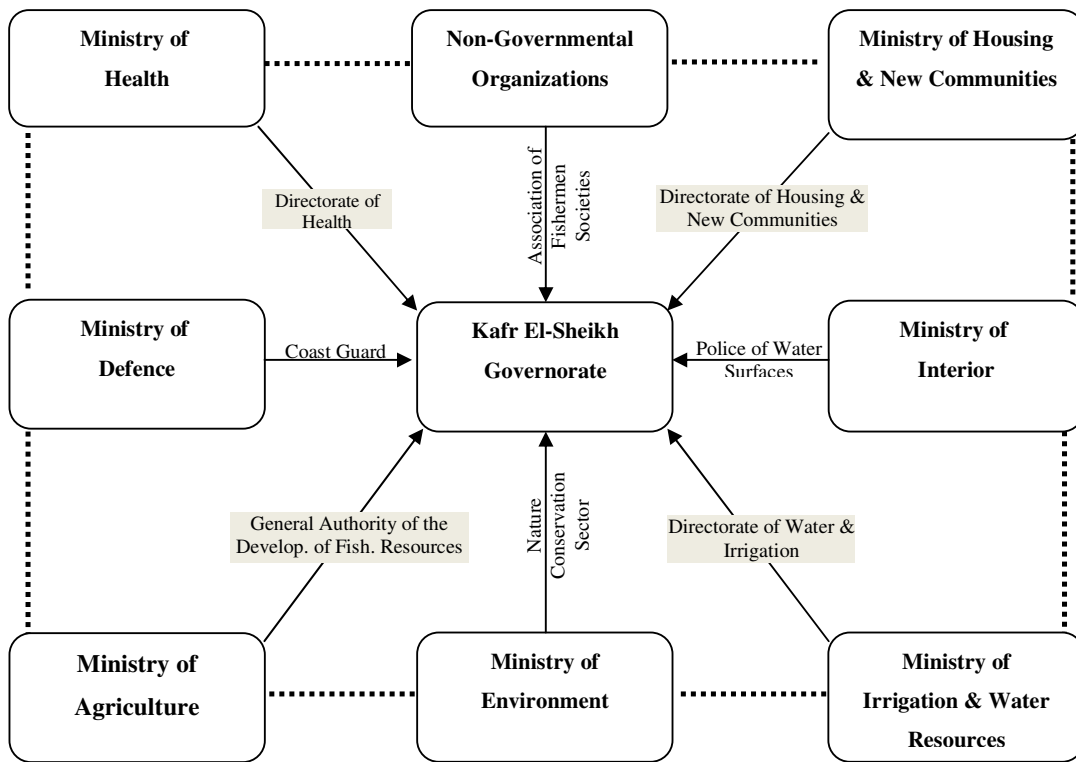


Fig. 3. Institutions Involved in the Management Plan of Lake Burullus

Table 3: Membership of the Advisory Committee

Member	Position
Governor of Kafr El-Sheikh Governorate	Chairman
Secretary-General of Kafr El-Sheikh Governorate	Vice Chairman
Manager of Lake Burullus Protected Area	Secretary
Manager of MedWetCoast Project	Member
Director of Lake Burullus	Member
Undersecretary of Ministry of Health	Member
Undersecretary of Ministry of Housing and New Communities	Member
Local Representative of Coast Guard	Member
Local Representative of Police of Water Surfaces	Member
Chief of Association of Fishermen Societies (NGOs)	Member

This Committee ensures the participation and the involvement of concerned stakeholder groups in the decision making process. Bi-monthly meetings should deal principally with the following tasks:

- 1-Setting policies for the management of the site within the framework of the management plan.
- 2-Supervising the implementation of projects indicated in the management plan.

3-Reviewing periodically the progress made by the management team in the implementation of projects.

4-proposing changes in the work plan as the need arises.

3-Executive Committee:

A further Executive Committee headed by the Manager of the Protectorate will assist the above committee (Table 4). In particular, it

undertake the following functions: 1- implement the directives of the Advisory Committee, 2- carry out the day-to-day tasks of patrolling, and 3- report to the Advisory Committee on all new developments in and around the site. These duties are additional to the official obligations and duties of the Manager, the team of rangers and other supporting staff.

Table 4: Membership of the Executive Committee

Concerned Institution	Representative
Burullus Protected Area	Manager & 2 Rangers
General Authority of the Develop. of Fish. Resources	Director of the Lake
Police of Water Surfaces	An Officer & 2 Guardians
The Four Administrative Districts Surrounding the Lake	4 Representatives
The Seven Fishermen Societies (NGOs)	7 Representatives

OUTCOMES:

The coordination between the institutions involved in the management of Lake Burullus, through the Advisory and Executive Committees, led to achieve many activities that enhance the biodiversity and productivity of the lake including the followings:

- 1-Ministry of Housing and New Communities, through its Agency of North Coast Construction, had deepened the sea inlet to increase the flow of sea water into the lake.
- 2-Ministry of Agriculture, through the General Authority of Development of Fisheries Resources, had made some radial channels (grooves at the lake bottom) in front of the sea inlet in order to distribute the sea water into the different sectors of the lake.
- 3-Ministry of Irrigation and Water Resources had made floating barriers, near the mouths

of the 7 drains that pour their water into the lake, in order to minimize the invasion of the free floating plant, water hyacinth (*Eichhorina crassipes*), into the lake's water body.

- 4-MedWetCoast Project had started to control the heavy growth of the common reed (*Phragmites australis*), using the partial cutting technique, in the narrow straits between the lake's islets. This work was done by members of the Association of the Fishermen Societies (NGOs).
- 5-To increase the ability of the Police of Water Surfaces to enforce the fishing law and to reduce the illegal activities that affect the lake's biodiversity, MedWetCoast Project had provided it with 2 motor boats.
- 6-Many awareness programs and training courses had been executed with the cooperation of all the institutions involved in

the management plan. The target of these activities was the students, fishermen, managing team, religious leaders (i.e. Imams), journalists and other informatives.

7-Construction of Visitors' Center and Accommodation Building. The center includes seminar room, small Lab, library, museum and herbarium. Equipment includes one car, three motorboats, computer, laptop, printer, overhead and slide projectors, data show, GPS, digital camera, some binoculars, stable and mobile phones. Informative signposts were set up in all sites. This was done after the cooperation between the Governorate, EEAA and MedWetCoast.

8-The management team was supported by new personnel. It is consisting now of a manager, 6 rangers, 7 technical assistants, 5 keepers, one environmental lawyer and one driver. The manager is delegated from Kafr El-Sheikh Governorate and submits a monthly report to the director of Nature Conservation Sector (EEAA). Unfortunately, most of the team members are on temporary contracts with EEAA.

9-Small grants were offered by the GEF to the 7 fishermen societies for replacing their illegal fishing gears by legal ones.

10-Biannual newsletter was issued under the title "MedWetCoast Egypt", and several posters and brochures were prepared for increasing the public awareness.

11-A book was published including the description of the biotic and abiotic components of the lake's ecosystem, the socioeconomic aspects and the details of the management plan (Shaltout and Khalil 2005).

DEFEATS & RECOMMENDATIONS:

1-Unfortunately, by the end of the MedWetCoast Project in February 2007, many activities, which were under execution, had stopped either due to lack of financial support (e.g. zoning and monitoring of water level) or due to conflicts between the different institutions (e.g. control of the common reed growth).

2-Thus, the role of the Advisory Committee should be re-formulated and re-structured from being merely consultative to the more effective function of decision-making (i.e. Management or Steering Committee).

3-Unless the institutional structures in a country are reinforced to mainstream biodiversity, they remain vulnerable to alternative development options, thus the biodiversity value may get eroded over time (Global Environment Facility 2002).

4-In addition, it is important for the Global Environment Facility (GEF) and its implementing agencies to build tools to monitor and evaluate the effectiveness of mainstreaming interventions and their eventual impact on biodiversity. Indicators can be designed at differing levels to track the outputs, outcomes, and impacts of projects and the interrelationships between these. The Cape Town workshop suggests a wide range of potential indicators for consideration by the GEF and its stakeholders (Petersen and Huntley 2005).

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نحو تعظيم الاهتمام بالتنوع الحيوي لبحيرة البرلس- شمال مصر كمال حسين شلتوت

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تقع بحيرة البرلس بين فرعي نهر النيل بمحاذاة ساحل البحر المتوسط. وهي إحدى مناطق شبكة المحميات الطبيعية المصرية، والتي تصمم وتدار بواسطة جهاز شئون البيئة المصري التابع لوزارة الدولة لشئون البيئة. وقد سجلت البحيرة كأحد مواقع اتفاقية مسار لحماية الطيور المهاجرة، وحددتها مؤسسة الطيور الدولية كأحدى مناطق الطيور الهامة على المستوى الدولي. وقد أثبتت الدراسات الحديثة أن هذه البحيرة غنية بالهائمات النباتية والحيوانية والنباتات الزهرية والحيوانات، وتشتمل على عدد من الأنواع النادرة ومقتصرة التوزيع، والمهددة بالانقراض. وتعتبر حرفة الصيد أهم مصادر الدخل للسكان المحليين؛ وتشتمل الموارد الأخرى على الزراعة، تربية الحيوانات، المزارع السمكية، حصاد البوص، صيد الطيور، السياحة والترويح. تتعرض البحيرة وما يجاورها من مواطن طبيعية إلى مهددات بيئية وإدارية، والتي أدت إلى الإضرار بالتنوع الحيوي والاستخدام الإستنزافي للموارد الطبيعية. ولتخفيف تأثير وقع هذه المهددات من أجل المحافظة على التنوع الحيوي فى البحيرة، تم اقتراح خطة إدارة تسعى لتحقيق خمسة أهداف أساسية وهي: 1- استعادة القيم البيئية والمناظر الطبيعية للمنطقة، 2- صيانة وتعزيز القيم البيئية والمناظر الطبيعية فى المنطقة، 3- المحافظة على الموارد الطبيعية من خلال التنمية المستدامة، 4- تحسين الظروف الاجتماعية والاقتصادية للسكان المحليين، 5- زيادة الوعي الشعبي من أجل المحافظة على الطبيعة.

وقد تم إعداد عدة مشروعات لتحقيق كل من الأهداف الخمسة السابقة. اشتملت خطة الإدارة على تشكيل لجنة استشارية تضم فى عضويتها ممثلين للمنتفعين ذوي العلاقة الحكومية الذين يلعبون دورا محوريا فى التأثير على الأرض واستخدام الموارد فى المنطقة (مثل المنظمات غير الحكومية، المجتمعات المحلية، وجمعيات الصيادين) وكذلك ممثلين لثمانية من الهيئات الحكومية الخدمية وهي: 1- محافظة كفر الشيخ، 2- قطاع حماية الطبيعة، 3- الهيئة العامة لتنمية الثروة السمكية، 4- وزارة الري و الموارد المائية، 5- حرس الحدود، 6- شرطة المسطحات المائية، 7- وزارة الإسكان والمجتمعات الجديدة، و 8- مديرية الصحة العامة. ومن الممكن تعديل الدور الذي تلعبه هذه اللجنة من كونها لجنة استشارية لتصبح لجنة ذات دور فاعل فى اتخاذ القرار. تشتمل الخطة أيضا على إنشاء لجنة تنفيذية يرأسها مدير محمية البرلس، والتي سوف تساعد اللجنة الاستشارية.