

**Ministry of State for Environmental Affairs
Egyptian Environmental Affairs Agency
National Biodiversity Unit**

EGYPT

FIRST NATIONAL REPORT

TO THE CONVENTION ON

BIOLOGICAL DIVERSITY

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Contents

| | Page |
|--|---------------|
| EXECUTIVE SUMMARY..... | 4 |
| INTRODUCTION | 5 |
| PART 1. MEASURES TAKEN BETWEEN 1936 AND 1994.... | 9 |
| 1. ENVIRONMENTAL LEGISLATION | 10 |
| A. NATIONAL LEGISLATION | 10 |
| B. CONVENTIONS AND AGREEMENTS | 11 |
| 2. <i>IN-SITU</i> CONSERVATION | 12 |
| A. GOVERNMENTAL ACTION | 12 |
| A. WETLAND PROTECTORATES | 13 |
| B. DESERT PROTECTORATES | 13 |
| C. GEOLOGICAL PROTECTORATES | 13 |
| B. NON-GOVERNMENTAL ORGANIZATIONS | 15 |
| 3. <i>EX-SITU</i> CONSERVATION | 16 |
| 4. DATA MANAGEMENT AND MONITORING | 18 |
| A. STUDIES AND INVENTORIES | 18 |
| B. PUBLICATIONS AND POLICY DOCUMENT | 19 |
| C. THE BIODIVERSITY DATA BASE | 20 |
| 5. EDUCATION, TRAINING AND PUBLIC AWARENESS | 21 |
| 6. BIOTECHNOLOGY AND BIOSAETY RELATED REGULATIONS AND GUIDELINES | 22 |
| PART 2. MEASURES TAKEN / TO BE UNDERTAKEN FOR THE IMPLEMENTATION OF THE CONVENTION ON BIOLOGICAL DIVERSITY..... | 25 |
| BIODIVERSITY CONSERVATION IN EGYPT..... | 29 |
| PROGRAMMES..... | 33 |
| 1. PROGRAMME FOR INSTITUTIONAL DEVELOPMENTAL AND CAPACITY BUILDING FOR BIODIVERSITY CONSERVATION IN EGYPT..... | 33 |
| 2. PROTECTED AREA IDENTIFICATION AND MANAGEMENT | 35 |
| 3. NATIONAL BIODIVERSITY INVENTORY AND MONITORING PROGRAMME | 37 |
| 4. NATIONAL WILDLIFE MANAGEMENT PROGRAMME | 40 |
| 5. BIODIVERSITY RESOURCES MANAGEMENT PROGRAMME | 42 |
| 6. NATIONAL WETLAND MANAGEMENT PROGRAMME | 44 |
| 7. NATIONAL ARID LANDS MANAGEMENT | 46 |
| 8. INTERNATIONAL CONVENTIONS COMPLIANCE PROGRAMME | 48 |
| 9. EDUCATION, PUBLIC AWARENESS RAISING AND INVOLVEMENT PROGRAMME FOR THE CONSERVATION OF NATURAL HERITAGE . | 50 |

| | |
|---|-----------|
| PART 3. CURRENT STATUS OF IMPLEMENTATION OF THE PROVISIONS OF THE CONVENTION | 54 |
| ARTICLE 6. GENERAL MEASURES FOR CONSERVATION & SUSTAINABLE USE | 55 |
| ARTICLE 7. IDENTIFICATION OF AND MONITORING BIODIVERSITY | 56 |
| ARTICLE 8. <i>IN-SITU</i> CONSERVATION | 57 |
| ARTICLE 9. <i>EX-SITU</i> CONSERVATION | 59 |
| ARTICLE 10. SUSTAINABLE USE OF COMPONENTS OF BIOLOGICAL DIVERSITY | 60 |
| ARTICLE 11. INCENTIVE MEASURES | 60 |
| ARTICLE 12. RESEARCH AND TRAINING | 61 |
| ARTICLE 13. PUBLIC EDUCATION AND AWARENESS | 61 |
| ARTICLE 14. ENVIRONMENTAL IMPACT ASSESSMENT | 62 |
| ARTICLE 15. ACCESS TO GENETIC RESOURCES | 62 |
| ARTICLE 16. ACCESS TO AND TRANSFER OF TECHNOLOGY | 62 |
| ARTICLE 17. EXCHANGE OF INFORMATION | 62 |
| ARTICLE 18. TECHNOLOGICAL AND SCIENTIFIC COOPERATION | 63 |
| ARTICLE 19. HANDLING OF BIOTECHNOLOGY AND DISTRIBUTION OF ITS BENEFITS | 63 |
| PARTNERS IN CBD IMPLEMENTATION | 64 |
| ANNEX . PROGRAMMES, PRIORITY ACTIVITIES (1998-2003) | 65 |
| 1. PROGRAMME 1 | 66 |
| 2. PROGRAMME 2 | 69 |
| 3. PROGRAMME 3 | 73 |
| 4. PROGRAMME 4 | 76 |
| 5. PROGRAMME 5 | 80 |
| 6. PROGRAMME 6..... | 82 |

EXECUTIVE SUMMARY

A unique combination of geographical, social, economic and ecological conditions have prompted governmental departments and non-governmental organizations in Egypt to take steps towards the conservation and sustainable use of natural resources long before the signing and ratification of the Convention on Biological Diversity in 1992 and 1994, respectively.

In 1997 the Ministry of Agriculture established the Egyptian Wildlife Service as the first national institution concerned with the formulation and implementation of policies pertaining to the protection of wildlife. In 1982, it was replaced with the Egyptian Environmental Affairs Agency (EEAA), which has recently become part of the Ministry of State for Environmental Affairs. Both institutions have been active in:

- (i) the promulgation of legislative tools needed for the formalization, endorsement of policies and action plans and their implementation,
- (ii) the establishment of protected areas for the *in situ* conservation of species and their natural habitats,
- (iii) the sustainable use of components of biological diversity,
- (iv) the promotion of scientific and technical research and training programmes, including the training of rangers, with the passing of law 4 for the Environment.

As from 1994 the EEAA became the national institution concerned with the issues of conservation of Biodiversity and the national obligation under the convention on Biodiversity. EEAA established a National Biodiversity Unit (NBU) that set : (1) a national study (inventory) of the Egyptian Biodiversity, (2) a national biodiversity data bank (to be linked with a national biodiversity data network), (3) a national strategy for biodiversity conservation and a national plan of action.

INTRODUCTION

The unique geographical position of Egypt at the junction between two large continents (Africa and Asia) and as part of the Mediterranean basin has indelible social, economic and biological influences on the people and the biota of the country. The two major biogeographical corridors of the Red Sea and the River Nile have also played an important role in the ecological relationships affecting the country. The Red Sea links the tropical seas of the Indian Ocean in the south with the palearctics in the north, while the River Nile links equatorial Africa with the Mediterranean basin. In addition, about 96% of the area of Egypt (about one million km²) is an arid or hyperarid desert, with the remaining 4% of arable land being restricted to the Nile Valley, the Nile Delta and the few oases scattered in the Western Desert.

As part of the Sahara of North Africa, Egypt has the climate of the Arid Mediterranean region, with notable differences between the coastal and inland parts. According to the system applied in the UNESCO map of the world distribution of arid regions (which takes into consideration the degree of aridity, the mean temperature of the coldest and the hottest months of the year and the time of the rainy period relative to the temperature regime), the country is generally divided into 4 bioclimatic provinces:

1. The hyperarid province, with mild winter and hot summer. Mean temperature of the hottest months is 20 - 30°. Rain is extremely scarce and some years might elapse without any precipitation. It includes the Eastern Desert (except the coastal mountains along the Gulf of Suez) and the southern parts of the Western Desert.
2. The hyperarid province, with a cool winter and a hot summer. Mean temperature of the coldest months is 0 - 10°. Annual rainfall is less than 30 mm, occasional and unpredictable. It is limited to the mountains massif of the southern part of the Sinai Peninsula.
3. The coastal belt falling under the climatic maritime influence of the Mediterranean Sea. Annual rainfall exceeds 100 mm (250 mm at Rafah in the east and 150 mm in Alexandria in the west), and the dry period in the summer is relatively short and attenuated.
4. The sub-coastal belt with a mild winter and a hot summer. Annual rainfall ranges between 30 and 100 mm. The dry period is relatively long and accentuated.

Under such harsh geographical and bioclimatic circumstances, it is to be expected that the biotic wealth of Egypt is not only poor relative to the area of the country but is also sparse and widely scattered. The present state of species diversity in Egypt is summed up in Table 1, which also shows (as far as can be ascertained) the number of endangered, rare and extinct species of plants, animals and micro-organisms. While certain groups (e.g. flowering plants) have been carefully surveyed and well-documented, others (e.g. mosses and liverworts) have not received adequate attention, with only a few small groups of plants (e.g. lichens) and animals (e.g. nematodes) for which no comprehensive surveys have as yet been made. The total number of species of living organisms recorded in Egypt is about 20,000. However, this number should be regarded with some caution since there is no general agreement about the number of species representing certain groups in the fauna and flora. For example, it has long been the belief of entomologists that Egypt has about 6,000 species of insects, but recent surveys have proved that the number is closer to 10,000, with innumerable unidentified specimens which on close inspection might well contribute many additional taxa.

To further compound the environmental problems, the population of Egypt has been on the increase since 1800 (Table 2, Figure 1). The dramatic population explosion, with the ensuing demands on food production, housing, education, health service, land use and water resources, has had a profound and long-lasting impact on the environment and natural resources, especially in the wake of the 'green revolution' initiated since the 1930s where a policy of intensive agriculture was adopted.

The major programme of industrialization which accelerated enormously in the second half of this century also contributed to the rapid deterioration of the environment. Unfortunately, environmental considerations have not been among the criteria for the determination of the types of industry nor in the choice of locations for the new industrial centers. Some of these centers were established in the midst of human settlements in the Nile Valley and the Nile Delta, where they became major sources of pollution to the River and its associated network of irrigation and drainage canals.

Furthermore, intensive agriculture entailed the widespread usage of agricultural chemicals in the form of fertilizers and pesticides whose residues seeped into the rural environment in general and into the irrigation and drainage system in particular. Land reclamation for agricultural and other purposes (especially the development of desert tourism) led directly to habitat destruction of numerous species of wild plants and animals.

Other major sources of threat to biodiversity in Egypt include excessive hunting of animals and cutting of plants. Excessive hunting is endangering the very existence of several species of resident and migratory birds and a number of hoofed animals (e.g. gazelles and ibex). Relatively high levels of pollutants in the air, water and soil (especially in rural areas) are threatening a large number of the indigenous plant and animal species, thus seriously affecting the

environmental equilibrium. This is leading directly to the loss of some useful components of biodiversity and a substantial increase in other harmful exotic one, such as some species of plants (e.g. the water hyacinth, the water fern *Azolla filiculoides*) and animals (e.g. rats, birds, the red spider and the American cotton worm).

On the other hand, major efforts have been made in the last two decades to improve the infrastructure of rural and urban centers throughout the country. New networks of irrigation and drainage as well as stations for waste treatment have been built. These projects are slowly beginning to show results in the form of a positive impact in improving the environment.

Little wonder, therefore, that Egypt was among the first group of countries to recognize the importance of the conservation of nature and natural resources. This is clearly evident from the fact that Egypt was among the signatories of numerous international conventions and agreements as early as 1936 . Such active interest in the conservation of biological diversity, natural resources and heritage culminated in the signing and ratification of the Convention on Biological Diversity (CBD) in 1992 and 1994 , respectively. This convention requires the contracting parts to fulfill certain obligations and take the appropriate steps to achieve the following 3 main objectives:

- (i) conservation of biological diversity,
- (ii) sustainable use of its components, and
- (iii) fair and equitable sharing of the benefits arising from the utilization of genetic resources.

While the 30 articles of the Convention prescribe in detail the various spheres of activity which should lead collectively to the fulfillment of these obligations, Article 6 requires the contracting parties to develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity and integrate them into relevant sectoral or cross-sectoral plans, programmes and policies. Furthermore, the second conference of the parties to the CBD decided (Decision, II/7) that the first national report by parties “ will focus in so far as possible on the measures taken for the implementation of Article 6 of the Convention “. Therefore, this report consists of two parts : Part 1 will cover the measures taken by Egypt in the field of environmental conservation prior to the ratification of CBD in 1994 (i.e. between 1936 and 1994), while part 2 deal with the efforts made so far towards the formulation of a draft strategy and plan of action for the conservation and sustainable use of biological diversity.

Table 2. The pollution of Egypt between 1800 and 1996 with the expected figure for 2001 . The data is supplied by the Statistics Department of the National Demographic Council.

| Year | Population | Year | Population |
|-------------|-------------------|-------------|-------------------|
| 1800 | 2,488,950 | 1947 | 19,096,000 |
| 1821 | 2,540,000 | 1960 | 26,096,000 |
| 1846 | 4,500,000 | 1968 | 31,693,000 |
| 1848 | 4,542,000 | 1985 | 48,000,000 |
| 1872 | 5,210,287 | 1986 | 48,205,049 |
| 1877 | 5,517,627 | 1988 | 50,700,000 |
| 1882 | 6,804,000 | 1989 | 52,000,000 |
| 1897 | 9,715,000 | 1992 | 58,194,000 |
| 1907 | 11,287,000 | 1995 | 60,000,000 |
| 1917 | 12,705,000 | 1996 | 61,452,000 |
| 1927 | 14,218,000 | 2001 | 67,922,000 |
| 1937 | 15,933,000 | | |

Part I

Measures taken between 1936 and 1994

(Before ratification of the Convention on Biological Diversity)

1. ENVIRONMENTAL LEGISLATION

A. National Legislation

The legislative tools for biodiversity conservation and sustainable development in Egypt pre-date the ratification of CBD. They were issued as laws and ministerial decrees and can be summed up in chronological order as follows:

1. Law 53 of 1966 (also known as “The Law of Agriculture”). Among the numerous articles and clauses of this law, article 117 prohibits the hunting of birds and other wild animals useful to agriculture. It also bans the trading and killing of these birds as well as the destruction of their nests. Article 118 of the same law prohibits the cultivation of plants harmful to these birds and wild animals, bans the importation of material used in their hunting and prevents the use of all forms of traps. The prevention of cruelty to animals is spelled out explicitly in article 119 .

2. Ministerial Decree 28 of 1967 specified the species of birds and other wild animals under protection covered by article 117 of the previous law.

3. Law 72 of 1968 concerning the prevention of pollution of sea water by oil.

4. Ministerial Decree 349 of 1979 established the Egyptian Wildlife Service as the first governmental authority concerned with the protection of wildlife in the country.

5. Ministerial Decree 66 of 1982 prohibited hunting all species of birds and other wild animal in certain areas of the Sinai Peninsula, as well as fishing and catching all species of molluscs and corals in various other specified regions.

6. Law 48 of 1982 for the protection of the River Nile and other water courses against pollution. It prohibits the discharge of solid, liquid and gaseous wastes with certain levels of pollutants into the Nile and all freshwater bodies; while the Ministry of Irrigation determined the maximum allowable levels of polluting elements in such wastes, the Ministry of Health is empowered to carry out the required analysis of samples of these wastes.

7. Law 102 of 1983 set up the legal framework for the declaration and management of protected areas and regulates the conservation of natural resources.

8. Law 101 of 1985, levied an additional tax on airplane tickets issued locally, in order to secure a suitable source of funding to finance programmes for developing tourism and environmental protection.

9. Law 4 of 1994 is by far the most comprehensive environmental legislation to date. It defines (in article 2-13) the scope and responsibilities of the Egyptian Environmental Affairs Agency (EEAA), establishes (in articles 14 - 16) the Environmental Protection Fund (EPF), provides for the setting up of a system of environmental incentives (articles 17 - 18), spells out the necessity of environmental impact assessments as a pre-requisite of development projects (articles 19 - 23), establishes environmental monitoring networks with their stations and working units (article 24), authorizes the EEAA to prepare an Environmental Contingency Plan (article 25), and forbids the hunting of specified types of wild birds and animals (article 28) as well as the destruction of their natural habitats. Articles 29-83 cover the protection of air, water and land from all sources of pollution. Articles 84-101 deal with the penal code for violation of articles 1 - 83 . In August 1997 the EEAA has become part of the newly established Ministry of State for Environmental Affairs.

Despite the many obvious strengths of this array of legislative tools, it is generally felt that there is an urgent need for laws regulating some aspects of the conservation and sustainable use of biological diversity such as the importation of genetically modified organisms (GMOs), the transfer of biotechnology institution responsible for law enforcement, additional coordination between laws governing environmental affairs and tourism, and the protection of intellectual property rights. These gaps are adequately addressed in the draft National Strategy and Action Plan (NBSAP) for the conservation and sustainable use of components of biological diversity (see part 2).

B. Conventions and Agreements

Since 1936, Egypt is party to a large number of regional and international conventions, treaties and agreements dealing with the conservation of nature in general and biodiversity in particular. The following list is extracted from the latest edition of UNEP's Register of International Treaties and Other Agreements in the Field of the Environment 1996:

- Convention Relative to the preservation of Fauna and Flora in their natural state. London, 1933 (ratified in 1936).
- Agreement for the Establishment of a General Fisheries Council for the Mediterranean. Rome, 1951.
- International Plant Protection Convention. Rome, 1953
- International Convention for the Prevention of Pollution of the Sea by Oil. London, 1963.
- Phyto-sanitary Convention for Africa. Kinshasa, 1968.

- African Convention on the Conservation of Nature and Natural Resources. Algeria, 1968. (ratified in 1972).
- Convention for the Protection of the Mediterranean Sea Against Pollution. Barcelona, 1976 (ratified in 1978).
- Convention on International Trade in Endangered Species of Wild Fauna and Flora. Washington, 1978.
- International Convention for Regulation of Whaling. Washington, 1981 (ratified in 1989).
- Convention on the Conservation of Migratory Species of Wild Animals. Bonn, 1979 (ratified in 1982).
- United Nations Convention on the Law of the Sea. Montego Bay, Jamaica, 1982 (ratified in 1983).
- Protocol Concerning Mediterranean Specially Protected Areas. Geneva, 1983 (ratified in 1986).
- Convention on Wetlands of International Importance especially as Waterfowl habitat. Ramsar, Iran, 1971 (1975), (ratified in 1988).
- Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment. Jeddah, 1990.
- Convention on Biological Diversity, Rio de Janeiro, 1992 (ratified in 1994).
- Agreement for the Establishment of the Near East Plant Protection Organization. Rabat, Morocco, 1993 (ratified in 1995).
- International Tropical Timber Agreement. Geneva, 1994 (ratified in 1996).
- Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean. Barcelona, 1995.

2. *IN-SITU* CONSERVATION

A. GOVERNMENTAL ACTION

Long before the 13 provisions of article 8 of the CBD became effective in 1994, and in recognition of the significance of biodiversity conservation, Egypt has been active in the *in situ* conservation of wildlife, natural resources and natural habitats. This is clearly manifested in the declaration of 18 protected areas (Table 3) by Prime Ministerial Decrees since 1983 when Law 102 was promulgated by the People's Assembly. The 18 protectorates declared so far cover about 7.5% of the total area of the country. An extensive project is currently underway to discover additional environmental "hot spots", and it is intended to increase the nature reserves to cover 15% of the total area of Egypt by 2017. The existing and proposed natural protectorates are shown in the computer-generated map in Figure 2. They cover the following three main environmental categories:

a. WETLAND PROTECTORATES

The wetlands represent an environmental rarity in Egypt, since 96% of the area is an arid or semi-arid desert. Under such circumstances they are especially significant for all forms of life. This category includes a representative selection of 10 Egyptian wetlands at: (1) Ashtoom El Gameel in Lake Manzala, (2) Zaraneek in Lake Bardaweel (N. Sinai), (3) Sabkhat Al-Ahrash (N. Sinai), (4) Ras Mohamed National Park (at the southern tip of the Sinai Peninsula), (5) Nabq Multiple Use Management Area (on the Gulf of Aqaba), (6) Abu Galum Multiple Use Management Area (on the Gulf of Aqaba), (7) Taba Protectorate (covering the set of fragile ecosystems between Nuwaiba and Taba on the Gulf of Aqaba), (8) Lake Qaroun (in the Western Desert), (9) Wadi El-Rayan (close to the preceding), and (10) Saluga and Ghazal Islands (in the southern part of the River Nile at Aswan).

b. DESERT PROTECTORATES

They include: (i) the St. Catherine Protectorate in the central parts of the mountainous massif of southern Sinai, (ii) the Wadi Allaqi Biosphere Reserve traversing the southern parts of the Eastern Desert, (iii) the Elba Protectorate (the largest in Egypt) occupying the southeastern corner of the country, (iv) the Omayed Biosphere Reserve in the Western Desert close to the Mediterranean Sea shore, and (v) the Wadi El-Asyuti Protectorate in the central section of the Eastern Desert.

c. GEOLOGICAL PROTECTORATES

Only 3 protectorates of this category have been designated so far; they are: (i) the Hasana Dome representing the Abu Rawash formation which extends between Al-Maghara mountain in N. Sinai and Bahariya Oasis in the Western Desert and dates back to the Cretaceous, (ii) the Petrified Forest at Maadi east of Cairo belonging to the Oligocene, and (iii) the Middle Eocene Cave of Wadi Sannour in the Western Desert.

Table 3. Basic Information on the 18 protectorates of Egypt

| Protectorate | Category | Area (in km ²) | Management plan | Annual revenue (in LE) |
|----------------------|----------|----------------------------|-----------------|------------------------|
| Ashtoom El-Gameel | A | 35 | -- | |
| Zaraneek | A | 230 | -- | |
| Sabkhat Al-Ahrash | A | 4 | -- | |
| Ras Mohammed | A | 200 | + | 2,000,000 |
| Nabq | A | 600 | + | |
| Abu Galum | A | 500 | + | |
| Taba | A | * | -- | |
| Lake Qaroun | A | 250 | -- | |
| Wadi El-Rayan | A | 1225 | -- | 85,000 |
| Saluga and Ghazal | A | 0.5 | -- | |
| St. Katherine | B | 5750 | -- | |
| Wadi Allaqi | B | 30000 | -- | |
| Elba | B | 35600 | -- | |
| Omayed | B | 700 | -- | |
| Wadi El-Asyuti | B | 24 | -- | |
| Hasana Dome | C | 1 | -- | |
| Petrified Forest | C | 7 | -- | |
| Cave of Wadi Sannour | C | 9 | -- | |

* The most recent protectorate; boundaries and area are currently being defined.

The funding of protected areas in Egypt consists of:

- (i) LE 2.7 million *per annum* from the Egyptian Government,
- (ii) LE 10.2 million from the Egyptian Government + 4.25 million ECU supplied by the European Community for the two phases (1986 - 1991 and 1991 - 1996) of establishing the three protectorates of the Gulf of Aqaba (Nabq, Abu Galum and Ras Mohamed). Funding for the third phase (1996/97 - 2000/2001) of the same protectorates consists of 10 million ECU from the European Community in addition to LE 8 million supplied by the Egyptian Government.
- (iii) for the protectorate of St. Katherine the current funding includes 6 million ECU from the European Community and 7 million LE from the Egyptian Government for the period (1996 - 2001).

Table 3 also shows that Egypt still has a long way to achieve a satisfactory state of affairs in these nature reserves. Of the 18 protectorates only the 3; the Ras Mohammed Sector (in S. Sinai) have management plans, and all 18 suffer a severe shortage of trained manpower and adequate funding. However, baseline studies of biodiversity, land use monitoring and/or the socio-economic aspects of

4 other protectorates (Wadi El-Rayan, St. Katherine, Wadi Allaqi and Omayed) have been carried out as a step towards the formulation of management plans for them. Furthermore, work on establishing the necessary infrastructure (research laboratories, conference rooms, recreation facilities, visitors' centers) is currently in various stages of completion for 6 protectorates: Zaraneek, Wadi El-Rayan, St. Katherine, Wadi Allaqi, Omayed and the Petrified Forest. In view of the meager financial resources appropriated to the protected areas of Egypt and the relatively short period of time, these efforts may be regarded as a notable achievement.

B. NON-GOVERNMENTAL ORGANIZATIONS

The Egyptian Government encourages and supports the establishment of various non-governmental organizations (NGOs) especially those working in the fields of the environment. This explains the relatively large number of such NGOs as can be found in the Directory of NGOs in the field of environment (see Publications). Some of these NGOs are more active than others, but collectively they play an indispensable role in the *in situ* conservation of biodiversity and public awareness. The following is only a sample of the more prominent NGOs in Egypt.

| NGO | No. of members | Headquarters |
|---|----------------|--------------|
| Tree Lovers Society | 320 | Cairo |
| The Civil Society for Environmental Protection ("Friends of the Environment Society") | 500 | Giza |
| The National Society for Environmental Protection | 100 | Qaliubia |
| The Central Society for Environmental Protection | 275 | Cairo |
| "Friends of the Environment" Society in Alexandria | 165 | Alexandria |
| "Friends of the Environment and Development" Society (FEDA) | 200 | Giza |
| The Society for the Protection of Nature | 900 | Cairo |
| The Society for the Protection of the Environment in Assiut | 150 | Assiut |
| The Society for Environmental Protection in Suez | 100 | Suez |
| The Egyptian Society for Health and Environmental Legislation | 179 | Cairo |
| The Egyptian Society for Genetics and Heredity | 672 | Cairo |
| The Egyptian Botanical Society | 515 | Giza |
| The Egyptian Society for Entomology | 1564 | Cairo |
| The Egyptian Society for Zoology | 420 | Giza |

Work of the Tree Lovers Society, for instance, has been exemplary in protecting cultivated trees against fire and deliberate cutting, in enhancing public awareness (especially among school children) of the environmental and aesthetic importance of trees, and in the cultivation of trees in derelict and densely populated areas. Through the prevention of cutting the old Eucalyptus trees surrounding the Zoo at Giza, members of this Society have also succeeded in preserving the favorite habitat of the largest community of Cattle Egrets *Egretta ibis* Linnaeus, 1758) in Egypt. The Egyptian Society for Entomology is one of the oldest NGOs in the country and houses the largest referral collection of insects (see Table 4).

3. *EX-SITU* CONSERVATION

With the generous help of UNEP (project GF/0313-94-43) an institutional survey of major referral collections of plants, animals and micro-organisms has been carried out by the National Biodiversity Unit (NBU) and resulted in the compilation of a comprehensive list of zoos, botanic gardens, herbaria, museums, mycological and entomological collections, and seed banks together with their facilities and unmet needs. These collections (listed in Table 4) are spread across the country in universities, research centres and NGO's. They vary considerably in size, coverage and scientific and cultural significance. Here follows a list of some of these major collections:

1. The Botanic Gardens at Orman (Giza), Qobba Palace (Cairo), Antoniadis (Alexandria), and the Botanic Island (in the River Nile, Aswan) together with the relatively small but highly significant collections of cultivators of date palm (at Senaniya near Damietta, Sohag, and N. Sinai), olive (in N. Sinai and along the shores of the Nile Delta), citrus (at Zagazig), and rice (at Kafr El-Sheikh).

2. The 6 comprehensive entomological collections housed at: (i) The Department of Entomology, Faculty of Science, Cairo University, (ii) The Department of Entomology, Faculty of Science, Ain Shams University, (iii) The Department of Plant Protection, Faculty of Agriculture, Al-Azhar University (better known as the Alveri collection), (iv) The Egyptian Entomological Society, (v) Institute of Plant Protection, Ministry of Agriculture, and (vi) The Agricultural Museum, Ministry of Agriculture.

3. The largest two herbaria in Egypt kept at the Botany Department, Faculty of Science, Cairo University (CAI) and the Agricultural Museum, Ministry of Agriculture (CAIM).

4. *Ex-Situ* Conservation of Plant Genetic Resources in Egypt.

In the past a number of institutions and individuals collected plant germplasm all over the country according to their need and in the absence of a national programme.

Recently, a national programme for *Ex-Situ* conservation in Egypt has been developed. A new National Plant Genetic Resources Unit (The Genebank of Egypt) is being established.

At present there is a plant Genetic Resources Section in the Field Crop Research Institute, Agricultural Research Center, Ministry of Agriculture and Land Reclamation. A total number of about 10000 germplasm accessions are stored in 3 cold stores (63 m³ cold store running at + 5°C, 79 m³ cold store running at - 5°C and 124m³ cold store running at- 20°C). These conservation facilities are old and in poor working conditions.

A Plant Genetic Resources Station, under the Desert Research Center, has been established in El Sheikh Zuwayed at the Northern Coast. Field collections of fruit species are maintained at this station (18 acres). Two new cold stores [one running at -20°C and the other 50m³- running at -4°C] are under construction. One seed drying unit will be also available in April 1998.

5. Microbial Genetic Resources

Culture collections are available at various institutions in Egypt. A Microbiological Resources Center (MIRCEN) was established in 1977 with support from UNEP as one of the Microbiological Resources Centers network established under the auspices of UNESCO/ UNEP / ICRO, to serve various aspects of Applied and Environmental Microbiology in the Arab Region and North Africa.

The Objectives of the centre are to : i) provide the infrastructure for a world network incorporating regional and interregional cooperating laboratories geared to the management, distribution and utilization of the microbial gene pool; ii) reinforce efforts relating to the conservation of microorganisms, with emphasis on gene pools of the food and biofertilization microorganisms; iii) foster the development of new inexpensive technologies for the region; iv) promote the applications of microbiology in order to strengthen rural economies; and v) serve as a focal center for the training of manpower and dissemination of biotechnology and environmental information.

The centre undertakes the following activities :

- 1. Collect, identify, conserve and distribute microbial cultures of economical and industrial importance.**
- 2. Execute and collaborate with different studies and applied in the fields of Biotechnology, Genetic Engineering, Biofertilization, Microbial Control,**

Environmental Pollution and Utilization of Agricultural and industrial Wastes and By-products.

- 3. Develop the technical skills and scientific knowledge through training courses, symposia and conferences dealing with utilization of microorganisms.**
- 4. Provide scientific information and render guidance in the field of Applied Microbiology for individuals, scientific institutions and industrial organizations.**
- 5. Cooperate with other MIRCENs and the various Culture Collection Centers all over the world .**

4. DATA MANAGEMENT AND MONITORING

With assistance from UNEP, the NBU set out to implement a major project (GF/013-94-43) for biodiversity data management and monitoring. The project included a number of sub-projects concerning data gathering, inventories for various taxonomic groups, establishment of a biodiversity data base to serve as the nucleus of a network of data bases to be established in various institutions in the country, and the dissemination of information through publications, networking with other data bases as well as through international media (e.g. INTERNET). The NBU organized two workshops for assistance in building biodiversity data management capacity and networking of information. The first was held in 16-18 January 1996 and the second in 25-28 March, 1996. Proceedings of the two workshops have been published in two newsletters issued in March and August, 1996, respectively.

A. STUDIES AND INVENTORIES

In order to implement the country study on biodiversity in Egypt along the guidelines provided by UNEP, the NBU commissioned teams of national experts to prepare detailed inventories on their respective groups of plants, animals and micro-organisms. Their efforts yield 68 volumes, some of which have been published by the NBU while others are currently being prepared for publication. Although the exact numbers of species and infra-specific taxa in any major group of plants and animals is subject to various taxonomic considerations, it is now possible to know the approximate numbers of species and infra-specific taxa representing each of these major groups in the fauna and flora of Egypt. Another important outcome of this phase of the country study has been to identify gaps in our knowledge of the local biota. For instance, it is now evident that certain groups (e.g. lichens, nematodes) have not been surveyed before. The NBU aims to bridge such gaps and has already contracted national experts to prepare the required inventories.

This is an on-going process. Documents dealing with other groups of plants (e.g. lichens) and animals (e.g. comb jellies, flat worms, acorn worms) for which no surveys have as yet been made are currently in the course of preparation.

The NBU has also sponsored the synthesis of a wealth of information on the ecosystems in the northern lakes (Bardaweel, Manzala, Borullus, Idku and Mariut) and Lake Nasser; these studies are currently being prepared for publication.

Three detailed studies have also been prepared by national experts commissioned by the NBU for the establishment of a national gene bank, a national centre for the captive breeding of rare and endangered species of plants and animals, and a natural history museum. For this purpose, these experts paid several visits to similar institutions in Europe, USA and South Africa. The studies included the choice of suitable sites, architectural plans, requirements of technical and administrative personnel, programmes of training, libraries, logistics and detailed budgets for construction and maintenance.

In order to ensure the participation of the largest possible number of stakeholders in the process of data management, the NBU has organized two workshops and two training courses. The former have been held in Cairo (November, 1992) and Sharm El-Sheikh (September, 1993) and attended by national and international experts in the field of environmental data management. The latter followed in January and March, 1996 and have been attended by numerous rangers of protected areas, curators and keepers of referral collections, post-graduate students from universities and research centers and some NGOs.

B. PUBLICATIONS AND POLICY DOCUMENTS

In addition to a large number of well-designed and illustrated booklets, posters, brochures and pamphlets depicting numerous species of plants, birds, fish, corals, mammals and other biota in their natural habitats, the NBU has published 11 specialized volumes dealing with various taxonomic groups. The 11 specialized volumes listed below were directed mainly at universities and research centers both at home and abroad.

ALEEM, A.A. (1993). The marine algae of Alexandria, 138 pp + 55 plates.

**BISHAY, H.M. & KHALIL, M.T. (1997). Freshwater Fishes of Egypt.
Publication of National Biodiversity Unit, No. 9, 229 pp.**

- BOULOS, L. (1995).** Flora of Egypt: Checklist. Al Hadara Publ., Cairo, Egypt. 283 pp.
- EL-ABYAD, M.S.H. (1997).** Biodiversity of Fungal Biota in Egypt. Updated Checklist (including distribution, abundance and function). Publication of National Biodiversity Unit, No. 7, 113 pp.
- IBRAHIM, M. (1995).** ed. Natural Protectorates of Egypt. Publication of National Biodiversity Unit, No. 2, 168 pp.; also published in Arabic.
- KASSAS, M. (1993).** ed. Habitat Diversity: Egypt. Publication of National Biodiversity Unit, No. 1. 302 pp. + 1 map.
- KASSAS, M., ELBADRY, E., BISHAI, H., EL-HAWARY, E. & EL-GAZZAR, A. (1995).** Egypt: Country Study on Biological Diversity. Publication of National Biodiversity Unit, No. 5, 217 pp. Published in 1993 in Arabic as Publication of National Biodiversity Unit, No. 3.
- SALEH, M.A. (1997).** Guide to the Reptiles of Egypt, Publication of National Biodiversity Unit, No. 6; in press.
- THARWAT, M.E. (1997).** Birds Known to Occur in Egypt. Publication of National Biodiversity Unit, No. 8, 203 + xxi pp. & Appendix.
- WASSIF, K. (1995).** Guide to Mammals of Natural Protectorates in Egypt. Publication of National Biodiversity Unit, No. 4, 172 pp. + 64 colour plates; in Arabic with Latin nomenclature.

C. THE BIODIVERSITY DATA BASE

A simple but highly efficient system of data storage and retrieval has been set up by the NBU to incorporate available information on representatives of the various taxonomic groups in Egypt. It covers data on the taxonomy, ecology, biology (e.g. life-form, life-cycle, reproduction, nutrition, pathogenecity, behavior, etc.) status, frequency, local and global distribution, conservation measures and economic value of every species of plants, animals and micro-organisms. A computerized format has been designed to accommodate available information on taxa representing each major group in the fauna and flora using the programme ACCESS for Windows 3.11, and formats of all groups are linked in a collective screen to facilitate the search for any group, any taxon, any item of data or any combination of them. So far, available information for about 35% of the biota of Egypt are included in this data base and work is going on to include the rest.

The hierarchical biodiversity data base has the added advantage of including a number of subsidiary data bases. Most notable among them is the biodiversity library whereby all references pertaining to individual taxa are

accumulated (in alphabetical order) so as to enable the user to obtain: (i) a full list of references dealing with any taxon or group of taxa, (ii) a full list of publications of any author(s), and (iii) a full list of the taxa covered in any particular reference.

The data base is especially versatile and useful in tracking the local and global distribution of individual species and groups of species. It is easy to retrieve full lists of:

- (i) all localities inhabited by a particular taxon, and
- (ii) all taxa of any group of plants, animals or micro-organisms recorded from any locality specified either by name (village, town, city, region or governorate) or by map grids.

Figure 3 illustrates the first screen in the procedure of searching for the local distribution of species and their groups. The NBU aspires to expand this feature of the biodiversity data base to include global distribution of the species and their groups as well.

Although the data base so far includes geographical information for only about 35% of the species, it is gratifying to find that such lists and the accompanying distribution maps are being frequently requested by NGOs, researchers in various disciplines and decision makers from all parts of the country. Feedback from users of such lists and maps clearly indicates their usefulness in a wide range of fields.

Another major feature of the data base is the set of on-line identification keys designed specifically for use by both amateur and professional biologists. The keys intended for use by professionals are of the usual taxonomic non-indented type, while those targeting the amateur user depend primarily on illustrations in the form of line drawings and colour figures. Detailed description of both types of key together with the methodology of their preparation and usage have been given in previous progress reports on biodiversity data management in Egypt submitted to UNEP in 1995-97. So far it has been possible to incorporate keys for the identification of the species of Acari and the genera of grasses known to occur in Egypt, and they are being continually refined and improved to be as easily practicable and accurate as possible. Keys to representatives of other groups will also be added in due course.

The biodiversity data base is regarded as the nucleus of a national network of data bases pending the availability of suitable funding. It is also intended to make the data base globally accessible through the INTERNET.

5. EDUCATION, TRAINING AND PUBLIC AWARENESS

School and university curricula in biological, medical, veterinary and geological sciences have been changed during the last decade to include courses dealing with various topics of the environment including biodiversity and the importance of its conservation. This is an aspect of educational development in Egypt, which clearly indicates a growing appreciation of the significance of such topics and their positive impact on future generations.

Since the signing of the biodiversity convention, two workshops have been organized by the NBU in November, 1992 and in September, 1993 at the Hunting Club (Cairo) and at Sharm El-Sheikh (S. Sinai), respectively. They dealt primarily with the various issues concerning biodiversity conservation and the sustainable use of natural resources, especially in view of the recent developments in tourism, industry and agriculture in order to minimize their impact on biota and natural habitats. In March and August 1996, the NBU has also held two training courses for school teachers, herbarium curators, museum keepers, rangers of protectorates as well as a number of interested attendants from various ministries and NGOs. The main theme of lectures and field excursions of both induction courses has been the biodiversity data management, and their proceedings form the subject matter of two issues of the Newsletter of EEAA.

The media have been mobilized to participate actively in a nation-wide campaign of public awareness for environmental conservation. Daily press publish weekly pages while radio and TV channels broadcast programmes directed at all age groups and explaining in simple terms a wide spectrum of topics ranging from natural history, biotechnology and the benefits of conserving natural resources to the problems ensuing from global warming, pollution, acid rain and desertification.

6. BIOTECHNOLOGY AND BIOSAFETY RELATED REGULATIONS AND GUIDELINES

As a developing country with an increasing population (see Table 2 and Fig. 1), Egypt is continually facing demands of increasing food production both qualitatively and quantitatively. Attempts to achieve such increase are being made through the application of the traditional methods of plant and animal husbandry, as well as a gradient of other biotechnologies including plant tissue culture, embryo transfer in animals, recombinant DNA (r-DNA) research and genetic engineering of plants, animals and micro-organisms. The production and release of such genetically modified organisms (GMOs) have raised concern

about possible risks to man and the environment, especially with reference to the following questions:

- * will the use of r-DNA techniques accidentally create new pests?
- * can r-DNA techniques accidentally convert a non-pathogen into a pathogen?
- * Can introduced gene(s) spread uncontrollably in microbial populations?
- * Will r-DNA engineered microorganisms alter soil microbial communities?

Therefore, the r-DNA Advisory Committee of the USA National Institute of Health (NIH) has developed procedures for examining and assessing the safety of proposed experiments and published extensive guidelines on the conditions under which all types of experiments involving the production of GMOs should be carried out. These guidelines were published in 1976 to be applied only to NIH-funded research activities; later, they became binding to all institutions that received funding from any agency of the USA government. However, these guidelines were formulated exclusively for the laboratory use of r-DNA and did not extend to cover the introduction of GMOs to the environment of containment greenhouses and small-scale field testing.

In January, 1994 the Agricultural Genetic Engineering Research Institute (Agricultural Research Centre of the Ministry of Agriculture and Land Reclamation) released an important and comprehensive document outlining in some detail the regulations and guidelines of biosafety in Egypt (see APPENDIX I). This document provides specific proposals for policies and procedures that national authorities may wish to consider in establishing a biosafety system tailored to the Egyptian environment.

Implementation of the policies and procedures of biosafety is assigned to a National Biosafety Committee (NBC), whose membership includes:

- * Representative from the Ministry of Agriculture
- * Representative from the Ministry of Education
- * Representative from the Ministry of Industry
- * Representative from the Ministry of Health
- * Representative from the State Ministry of Environmental Affairs
- * Representative from the private sector
- * Policy makers and consultants knowledgeable in policies and applicable laws
- * Non-technical members representing the interests of the community with respect to health and environmental protection.

Activities and responsibilities of the NBC are defined as:

- * **formulation, implementation and updating of biosafety codes,**
- * **risk assessment and license issuance,**
- * **coordination with national and international organizations,**
- * **provision of training and technical advice,**
- * **reporting at least annually to governmental authorities.**

In order to ensure the competence necessary to review r-DNA research activities, the NBC will be assisted by an Institutional Biosafety Committee (IBC) to be established in each facility conducting r-DNA research. The activities of IBCs are set out as follows:

- * **assemble a comprehensive set of research- and containment-oriented guidelines that are tailored to the research activities of the institute and that comply with the Biosafety Guidelines determined by the NBC,**
- * **establish a programme of inspection to ensure that the physical containment facility continues to meet the safety requirements,**
- * **assessment of the facilities, procedures and practices of the institute and of the training and expertise of personnel involved in r-DNA research,**
- * **review periodically r-DNA research conducted at the institute to ensure that the requirements of the NBC guidelines are being fulfilled,**
- * **adopt emergency plans covering accidental spills and personnel contamination resulting from r-DNA research,**
- * **review periodically containment measures and facilities, taking into account new scientific and technical knowledge relevant to treatments of disposals and spills of biohazardous wastes,**
- * **monitor changes in intellectual property rights issued at the national and international levels,**
- * **report annually to the National Biosafety Committee.**

The Biosafety Guidelines as defined by the NBC cover in detail:

- (i) **the procedure required for assessment of risks arising from the deliberate release of genetically modified organisms (GMOs) into the environment,**
- (ii) **biosafety guidelines for laboratories,**
- (iii) **biosafety guidelines for containment greenhouses, and**
- (iv) **biosafety guidelines for field trials and small-scale testing of GMOs.**

PART 2

Measures Taken/to be undertaken for the implementation of the Convention on Biological Diversity

As indicated earlier, Egypt is endowed with a rich natural heritage as valuable as its cultural heritage; ranging from breathtaking desert landscapes, colorful coral reefs, spectacular untouched wilderness, pristine coasts, a rich and fascinating wildlife, unique geologic formations, and a high diversity of biological components and ecosystems. However, given the current rapid rate of development in Egypt, many unique ecosystems, land forms, biological components, and other natural heritage resources, are swiftly being lost and irreparably degraded (many of these resources are not represented in the existing Protected Areas, and some do not lend themselves to protection in a site based system). This waste of the country's irreplaceable natural heritage is often unjustifiable, occurring mainly due to ignorance, severe under-valuing of these resources, and limited enforcement of measures to control and monitor development activities, in order to ensure optimal utilization of all natural resources.

As the country's future is dependent on the wise and sustainable use of these and other natural resources, the Government of Egypt is committed to the conservation of the country's renewable and non-renewable natural heritage, for the benefit of present and future generations. Egypt was therefore amongst the first countries that signed the Convention in Rio in 1992 and ratified it in 1994.

Following is a brief review of priority biodiversity conservation issues for which Egypt has initiated / will undertake necessary measures within the framework of the Convention.

Habitat degradation

Solid waste disposal. Building debris, municipal wastes, etc. are disposed of throughout the landscape near urban settlements. These dumps can cover vast areas of land very quickly. Solid domestic waste, particularly plastics, is also rapidly infesting all Egyptian habitats, but it is most evident in open desert habitats, severely reducing the natural and wilderness values of vast areas.

Mining and quarrying. Mining and quarrying activities are exploiting ever larger areas of Egypt's deserts. Vast areas of the northern part of the Eastern Desert have been transformed into extensive extraction sites. The desert landscape has been destroyed, vital top soil is broken up and many important features are being lost. One extreme example is the total loss through quarrying of the oolitic ridge, which used to extend from Alexandria to El Alamein, for building blocks for tourist developments along the Mediterranean coast. The problem extends to seemingly remote areas like the mountains of South Sinai and the northern rim of the Qattara Depression.

Overgrazing is a widespread problem in many of Egypt's deserts and semi-deserts, particularly in the northern part of the country where the meager winter rain fall supports a scant plant cover. Overgrazing is severe in Sinai and along Egypt's Mediterranean coast, west of Alexandria. The problem is increasing as the number of Bedouins and their livestock continues to grow.

Unregulated use of off-road vehicles particularly for recreation and tourism has increased dramatically in recent years in Egyptian deserts. This is leading in some regions to severe degradation of desert vegetation, disruption of top soil, and long term scarring to the landscape.

Ecologically unsound infrastructure development. Little care is taken during the design and construction of most large scale infrastructure developments, such as highways, power-lines, etc., which have the potential to impact vast areas of Egypt's landscape. For example, roads in desert regions can block surface water drainage, causing severe physical damage and altering run-off vegetation in down stream sections of shallow wadis. Road construction techniques and practices in Egypt are also very destructive, mutilating the landscape and destroying vegetation.

Habitat loss

Land reclamation. The ever growing need for food in Egypt means that horizontal expansion of cultivated land area is always an important objective. In most cases, favorable areas support rich natural habitats with considerable natural and biological importance. Steppe and semi desert habitats, as well as wetland habitats and their margins are the most targeted in Egypt.

Urban encroachment. Egypt's urban centers occupy vast territories and are expanding rapidly. In many areas rich habitats (especially in coastal regions) and valuable agricultural land adjacent to urban centers are being indiscriminately swallowed up by expanding cities and villages.

Tourist developments have especially targeted the coastal zone, both along the Mediterranean and the Red Sea. In the past decade some 10% of the country's coasts have been occupied by tourist villages and hotels. An even larger percentage of coastline has been sold or designated for further development. The loss of coastal habitats should perhaps be Egypt's primary conservation concern.

Pollution

Pesticides and fertilizers. Intensive and unregulated use of pesticides and fertilizers has plagued the agricultural landscape. Runoff laden with fertilizer and pesticide residues is drastically changing the ecology of many wetlands, particularly in the northern Delta.

Domestic and industrial effluents. Untreated industrial and domestic effluents are contributing to the ecological degradation of many of Egypt's wetlands, including the Nile River. Due to wetland degradation, fisheries and fishing communities can be adversely impacted.

Oil pollution is mostly an issue in the Red Sea and the Gulf of Suez. Oil spills still occur in this region, but at smaller scale and frequency than in years past. This is probably in part due to the growth of the tourist industry and more strict regulations promoted by the EEAA. The risk to wildlife from oil spills in the marine environment is very well documented.

Introduction of exotic / alien species. Alien / exotic species, including genetically modified organisms, have been identified as the second largest threat to biological diversity after habitat degradation. They may cause environmental damage and economic loss. Introduction of alien species may also harm the many services and functions provided by nature such as water supply. Many exotic species were recorded from the River Nile. Many were also introduced by the agricultural sectors.

Uncontrolled hunting and fishing

Sports hunting. There are relatively few Egyptian sport hunters, probably ranging between 1000 and 2000 individuals. While game birds like ducks, doves and quail are the main quarry, mammals such as ibex and gazelle, or even crocodiles are also illegally hunted.

Hunting tourism. There is small hunting tourism industry in Egypt. In the past excessively large numbers of birds were killed, including those protected under Egyptian law. While there has been substantial improvements in the management of bird hunting tourism in Egypt, violations continue to be reported, such as hunting of non-game species.

Foreign hunters from Gulf countries have been a serious problem and have been a focus of public concern since it was brought to attention in the early nineties. The primary quarry of these hunters is the Houbara Bustard *Chlamydotis undulata*, a protected species, but large mammals, particularly gazelles have also been hunted. Such hunters have been decimating desert wildlife populations.

Pest control. Indiscriminate methods are often employed by farmers and even promoted by the Ministry of Agriculture to control birds and other wildlife perceived as pests, leading in many cases to extensive damage to non-target species.

Bird hunting. Bird hunting and trapping along the Mediterranean coast is a traditional pastime during autumn bird migration. It is estimated that several million birds are annually caught during that season. Waterbird hunting and

trapping is traditional activity taking place in the Delta Lakes during winter. It is estimated that several hundred thousand waterbirds are annually caught.

Fisheries. Over-fishing is common in Egypt both in freshwater and marine environments, which has led to significant declines in fish stocks. In addition, indiscriminate and destructive fishing techniques continue to be utilized. Globally threatened freshwater and marine species protected under international agreements, such as sea turtles, are still caught and sold in Egypt.

No mechanisms are in place to regulate these activities, many of which are excessive and threatening several animal and plant species with extinction.

Biodiversity conservation in Egypt:

Egypt is one of the earliest civilizations known to have adopted some form of nature conservation. Ancient Egyptians made rules concerning the use of wilderness areas, hunting and the treatment of wild animals. Those, considered sacred were protected.

Protected Areas

Today, nature conservation efforts in Egypt have focused primarily on establishing Protected Areas, with the objective of protecting the country's best known sites of outstanding biodiversity/natural value, aiming at maintaining the diversity and viability of the various components of Egypt's biodiversity, and to ensure their sustainable utilization. Since the passage of law 102 for 1983 concerning the establishment of Protected Areas, 18 Protected Areas have been declared in Egypt, totaling some 75,000 km², or 7.5% of the country's total land area, and representing several of the country's main natural regions.

Protected Areas are administered by the Nature Conservation Section of the EEAA. Most of the existing Protected Areas have some infrastructure, and are starting to assume some of their varied responsibilities, particularly in the field of public education. Protected Areas have, generally, been the most effective conservation tool applied in Egypt to date, and some are already succeeding in achieving "sustainable conservation" (as in South Sinai), and are contributing positively to the economies of the regions where they occur.

Other Efforts

Many efforts have also been made to address natural heritage issues outside the scope of Protected Areas. Hunting and trade in wildlife resources are problems which have received considerable attention by EEAA in recent years, with a fair amount of success.

National Legislation

Law 102/1983 for Natural Protectorates. This is the most important nature conservation legislation in Egypt, establishing the legal framework for the creation and management of protected areas. The EEAA is the competent authority responsible for its implementation.

Law No. 4/1994 for the Environment. Although Law 4/94 focuses largely on pollution issues, there are a number of provisions in the law having implications for nature conservation and hunting management in Egypt: Article 28 forbids the hunting, shooting and catching of species listed by previous Ministry of Agriculture decrees, or by international conventions to which Egypt is party.

Law No. 53/1966 The Agriculture Law. Chapter 3 contains the main legislation protecting wildlife, specifically, birds useful to agriculture, and certain endangered mammals and reptiles.

International Conventions

Egypt is party to several international conventions to protect and maintain biodiversity, protect migratory species, regulate the trade in wildlife and protect certain important habitats. According to Article Number 151 in the Egyptian Constitution, any international convention to which Egypt is a party, becomes the law of the land in Egypt and takes precedence over Egyptian law. According to Law 4 for 1994, the EEAA is the competent national authority for overseeing international and regional environmental conventions. Compliance with the relevant international obligations has been addressed to varying extents. In light of Egypt's obligation to the Biodiversity Convention, a National Biodiversity Unit was established, and maintains a national biodiversity data base, with the objective of maintaining and monitoring biodiversity in the country.

The main biodiversity conservation related conventions which Egypt has signed are as follows:

- African Convention on Conservation of Nature and Natural Resources (Algiers 1968).
- Convention on Wetlands of International Importance Especially as Waterfowl Habitat (RAMSAR) (Ramsar 1971).
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (Washington 1973).
- Convention of the Conservation of Migratory Species of Wild Animal (CMS) (Bonn 1983).
- Convention on Biological Diversity (Rio 1992).
- Specially Protected Area Protocol of the Barcelona Agreement .
- African-Eurasian Migratory Waterbird Agreement (AEWA) (The Hague 1995).

Current status of the Implementation of the Provisions of the Convention on Biological Diversity:

Egypt has undertaken various activities with the aim to implement the provisions of the Convention. These are summarized in PART 3 of this report.

The Future Agenda

Today, there is a growing realization of the urgent need to halt, or at least slow down, the speed at which the country's biological resources are being degraded. It is a priority to identify the nature conservation needs for the country, establishing the most effective, informed and objective actions and measures to start resolving the issues at stake.

Objectives:

The central objectives of the National Biodiversity Strategy of Egypt are those of the CBD.

- The conservation and sustainable management and utilization of Egypt's natural heritage, for the benefit of contemporary and future generations equitably.

Specific objectives include:

1. To maintain the nation's biological diversity, including landscape character and ecological viability;
2. To achieve sustainable utilization of Egypt's natural heritage, so as to optimize economic and social returns from natural systems in a fashion that ensures their long term maintenance and evolution;
3. To optimize economic and social returns from the nation's natural systems in a fashion that insures their long term sustainable maintenance;

Goals:

1. By the year 2000, establish a capable and functional administrative and technical framework, that is financially self sufficient, and can effectively address the wide spectrum of nature conservation related issues on a national level, and can carry out other components of this strategy, efficiently.
2. Identify the main components of Egypt's network of Protected Areas covering 15% of the country's territory (as recommended by the IUCN and declared in the GOE current Five Year Plan). All of the sites within the network will be declared and designated by the Year 2000.

3. **Initiate and upgrade the management process for Protected Areas. An immediate goal is for five of the most valuable and vulnerable Protected Areas to be under appropriate management by the Year 2002. Management will optimize the sustainable utilization of the resources they contain.**
4. **Establish a sound economic rational and mechanisms for natural heritage conservation measures (e.g. for Protected Areas, hunting management, etc.), which addresses both the conservation needs of the resources at hand, and the development requirements of the country.**
5. **Promote the utilization of certain (appropriate) Protected Areas as a high premium-ecologically sensitive tourism resource.**
6. **Protect and manage natural heritage resources not regulated by Law 102 (i.e. outside Protected Areas and their adjacent buffer zones) in a fashion that addresses the growing needs of development in Egypt, ensures their long-term sustainable maintenance and optimizes their economic and social output.**
7. **Establish a functional and effective wildlife (e.g. hunting and fishing) management system, by the year 2000.**
8. **Full compliance with all international conventions concerned with natural heritage conservation to which Egypt is signatory, by the year 2004.**
9. **Establish a comprehensive information, monitoring and assessment system for the natural heritage resources of Egypt.**
10. **Increase public, and decision makers, understanding and appreciation of Egypt's natural heritage, and participation in its conservation.**
11. **Development of a national biosafety framework for addressing questions of potential risk to the environment and human health.**
12. **Establish a Natural History Museum to house the complete referral collections of the taxonomic groups of the biota of Egypt.**
13. **Establish a National Gene Bank to include collection and for the maintenance of genetic resources (races, wild relatives of crops and fodder plants, poultry and farm animals); preservation of genetic materials in laboratory (in vitro), in fields of the Gene Bank (ex-situ) and in their natural habitats (in-situ), and preservation of genetic materials of microorganisms.**
14. **Initiate a Captive Breeding Centre(s) to function as ex-situ conservation of rare and endangered species of plants and animals.**

PROGRAMMES

To achieve the above mentioned goals, focus will be on the following programmes:

1. Programme for Institutional Development and Capacity Building for Biodiversity Conservation in Egypt

1. The problem:

Egypt lacks national capacity in the field of biodiversity conservation and sustainable use, which is hampering the nation's ability to conserve and manage its unique and critical biological resources. The EEAA has yet to establish an effective and sustainable institutional structure enabling the agency to fulfill its responsibilities under Law 102/1983, Law 4/1994 and international nature conservation conventions. Furthermore, Line Ministries and governorates lack capacity in natural resource management and continue to implement projects which needlessly and detrimentally impact Egypt's natural heritage.

2. Description of programme:

This programme has two components:

Component 1: Develop the structure and build the capacity of the Nature Conservation Section (NCS) in EEAA to fulfill its mandate under Law 102, Law 4 and international environmental conventions.

Component 2: Capacity building within, and networking between, other Line Ministries, Governorates and other government organizations having an impact upon Egypt's natural heritage resources. This would include the development of decision support systems based upon inclusion of sound environmental information.

3. Activities:

Component 1: Institutional building for the Nature Conservation Section of the EEAA.

- a. Identify gaps and implement changes to address the institutional and training requirements of the NCS, along with the necessary linkages and coordination measures with other EEAA departments;**
- b. Launch institutional strengthening programs in priority departments at the section;**
- c. Conduct training programs for key personnel.**

Component 2: Capacity building in natural heritage management within other government bodies at the National and Governorate levels.

- a. Launch institution strengthening programmes in priority departments in key Line Ministries and Governorates which are involved in natural heritage management or are impacting natural heritage resources;
- b. Conduct training programmes for government bodies at the National and Governorate Levels.
- c. Monitor and advise on National and Governorate-level policies and activities that impact the natural heritage resources of Egypt and develop mechanisms to mitigate or control such activities.
- d. Develop and implement social-economic tools and incentives for the optimal management of Egypt's natural heritage, to help remedy the inadequate integration of natural heritage conservation considerations into Egypt's development policies, plans, and programmes, as well as in environmental impact assessments.

4. Scale of implementation:

The programme would be implemented at a National and Governorate levels.

5. Implementation status:

An institution strengthening and capacity building programme is currently underway for the NSC by European Union (EU).

6. Main participants:

EEAA, Line Ministries, Governorates

7. Role of the EEAA:

The EEAA would be the main implementers of the project and coordinate as needed with the other participating bodies.

8. Overlaps with other sectors:

2. Protected Area Identification and Management

1. The problem:

Many of Egypt's important and unique habitats are not represented in the nation's Protected Area Network. Also, most of those Protected Areas that have been identified and designated are still lacking proper management.

2. Description of programme:

This programme involves two components

Component 1: Identify the National Protected Areas network. Identification involves the establishment of a system plan that assesses all existing, candidate and potential protected areas, and assesses them through field and desk studies. The Protected Area network should encompass all of the nation's most outstanding natural heritage resources, important centers for biodiversity and a proportional representation of the country's natural habitats.

Component 2: Develop management and infrastructure of the Protected Areas network, including the development and implementation of management plans for existing protected areas, e.g. Elba National Park, Red Sea Islands Protected Area and Zaraneek Protected Area and other priority areas to be proposed as an outcome of identification process. These plans should address the integration and development needs of local communities, the sustainable utilization of the resources which they contain, the potential for eco-tourism and their role as focal points for regional planning.

3. Activities:

Component 1: Protected Area Identification and Prioritization

- a. **Develop and apply criteria and procedures for selecting and evaluating protected areas.**
- b. **Produce a proposal for a comprehensive network of protected areas for official designation and management.**

Component 2: Protected Area Management

- a. **Operate all the Protected Areas, through comprehensive management plans based on sound scientific, managerial and economic factors.**
- b. **Identify and provide the full complement of well-trained and equipped staff, appropriate visitor facilities and monitoring and enforcement mechanisms for the Protectorates.**

- c. Explore the opportunities for wider private sector participation in the management of protected areas.
- d. As a model, establish a regional development program with Protected Area(s) as the focal point.
- e. Identify, develop and implement ecologically sound systems for tourist activities within selected protected areas. This recognizes the unique value and experiences which Egypt's natural protectorates can provide. Action is required to promote certain protectorates for high-premium nature-based tourist packages. These will be organized by the tourist industry, but controlled by EEAA, with the objective of increasing revenues from the area with minimal impact on the areas natural resources.

4. Scale of implementation:

The activities will be coordinated at the national level, with management and implementation at Governorate and local levels.

5. Implementation status:

Component 1 is being undertaken, Component 2 has been initiated (e.g. Ras Mohammed Protected Area) but the majority of the component is still to be undertaken. The Italian Government is undertaking a project for Wadi El Rayan Protected Area and the United States government is working on the Red Sea Island National Park.

6. Main participants:

EEAA, Governorates, The Scientific Community, Ministry of Tourism, NGOs, Local Communities

7. Role of EEAA:

The agency is legally responsible for the identification, designation and management of Protected Areas and will be the main implementing body for this programme.

8. Overlaps with other sectors:

3. National Biodiversity Inventory and Monitoring Programme

1. The problem:

While there exists a great deal of information about Egypt's biodiversity, information is lacking in some fields and is outmoded in others. Information is essential to make qualified and informed decisions about natural resource management, in particular for setting priorities and developing sound nature conservation policies and actions. In addition, there is insufficient coordination and cooperation between all concerned parties in Egypt for the data collection, storage and analysis of biodiversity, habitat/landscape diversity and other natural heritage resources. Egypt also lacks sufficient facilities for biodiversity study and research.

2. Description of programme:

This programme will establish the necessary systems and facilitates to inventory, evaluate and monitor Egypt's natural heritage and biodiversity. The programme will have several components:

Component 1: The National Biodiversity Unit (NBU) within EEAA will be strengthened to be a focal point to coordinate and facilitate biodiversity research and monitoring.

Component 2: There will be institution strengthening and capacity building for other organizations involved in biodiversity research and monitoring, particular at scientific collections, research institutes and universities.

Component 3: A Natural History Museum will be established to promote the study and research of biodiversity either in Egypt or the region (Middle East/North Africa).

3. Activities

Component 1: National Biodiversity Unit (NBU) at the EEAA

- a. Institution strengthening for the NBU;
- b. Training programmes for key personnel;
- c. Establish or develop monitoring and assessment programmes for biodiversity and natural heritage resources, including:
 - Biodiversity databases for scientific use and environmental impact assessments (EIA);
 - Habitat and landscapes inventory(s);
 - National natural heritage sensitivity map (encompassing critical habitats, migratory corridors and bottlenecks, biodiversity hot-spots, etc.).

- Red data lists for fauna and flora;
 - Regularly updated status statements for various resources (species, habitats, etc.);
 -
- d. **Develop cooperation and coordination mechanisms between the NBU and other EEAA departments, as well as other national and international bodies involved in biodiversity research and monitoring;**
 - e. **Facilitate the dissemination and exchange of information (such as through a newsletter, website, workshops, publication of periodicals, etc.);**
 - f. **Monitor and assess biotechnology advances and applications;**
 - g. **Investigate and promote opportunities for economic measures applicable to biodiversity conservation, such as bio-prospecting fees and patents.**

Component 2: Capacity building among all Egyptian organizations, including NGOs, involved in biodiversity inventory and monitoring.

- a. **Develop the network and coordination mechanism between the organizations involved in biodiversity research and monitoring in Egypt and abroad;**
- b. **Institution strengthening for key organizations involved in biodiversity research and monitoring in Egypt;**
- c. **Conduct training in biodiversity inventory and monitoring, particularly within the scientific community;**
- d. **Provide small grants to institutes, universities and NGOs to support and promote biodiversity research and monitoring. Research areas include:**
 - **Surveys of species and habitat richness;**
 - **Habitat and species conservation and management;**
 - **Taxonomy and species variation;**
 - **Chemical screening of species;**
 - **Socio-economic studies.**

Component 3: Establishment of a National Natural History Museum.

- a. **Continue support for reference collections until such time as the museum has been established;**
- b. **Produce the necessary pre-project studies to establish a Regional or National Natural History Museum;**

- c. Establish the institution and its collections;
- d. Develop training, education and research programmes for the facility.

4. Scale of Implementation:

National, Governorate and local levels.

5. Implementation status:

Partly ongoing programme, but requires considerable strengthening. UNEP with GEF funding has been providing support for projects at the National Biodiversity Unit include the National Biodiversity Country Study, Data Bank and Strategy. The Academy of Science has devised feasibility studies for the Natural History Museum.

6. Main participants:

National Biodiversity Unit, Academy of Science and Scientific Research, Universities, National Institutes, Zoological and Botanical Gardens, NGOs.

7. Role of the EEAA:

The EEAA will implement Component 1 and 2 and will cooperate with the Academy of Science for Component 3.

8. Overlaps with other sectors/programmes:

4. National Wildlife Management Programme

1. The problem:

Wildlife utilization for the most part is unregulated in Egypt and excessive numbers of wild animals are being hunted. Due to over-hunting and fishing, the populations of many species are declining with some species on the verge of extirpation from the country. Unlike in other nations, there is no comprehensive system for hunting management in Egypt. Many organizations have responsibilities for hunting management, with overlapping roles and insufficient coordination between the different bodies. There is also insufficient trained personnel, facilities and other resources necessary to regulate hunting and fishing. Little revenue is generated from hunting regulation and the funds raised are not re-invested back into the management and protection of wildlife and their habitats.

2. Description of programme:

This programme will consist of the development a comprehensive system of wildlife management in Egypt with sustainable management and financial systems.

3. Activities

- a. Establish Wildlife Management Department at the EEAA;
- b. Establish Wildlife Management Units in priority Governorates and On-line Miniseries;
- c. Launch institution building programmes for the EEAA, Governorate units and participating On-line Ministries involved in hunting and fishing management;
- d. Training for key personnel in wildlife management, particularly in hunting and fishing regulation;
- e. Develop a comprehensive system for hunting and fishing management in Egypt, including policies, regulation and licenses, along with coordination and enforcement mechanisms with other concerned organizations and economic instruments to ensure sustainable revenue generation whenever possible for:
 - Sport hunting and fishing by Egyptian nationals;
 - Sport hunting and fishing for tourism;
 - Hunting by hunters from other countries (Houbara Bustard, Gazelles);
 - Traditional bird hunting activities (i.e. quail, songbirds, waterbirds, falcons);
 - Wildlife trade for pets and its products;
 - Import and export trade in wildlife and wildlife products;
 - Commercial fishing;
 - Pest control;
 - Research and scientific collections.

- f. Revise and strengthen existing legislation, drafting new legislation if necessary;
- g. Devise and implement a system for CITES management in Egypt;
- h. Establish a hunting management data base,
- i. develop and support wildlife research and monitoring,
- j. establish a number of hunting reserves, which are scientifically managed to ensure the sustainable utilization of wildlife resources within them.

4. Scale of implementation:

National, Governorate and Local Levels.

5. Implementation status:

The OSP-EEAA produced a hunting management study which identifies wildlife management requirements for the country

6. Main participants:

EEAA, Ministry of Interior, Ministry of Defense, Egyptian Wildlife Service (EWS) and the General Authority for the Development for Fisheries Resources (GDFR)/ Ministry of Agriculture, Governorates, Shooting Clubs.

7. Role of the EEAA:

The EEAA will take the lead role, other agencies and organizations will implement components as appropriate.

8. Overlaps with other sectors:

5. Natural Heritage Resources Management Programme

1. The problem:

There is an absence of comprehensive legal protection for natural heritage resources outside the Protected Areas. Much of the country's habitats, wildlife and landscapes are being destroyed and degraded at an alarming rate due to insufficient protection, monitoring and management.

2. Description of programme:

This is a programme to address the adverse impacts of current activities on, and to develop protection measures more specific to the management of, natural heritage resources largely outside Protected Areas (i.e. not under the auspices of Law 102). This should include development of plans and legislation for landscape and habitat conservation, as well as initiatives for the conservation of endangered species.

3. Activities:

- a. Identify and devise legal and other measures and initiatives to respond to problems and gaps in the protection and management of Egypt's natural heritage outside the protected areas.
- b. Establish a Natural Heritage Monitoring Unit at the EEAA to assess and monitor priority wildlife population and critical habitats. This unit would also undertake all research and monitoring for the section, such as that related to Protected Area and Wildlife Management.
- c. Develop assessment and monitoring programmes for critical wildlife population and habitats.
- d. Produce and implement management plans, as well as other measures for the conservation of critical habitats outside the Protected Area network.
- e. Produce and implement management plans for specifically endangered species that are designed to halt and reverse their decline.
- f. Establish captive breeding and reintroduction programmes for priority endangered species.
- g. Establish or develop within an academic or scientific institution of a Middle Eastern/ North African Regional seed bank of international standards of indigenous flora (both feral and wild strains), as an alternative reservoir of genetic and as a controlled and regulated source for commercial research.

4. Scale of implementation:

The programme will be implemented at the national and Governorate levels.

5. Implementation status:

There is an IUCN project to assess the status of Cheetah in Egypt, as well as a proposed project to conserve Mediterranean sea turtles. For the time being, there are no other species conservation initiatives in Egypt.

6. Main participants:

EEAA; Ministry of Agriculture agencies

7. Role of the EEAA:

The EEAA will take a lead role in some components and will coordinate others.

8. Overlaps with other sectors:

6. National Wetlands Management Programme

1. The problem:

Egyptian wetlands are among the most important and productive ecosystems in the country. The Nile River provides the nation with nearly all of its water resources. The Nile and the lakes also provide the country with its fisheries, an important source of protein and livelihood. In addition, Egyptian wetlands are one of the richest ecosystems in the country in biodiversity and are considered internationally important staging, wintering and breeding areas for waterbirds.

Egypt's wetlands are subject to a variety of man-made threats which are leading to the degradation of this invaluable national resource. The northern lakes have been substantially reduced in size as a result of land reclamation. Nearly all wetlands in Egypt are polluted with industrial, domestic and agricultural drainage water not only leading to changes in the ecology of the lakes, but causing health problems in surrounding communities. Over fishing and hunting is also prevalent at most wetlands in Egypt. While the problems facing Egyptian wetlands have received national and international attention, insufficient action has been taken for the management and preservation of the wetlands and their resources.

2. The description of programme:

This programme will seek to establish a national framework for wetlands management and develop and implement integrated management plans for priority wetlands.

3. Activities:

- a. Establish and strengthen a special unit at the Nature Conservation Section of the EEAA to devise, coordinate and follow-up on wetland management as specified under the Ramsar Convention.
- b. Produce and implement a National Wetland Action Plan that will address the necessary legislative, institutional and policy actions along with coordination measures for improved management and conservation of Egyptian wetlands.
- c. Devise and implement management plans at priority wetlands (e.g. Lake Manzala, Lake Borullus, Lake Bardaweel).
- d. Develop a system and initiatives for wetland research and monitoring.
- e. Launch projects to abate pollution of Egyptian wetlands.

- f. Develop and support projects to improve management of fisheries, hunting and other natural resources from Egyptian wetlands.**
- g. Build national capacity in wetland management through training programmes, workshops and seminars.**
- h. Launch national public awareness campaigns to increase understanding and appreciation of Egyptian wetlands and encourage the management and conservation of this important national resource.**

4. Scale of implementation:

The programme will be implemented at the national, Governorate and local levels.

5. Implementation status:

There are some on-going initiatives related to wetland management, including at Wadi El Rayan and Lake Qaroun in El Fayoum, Lake Mariut and Lake Nasser. Most of the waste water treatment projects under construction will have positive consequences for Egyptian wetlands. The RAMSAR Conservation Fund and Dutch government have supported some limited training in wetland management.

6. Main participants:

EEAA, General Authority for the Development of Fisheries Resources (GADFR) and other Ministry of Agriculture agencies, Ministry of Public Works and Water Resources, Tourist Development Authority (TDA), Governorates.

7. Role of EEAA:

The EEAA will take a lead role in some components and will coordinate others.

8. Overlaps with other sectors:

Water Resources, Industrial Pollution, Agriculture.

7. National Arid Lands Management Programme

1. The problem:

While over 95% of Egypt is desert, there is little awareness and appreciation of this important national resource. Egypt's deserts have significant reserves of oil, gas, minerals and other non-renewable natural resources. The deserts are also rich in biodiversity harboring restricted range and globally threatened species. This vast wilderness area with its spectacular scenery and numerous cultural heritage sites is becoming an increasing important resource for tourism. Only a small percentage of the population resides in the desert, but these peoples still depend heavily on native flora for grazing and fodder for domestic livestock, fuel, building materials, herb, remedial medicines and other products.

Most desert regions in Egypt are coming under threat as a result of rapid and inappropriate development. Many areas with high natural heritage value and importance for biodiversity are being destroyed and degraded as a consequence of uncontrolled tourism, land reclamation, quarrying and solid waste dumping. Overgrazing and collection of vegetation is a problem in most rangelands threatening the livelihood of the local population. This and inappropriate land reclamation techniques is causing desertification in sensitive areas, such as along the North Coast. Over hunting of wildlife in the desert has led to severe declines in populations of a number of species, particularly large mammals. Cultural heritage sites in the desert due to their remoteness are being vandalized and degraded.

2. The description of programme:

This programme will seek to establish a national framework for the management of arid lands and will develop and implement integrated

management plans for desert areas which are valuable rangelands and important natural and cultural heritage sites.

3. Activities:

- a. Produce a National Arid Land Management Action Plan that will address the necessary legislative, institutional and policy actions along with coordination measures for improved management and conservation of desert regions;
- b. Devise and implement integrated management plans for desert areas which are priority rangelands or have important natural and cultural heritage sites;
- c. Launch projects to mitigate degradation of key arid lands(e.g. waste management).

- d. Develop and support other projects to improve natural resource management and alleviate property in desert regions (e.g. providing alternative fuel sources);**
- e. Develop and support arid lands research and monitoring programmes;**
- f. Build national capacity in arid lands and rangeland management through training programmes, workshops and seminars;**
- g. Launch national public awareness campaigns to increase understanding and appreciation of deserts and encourage the management and conservation of this important national resource.**

4. Scale of implementation:

The programme will be implemented at the national, Governorate and local levels.

5. Implementation status:

There are an on-going natural resource management projects by the GTZ-EEAA and World Bank in the North Coast near Marsa Matruh. The EU for South Sinai Protectorates, particularly St. Catherine's, also addresses many of these issues.

6. Main participants:

EEAA, Ministry of Agriculture, Governorates.

7. Role of EEAA:

EEAA will take the lead role in some components and will coordinate others.

8. Overlaps with other sectors:

Land Use, Solid Waste Management, Tourism and Cultural Heritage.

8. International Conventions Compliance Programme

1. The problem:

Egypt has signed a number of international and regional agreements for the conservation of natural habitats and species. To date, there has been insufficient compliance of the provisions of the conventions in Egypt. For most agreements, the country has yet to establish the necessary framework to implement the conventions on a sustainable basis. Institutions, legislation and coordination and management systems are lacking to enable the nation to enforce the convention. Furthermore, compliance has been hampered by the low awareness of the conventions and their importance in Egypt.

2. Program description:

Establish the necessary institutions, legislation and other mechanisms to comply with Egypt's international and regional obligations dictated by the conventions to which it is signatory, specifically:

- Rio (Biodiversity)
- CITES (Trade in wildlife)
- Bonn (Migratory species)
- Man in the Biosphere Programme
- Specially Protected Area Protocol
- Ramsar (Wetland protection)
- Red Sea (marine and coastal)
- Barcelona (marine and coastal)
- World Heritage (natural and cultural heritage)
- African-Eurasian Waterfowl Agreement

3. Activities:

- a. Identify the requirements to ensure effective compliance of international and regional agreements in Egypt.
- b. Establish the necessary framework, with the necessary legislation, policies and other mechanisms, to comply with convention provisions.
- c. Establish or strengthen the necessary institutions to implement the conventions.
- d. Conduct training to improve convention compliance.
- e. Support monitoring, assessment and other initiatives as mandated under the conventions.
- f. Develop and implement education and public awareness activities to encourage support for and compliance of the agreements.

4. Scale of implementation:

The programme will be primarily implemented at the national levels and as needed at the Governorate and local levels.

5. Implementation status:

There are a few on-going initiatives to improve convention compliance; for example, the NBU is involved developing a National Biodiversity Strategy as required under the Biodiversity Convention.

6. Main participants:

EEAA, Line Ministries

7. Role of the EEAA:

EEAA will have lead role as the national body responsible for international environmental conventions according to Law 4/1994

8. Overlaps with other sectors:

9. Education, Public Awareness Raising and Involvement Programme for the Conservation and Sustainable Utilization of Biological Diversity

1. The problem:

Low public awareness and appreciation of nature heritage is an underlying factor contributing to the unsustainable and excessive use of these resources both by government and the private sector. Education and information providers have limited knowledge about Egypt's natural heritage and its importance. Furthermore, there is a lack of high-quality and interesting information about the rich and unique diversity of nature that exists either nationally or locally. The private sector is among the primary users of natural heritage resources, but undervalues and over exploits or inappropriately utilizes these resources largely as a result of lack of awareness. While the government is increasingly looking towards businesses, NGOs and local communities to assist in environmental protection, these bodies lack sufficient capacity and expertise in natural resource management. There is also insufficient private sector initiatives to serve as models for the sustainable and wise use of natural heritage resources.

2. Description of programme:

This programme will consist of a number of components:

Component 1: Build public awareness capabilities within the nature conservation section of EEAA;

Component 2: Improve the quantity and quality of information about natural heritage and capacities of information distributors to disseminate this information.

Component 3: Integrate natural heritage and biodiversity conservation into the national education curriculum and build education institution and teaching capacities in this field.

Component 4: Increase awareness and appreciation in the business, NGO and local community about natural heritage issues and develop the capacities of these bodies to support initiatives for the sustainable and wise use of natural heritage resources.

3. Activities:

Component 1: EEAA Conservation Education and Public Awareness Department

- a. **Develop the department's capacities to create and implement conservation and public awareness programmes;**
- b. **Produce education and public awareness materials for the department on natural heritage issues, such as brochures, posters, audio visual programmes and information packages and a newsletter or magazine.**
- c. **Establish a data base and network to disseminate information to national and international organization.**
- d. **Establish a mobile unit and exhibits.**
- e. **Devise and implement education programmes centered on the Natural Protectorates.**
- f. **Devise and implement public awareness programmes on biodiversity for the National Biodiversity Unit.**
- g. **Devise and implement other education and public awareness programmes related to key natural heritage resource management issues, such as Hunting Management, International Conventions, etc.**

Component 2: Capacity building programme for information distributors for natural heritage conservation.

- a. **Establish a service to provide technical support, training and other materials (video film, photographs) related to natural heritage to information distributors;**
- b. **Produce printed and audio visual materials and information packs for the key information distributors focusing on Egypt's natural heritage;**
- c. **Conduct workshops and training with the main distributors of information in Egypt, e.g. written and broadcast media, government information units, religious leaders, etc.. for dissemination of information relating to natural heritage issues;**
- d. **Develop a weekly or monthly television / radio shows about natural heritage issues for broadcast nationally.**

Component 3: Natural heritage education in the national curriculum

- a. **Develop education programmes and materials about natural heritage and biodiversity conservation for the national curriculum (higher, secondary and primary schools).**

- b. **Develop teaching modules and teacher's training programmes with the Ministry of Education.**
- c. **Provide training, exchange programmes and grants to university professors in applied fields related to biodiversity/nature conservation.**
- d. **Develop out-reach programmes for schools and universities, such as field trips and mobile units to generate awareness about Egypt's natural heritage.**
- e. **Support existing and new university field stations to provide students with hands on training in applied research on biodiversity conservation.**
- f. **Establish a National Institute for Natural Resource Management at an Egyptian University that would provide undergraduate and postgraduate training in natural resource management, including in wildlife management, protected area management, and the ecological components of environmental impact assessments.**
- g. **Provide support to the Conservation Education Center at the Giza Zoological Garden and the Natural History Museum for Children to strengthen their abilities to conduct education programs about biodiversity and natural heritage conservation.**

Component 4: National Capacity Building Program for the Private Sector

- a. **Conduct workshops and training programmes for business, NGOs and local communities .**
- b. **Establish exchange programmes for business, NGOs and local communities to see other country's experiences.**
- c. **Develop demonstration projects to provide business, NGOs and local communities with hands-on-training experience and establish models in the sustainable and wise use of natural resources.**
- d. **Provide small grants for business, NGO and local community wildlife and habitat conservation initiatives, including for projects related to women and biodiversity.**

4. Scale of implementation:

The programme will be primarily implemented at the national and local levels.

5. Implementation status:

Some components of this project are on-going. Danida has an Environmental Educational Programme with the EEAA. EU is also supporting

Education and Public Awareness Programmes. GEF-Life is providing small grants to NGOs in fields related to biodiversity and regional waters.

6. Main participants:

EEAA, Ministry of Information, Ministry of Education, Ministry of Higher Education.

7. Role of EEAA:

The EEAA will be the leading organization in this project and will coordinate and liaison with other bodies as necessary.

8. Overlaps with other sectors/programmes:

Environmental Education and Public Awareness.

PART 3

Current Status of Implementation of the Provisions of the Convention

Within the limited available resources (both human and financial) Egypt has embarked on the implementation of the Convention with the involvement of all sectors . EEAA is the coordinating agency.

Below is a summary of the current status of implementation of the various provisions of the Convention .

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| Article 6: General measures for conservation and sustainable use |
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Biodiversity Strategy and Action Plan

- **Preparation of a National Biodiversity Strategy and Action Plan:**

According to Article 6 of the Convention, the contracting parties are required to develop national strategies and action plans for the conservation and sustainable use of biological diversity and to integrate them into relevant sectoral or cross-sectoral plans, programmes and policies . Out of a conviction that the process of developing the national strategy and action plan for biodiversity conservation should be a participatory one, a working draft has been prepared for discussion in the first national conference held for this purpose in January, 1997 in Cairo and attended by about 50 national experts representing universities, research centres, ministries and NGOs . The outcome of this conference was taken for further discussion in 15 one-day workshops hosted in different parts of the country and attended by representatives of all sectors of local society including interested individuals . Such extensive discussions proved not only informative and illuminating but also highly reflective of the problems, ideas and needs of local communities in all regions of Egypt . In this way, the EEAA has ensured that all sectors of society should adopt the national strategy and action plan and participate in their implementation. A national conference was held on 26th November, 1997 for the formal adoption of the strategy which was attended by concerned ministers, governors and other officials of local administration, representatives of the private sector and NGOs . The first draft of the strategy is available .

- **Preparation of a National Biosafety framework:**

Egypt is currently implementing programmes related to conservation and sustainable use of terrestrial and aquatic ecosystems and endangered species including the establishment of the Agricultural Genetic Engineering Institute (Ministry of Agriculture and land Reclamation), the Biotechnology Centre (Cairo University) and the development of disease resistant and stress tolerant crop varieties for release and application . It is also recognized that some (Living Modified Organisms) LMOs are now traded internationally as commodities and their transboundary movement into and out of Egypt is inevitable . However, while potential benefits of these developments are well recognized, the relative limited experience with such organisms requires that they should be developed and applied in a precautionary and judicious manner .

Egypt is developing a detailed workplan/timetable , mobilizing expertise, developing common understanding on what is needed to support the preparation of a National Biosafety Framework . It needs to carry out stock-taking and assessment of the state of play in the country on matters related to biosafety through a number of surveys . These include a survey of existing biotechnologies and status of safety in biotechnology application including review and assessment of existing biosafety legislation and guidelines, sectoral manuals, institutional mechanisms and administrative measures . The surveys include also existing national, bilateral and multilateral cooperative programmes in RXD and application of biotechnology . Existing mechanisms for harmonization of risk assessment/risk management, mutual acceptance of data and data validation must be surveyed . Survey of extent and impact of release of LMOs and commercial products is also required .

Article 7: Identification and monitoring of biodiversity

- The documentation and monitoring of natural, threatened ecosystems and habitats as well as of species and populations (i. e. , Habitat Diversity : Egypt, The Egyptian Plant Red Data Book, vol. I Trees and Shrubs, and The Plant Red Data Book of Egypt, 1. woody perennials) , is being carried out on the central governmental level using standard methodology, with a central coordination in the EEAA. National surveys undertaken within the framework of a National Biodiversity Study supported by UNEP are being supplemented by regional mapping at the governorate level . Drafting the guidelines for this process and conducting further, the surveys will be done by scientific societies (Universities, National Research Centers, Research Institutes, to name a few), as well as the cooperation of other public and private research institutions (i.e., Entomological Society, Zoological Society, Zoological and Botanical Gardens) . The collected data are being managed in a form that is accessible to the national biodiversity data base and its network established with UNEP/GEF support. These data are to be updated at regular intervals according to the respective diagnostic and monitoring activities .

- A series on flora and fauna of Egypt will be published.

- Several desert surveys in Egypt have been carried out by different institutions in 26 governorates . These mapping efforts should be consolidated . Any records of changes in the species composition of desert biota will be continuously updated .

- Few orchard areas have only been mapped in some governorates . A nationwide survey under the participation of Ministry of Agriculture, Nature Conservation Department and the private sector . Emphasis will be given on establishing a central nationwide catalogue of varieties and races of fruits which will serve to coordinate ongoing activities in this sector . The plan is to establish a data bank at the Horticulture Research Institute, Ministry of Agriculture .

- In the animal sector, a nationwide data bank for threatened domestic animal races, varieties and breeds would help the survival of an increasing threat to local breeds and to initiate protecting measures .

- The hunting management sector recommends policies, programmes and projects to build the nation's capacities and capabilities . Urgent action is needed to regulate hunting and other forms of wildlife utilization occurring in Egypt. The EEAA, as the body responsible for the protection of the environment, entrusted with overseeing the compliance of law 4/1994 and international environmental conventions, should take a leading role in managing hunting, as well as adopt other steps to improve the utilization of wildlife resources in Egypt.

- Biodiversity in aquatic ecosystems requires surveying and classifying the condition of the various water bodies (River Nile, inland lakes and coastal plains). Suitable approaches include ecological integrity, geomorphological, hydrobiological, hydrological, biocoenotic and fish surveys.

Article 8 : *In- situ* conservation

- The responsibility to establish a system of protected areas or of areas calling for special measures to conserve biodiversity lies with the EEAA . Protected areas are being increased as needed based on a systematic survey of Egypt's biodiversity.

- The national programme embraces the long-term objectives of development of the present 18 protected areas / reserves and surveys for identifying new sites and expanding some of the existing reserves. Prioritization needs to select short-term targets. This is set on ground of : (1) representation of principal ecological setup, and (2) requirements to "save" areas of special interest and areas under threat.

- Among the present 18 reserves there are 7 that are : managed as nature reserves and need to be sustained (the three reserves of the Gulf of Aqaba), with management plan at advanced stage of development (St. Katherine, South Sinai), or with management plan at initial stage of development (Wadi Rayan, Faiyum Governorate), two biosphere (UNESCO) reserves (Omayed-Mediterranean and Wadi Allaqi - Southeast Nubia) are managed as sites of ecological research and monitoring by teams of associated universities.

- The remaining 11 sites, though have minimal infrastructure and staff, require development and subsequent implementation of management plans, recruitment and training of staff. Priority (target for the next five years) will be given to two areas:

- a. The wetland sites of Ashtoom El-Gameel (Lake Manzala) and Zaraneek - Lake Bardaweel (North Sinai) . These wetland sites of international importance are under escalating stress : extensive development of natural gas facilities near Ashtoom El-Gameel site and extensive irrigation-drainage schemes of the Salaam Canal (400 000 acres of land to be reclaimed) in North Sinai.
- b. The Elba Protectorate is an extensive and complex area that may eventually comprise a number of systems : the mangroves of the Red Sea littoral, the Red Sea 22 islands (within the EEZ of Egypt), and the Gebel Elba mountain area. The first two are of scientific and biogeographical interest and are under the intense threat of tourism development. The Gebel Elba is one of the richest sites of natural biodiversity in Egypt, it represents the very special ecological set-up of coastal mist oases and is biogeographically the northeast outmost of the Ethiopian highland biota.

- Within the proposed sites to be surveyed and eventually managed as nature reserves, priority will be assigned to (1) the wetland sites of Lake Borullus, the Qattara-Siwa district of the northern Western Desert and the El-Gelf El-Kebir - Gebel Oweinat district of the southern Western Desert.

- The existing 18 protected areas cover 7.4 % of Egypt total areas. Future nature reserves were identified to increase the area to 15 % by 2005 .

- Guidelines for the selection, establishment and management of protected areas or of areas calling for special measures to conserve biodiversity need to be based on a systematic survey of biodiversity of Egypt. This will require a cooperative effort between EEAA, Governorates, Ministry of Agriculture as well as Universities . Consideration should be given to the principles outlined in Egypt Country Study and Egypt biodiversity data management plan which took place in collaboration with UNEP.

- Cooperation is also called for between EEAA and environmental offices in governorates to work together. This is important for management biological resources that are necessary for conserving biodiversity both within and outside the protected areas, for promoting the protection of ecosystems and natural habitats, as well as for keeping viable populations of species in their natural surroundings.

- The restoration of impacted ecosystems as well as the regeneration or reintroduction of populations of endangered species must occur with support of nature conservation experts. Alien species that present a potential threat to ecosystems, habitats, or species can be controlled by substantive laws (e.g., fishery laws, nature conservation laws). Nature conservation agencies and user groups must work together to eradicate alien species . A famous example is the detrimental effect of the introduction of the water hyacinth (Eichhornia crassipes) on life in the River Nile. A more recent example is the introduction of the water fern Azolla filiculoides to be used as a biological fertilizer in rice fields

but it inadvertently escaped into water courses where it seems to be wiping out a number of other native hydrophytes. Similarly, the introduction of an exotic species of freshwater crabs was introduced in aquaculture basins but it found its way into major water channels where it became a serious pest to commercial fish and to biodiversity in general.

- Governmental laws are being amended to cover at least those species protected under international conservation (i.e., Ramsar, Bon, CITES).

- Farmland biodiversity must be conserved using cultural landscape management and agricultural measures. Private programmes and projects designed to promote biodiversity in governorates (municipal levels) to be integrated into a common strategy in order to optimize their effectiveness.

- Use of pesticide in Egypt has been dramatically reduced but direct effect of fertilizers and pesticides on biodiversity, around rivers, lakes and in refuges, buffer distances still to be designated by law.

- In the animal sector, efforts must be taken for the *in-situ* conservation of wildlife, by the Ministry of Agriculture and land Reclamation. Efforts must be taken to enable future cooperation with NGOs. Sharkia governorate has made valuable contributions in the *in-situ* conservation of the Arabian horse . In the bee sector, the threat to one local Egyptian race has been considered as threatened, a proposed plan to isolate this race and to place it under the auspices of an expert working group in the Ministry of Agriculture.

- The private sector can contribute to the *in-situ* conservation of biodiversity, i.e. establishing and maintaining wetlands and near-natural gardens.

- Egypt is in the process of establishing and maintaining means to regulate, manage or control the risks associated with the use and release of living modified organisms (LMOs) resulting from biotechnology which are likely to have adverse environmental impacts that could affect the conservation and sustainable use of biological diversity, taking also into account the risks to human health (Art. 8 (g)). This will be achieved throughout a national biosafety framework using the UNEP International Technical Guidelines for safety in Biotechnology.

Article 9 : *Ex-situ* conservation

- Threatened species would benefit from condensed efforts at *ex-situ* conservation in botanical and ornamental gardens, zoos as well as gene banks, and deserves more consideration . The strengthening and coordinating of existing gene banks for crop genetic resources is a major problem. The renewal of genetic material, in small available units in the country, especially in case of endangered wild species is a major task. *Ex-situ* conservation efforts must be joined with new data on germination, storage conditions, and necessary replenishment cycles of gene bank material.

- Little attention is given to some forms like vegetable crop and fruit varieties, (i.e., cucurbits) where major gaps in our taxonomic knowledge exist.

- Conserving old varieties and strains in public facilities, university farms, gardens, and on privately owned land needs to be accompanied by a nationwide effort to gather and document this information in a data bank on varieties.

- Likewise, attention must be given to the conservation of sperms and embryos of horses, donkeys, sheep, goats, camels, cows, buffaloes, poultry and fishes.

- Little has been done to preserve collections of microbial strains in Egypt. Increased national and international cooperation is needed to preserve and access such resources.

- It has become necessary, and steps were taken, at present, to establish a central coordinating office for the *ex-situ* and *in-situ* conservation of genetic resources of crop plants and farm animals, with the following functions :

- Secure contacts with all institutions concerned with conservation measurers.
- Keep records of all responsible facilities and persons.
- Exchange of experience between participating parties.
- Guarantee rights of access and use.
- Identify negative trends early enough and raise alarm.
- Create awareness, educate the public and incentives for initiatives.

Article. 10 : Sustainable use of components of biological diversity

- In the agricultural sector it means the protection of natural ecosystems, the conservation of species diversity, as well as landscape and biotope conservation. The sustainable use of agricultural biodiversity needs conserving a certain stock of environmental capital for future generations. This requires coordination between agricultural activities and general environmental policy.

- Many breeding programmes are in place.

Article 11 : Incentive measures

- The EEAA shall jointly with the Ministry of Finance, set up an Incentives System which may offer incentives to the authorities, establishments, individuals, and others who undertake works or projects that protect the environment (Law 4 for the Environment, 1994).

- Generally, evaluation of subsidy programmes in different sectors would help to modify those measures that negatively affect the conservation and

sustainable use of biodiversity . Financial subsidies from the government to promote biodiversity in agriculture, can be designed by cultivation of rare species and varieties . The spectrum of subsidized species and varieties would be expanded to animals, especially threatened breeds of cows, buffaloes, horses, sheep, goats and poultry.

Article 12 : Research and Training

- It is extremely important to adopt a scientific approach which should be based on an inventory of biodiversity in the country. The study and documentation of native biota, along with the degree to which they are threatened or endangered, is being worked out at many Egyptian Institutions and Universities. Special attention should be given to teach taxonomy in university curricula in order to satisfy the demand for taxonomists.

- The main agencies that fund biodiversity research are, the universities, Ministry of Agriculture and Land Reclamation, Ministry of Scientific Research, Ministry of Irrigation and Public Works.

- Education and training in the fisheries sector is regulated nationally in the form of the agricultural law. Advanced training and education in fisheries take place in the Institute of Fisheries and Oceanography (Academy of Scientific Research and Technology). Advanced training courses in fishery management and fish breeding could help promote this approach.

- Research and training in techniques for conservation and sustainable use of microbial, plant and animal genetic resources and relevant biotechnologies and biosafety issues are carried out at a modest scale and need to be strengthened.

Article 13 : Public education and awareness

- The responsibility in the public education sector bears on all institutions dealing with biodiversity . The work, results and goals of all these institutions, must be presented to the public in adequate form. In future, programmes must be presented to the public in adequate form. Future programmes undertaken by EEAA and the Ministry of Agriculture and Land Reclamation to promote biodiversity, will be more effectively presented via television, radio and newspapers.

- Exhibitions provide an optimal public relations forum . Public interest can be stimulated by attractively presenting knowledge on vegetables and ornamental plants in gardens, exhibitions or, zoos . Examples, in Egypt, include the garden show of Agricultural Museum, in Dokki and the Fisheries zoo garden in Zamalek. Market gardens and nurseries run by private sector could educate consumers by providing information with every purchase.

- In future, research and documentation work will be taken to build public awareness for the value of biodiversity.

- Schools, other private educational institutions and NGOs will play an important role in building public awareness and disseminating information on the importance of biodiversity.

Article 14 : Environmental impact assessment

- Studying and analyzing the environmental feasibility of proposed projects, whose construction or activities might affect the safety of the environment, with the aim of protecting environment is mandatory (Law 4 for the Environment, 1994).

- Efforts should be made to amend EIA law to integrate wider aspects of biological diversity . This would allow the impact on biodiversity to be estimated at an early stage and permit appropriate precautionary measures to be addressed and planned. An effort must be made to better incorporate issues raised in the convention on biological diversity.

Article 15 : Access to genetic resources

In Egypt, access to genetic resources is relevant for varieties used in agriculture. Access to wild species with the exception of endangered and threatened protected species, is not restricted. Egypt strategy is to establish a gene bank, whose task is to provide free access to genetic material.

Article 16 : Access to and transfer of technology

A greater effort should be made to transfer green technologies, in particular related biotechnologies, within the framework of aid and development programmes . The private sector, however, plays an important role in this respect.

Article 17 : Exchange of information

- EEAA is the focal point for the UNEP information exchange network Infoterra .

- EEAA, National Biodiversity Unit is also the national contact for the clearing house mechanism, which is currently being established under the CBD.

- Besides, referral collections, main libraries and universities have long-standing agreements on the exchange of publications with partners abroad. For many years, Egypt has cooperated with international, regional or local scientific organizations and foreign universities and research institutes. A greater number of joint international projects and the dissemination of information would be desirable.

- In the field of gene technology / biotechnology / biosafety the Egyptian safety regulations covering the use of genetically modified (engineered) organisms are available to the public through the Ministry of Agriculture and Land Reclamation.

Article 18 : Technological and scientific cooperation

- Egypt will increase efforts to implement international agreements in the fields of species protection and nature conservation. Our scientific contacts with Africa and Eurasia also need to be improved. One important area of cooperation would be migratory birds (African - Eurasian Migratory water bird Agreement).

- Egypt's participation in international programmes to collect and document biodiversity should be intensified and expanded.

- In agriculture, the National Plant Genetic Resources Unit / Egypt (NPGRU/E) was established in 1996, to serve as a permanent, supranational forum for drafting strategies and guidelines to guarantee that plant genetic resources are collected, evaluated and used in nutrition and agriculture, and that these resources are made available for plant breeding and science.

Article 19 : Handling of biotechnology and distribution of its benefits

- Egypt is working seriously to improve the risk assessment criteria for living modified organisms. The implementation of the legally non-binding UNEP Technical Guidelines on Biosafety to conserve biodiversity on an interim basis has received strong support.

- Egypt also supports a legally binding instrument to regulate the transboundary transfer of living modified organisms. Egypt is therefore, actively participating in the negotiations of the “ Biosafety Protocol “. These efforts should be actively pursued.

- At present, Egypt is in the process of preparation of a National Biosafety Framework involving the assessment of : current and potential application of biotechnology, existing administrative measures, relevant legislation and regulations, adequacy of existing human resources and capacity of existing institutions, identification of gaps and priority needs, preparation of a national biosafety framework and action plan, and prioritization of requisite capacity building needs called for in the UNEP Guidelines.

Partners in CBD Implementation

In Egypt, implementation of the Convention is coordinated by the Ministry of State for Environmental Affairs. The Ministry established the National Biodiversity Unit in which representatives of the respective concerned ministries, agencies and authorities can coordinate their activities. The agencies and organizations participating in the NBU include :

**Ministry of Agriculture and Land Reclamation
Egyptian Wildlife Service
Environment Offices in Governorates
Ministry of Scientific Research
Ministry of Education
Egyptian Academy of Science and Technology
Ministry of Foreign Affairs
National Universities
Ministry of Defense
Ministry of Interior**

In the course of preparation for developing a strategy to implement the Convention on Biological Diversity, 15 workshops are hosted in individual governorates and attended by stockholders dealt with the first draft of this document . Participants in these workshops included university scholars, staff of the governorates including agriculture, fisheries, veterinary and education departments, representatives of NGOs and civil groups, etc. The strategy is currently still under discussion. The present report can therefore only indicate the priorities in formulating the strategy and the potential for integrating this work in other plans and strategies.

Annex

**Programme Priority Activities
(1998 - 2003)**

Programme 1 :**Conservation of the Delta-Mediterranean Wetlands.**

This programme aims at establishing and managing three nature reserves in wetlands of international importance (Ramsar-type sites) in: Lake Bardaweel (Zaraneek), North Sinai, Lake Manzala (Ashtoom El Gameel), East Delta, Lake Borullus, Middle Delta.

All are brackish-water lakes with access to the Mediterranean.

Lead Responsible Agency:

Department of Nature Conservation (Ministry of State for the Environment).

Others Directly Involved:

The three governorates of North Sinai, Dakahlia and Kafr el-Sheikh.

Planned to start in 1998

Estimated costs (from external sources), US \$:

| | | |
|---------|-------------------------|------------|
| stage 1 | (1998 - 99) | 3,000,000 |
| stage 2 | (2000 - 2002 | 9,000,000 |
| stage 3 | (per year as from 2002) | 1,500,000 |
| Total | (six years) | 13,500,000 |

Objectives

1. to manage the three lakes on bases of sustainable development of natural resources,
2. to conserve habitat and biota in ample areas of the three lakes, including rehabilitation of damaged habitat types and re-introduction of lost biota,
3. to insure haven-habitat for migratory birds en-route during their seasonal voyages,
4. to provide field sites for research (wetland ecosystems) and monitoring (migratory birds) and education and training.

Stages of Activities

1. In the first stage (two years: 1998 - 99):
 - ecological and socio-economic inventories,
 - design of management schemes for conservation including designation of reserves,
 - design a plan of action and a system for sustainable management of natural resources, including a land-use plan,
 - training of personnel,
 - initiate building up of data base (GIS).
2. In the second stage (three years: 2000 - 02):
 - application of the conservation scheme (define reserve areas, build reserve infrastructures including research and monitoring facilities, etc.),
 - establish a system (with its structures) for sustainable management of fisheries, implement the approved land-use plan,
 - recruit necessary staff,
 - establish mechanisms for participation of stockholders,
3. As from 2003 onward the system of wetland reserves will run as a national network of northern (coastal) wetlands with affiliation and collaboration with regional (Mediterranean) and world (Ramsar) programmes.

Cost estimates (for each of the three sites), in 1000 US \$.

| <u>Stage 1</u> (total \$ 1,000,000 / year) | 1998 | 1999 |
|--|------------|------------|
| • field equipment | 100 | 150 |
| • habitat-biota surveys | 50 | 50 |
| • consultancies | 100 | 100 |
| • training | 30 | 170 |
| • initial data bases | 50 | 100 |
| • operation and contingencies | 50 | 50 |
| Total | 380 | 620 |

| | | | |
|--|----------------|-------------|-------------|
| Stage 2 (total \$ 3,000,000 / year) | 2000 | 2001 | 2002 |
| • buildings | 500 | 750 | |
| • infrastructures | 300 | 500 | |
| • fisheries (management) | | 100 | 150 |
| • bird hunting (management) | | 100 | 150 |
| • data bank (GIS) | | 50 | 50 |
| • operation and contingencies | 50 | 50 | 50 |
| Total | 850 | 1550 | 400 |
| Salaries, etc. in Egyptian Pounds (1000) | 200 | 200 | 200 |
| | | | |
| Stage 3 (per year / site as from 2003 in US \$ (1000) | | | |
| • running expenses (fuel, etc.) | 100 | | |
| • repair, maintenance | 200 | | |
| • consultancies | 100 | | |
| • contingencies | 100 | | |
| Total | 500 | | |
| | | | |
| Salaries in Egyptian Pounds, | 500,000 | | |

Likely external sources of funding:

- 1. share of GEF project: Conservation of Wetland and Coastal Ecosystems in the Mediterranean Region,**
- 2. European Union: showed interest in the north Sinai site of Zaraneek as part of their support to the Sinai natural reserves,**
- 3. METAP**
- 4. funds in Egyptian Pounds to be provided by the Government of Egypt: EEAA, Ministry of State for the Environment.**

Programme 2:**Conservation of Southern Red Sea Coastal Lands of Egypt Including the Elba Highlands.**

This programme aims at establishing and managing systems of biodiversity conservation (and sustainable development of natural reserves) in three principal systems:

1. Red Sea littoral including the mangrove formations, coral reefs, islands and littoral salt marshes,
2. Red Sea coastal plain including wadi systems debauching into the sea,
3. Red Sea coastal mountains including the mist oases formations represented by the Elba highlands with its rich biodiversity and associated indigenous societies.

Lead Responsible Agency:

Department of Nature Conservation (Ministry of State for the Environment).

Others Directly Involved:

The Governorates of the Red Sea.

Planned to start in 1998.

Estimated costs (from external sources), US \$

| | | |
|--------------|-------------------------|-------------------|
| stage 1 | (1998 - 99) | 2,000,000 |
| stage 2 | (2000 - 2002) | 15,000,000 |
| stage 3 | (per year as from 2003) | 3,000,000 |
| Total | (six years) | 20,000,000 |

Objectives:

1. to manage the Red Sea coastal territories of Egypt in ways that resolve conflicts among users, and that set bases of sustainable development of natural resources,
 2. to conserve habitat and biota in ample areas (reserves), to rehabilitate damaged habitat types and to re-introduce lost biota,
 3. to ensure secure (or least hazardous) passage of migratory birds along the highway of the Red Sea, and to sustain the ecological health of this major biogeographic corridor,
 4. to provide field sites for research (various ecosystem types), monitoring biodiversity, and education and training.
-

Stages of Activities

1. In the first stage (two years: 1998 - 99)
 - integration of the results of two projects (the GEF-Red Sea 1994-1998; and the US-AID Mobarak-Gore initiative-coral reefs 1994-1998),and build-up a consolidation base of information on biodiversity of the Egyptian Red Sea coastal territories,
 - design management schemes for conservation of various habitat types (and their biota), identification and designation of nature reserves,
 - design plan of action and a system for sustainable management of natural resources, including a land-use plan that would be acceptable to stockholders, especially those concerned with:

One-tourism and recreation,

Two-fisheries,

Three-mineral resources, industry, energy,

Four-conservation (nature reserves),

Five-infrastructure (roads, airports, ports, settlements, etc.),

Six-life-support systems of indigenous communities
(rangelands, farmlands, etc.).

- training of personnel,
- initiate building of data base (GIS),
- establish mechanisms for participation of stockholders.

2. In the second stage (three years: 2000 - 02)

- establish the institutions (management mechanisms and people organizations, legislation, etc.) capable of management of the scheme and its territories,
- establish a series of nature reserves with the necessary infrastructures in each and systems of management as appropriate,
- recruit necessary staff,

3. As from 2003 onward the system of research will run as a national network of sites with affiliation with other national networks of nature reserves and with collaborative relations (programmes) with nature reserves in the Red Sea basin.

This system of reserves will include sites representing:

- islands,
- coral reefs,
- mangrove formations and associated littoral,
- coastal plain including wadi systems,
- mist oases of the Elba highlands.

Cost estimates for the whole programme in 1000 US \$.

Stage 1 because of the information made available through the two on going projects (GEF - USAID) costs of this stage are less than otherwise.

| | 1988 | 1989 |
|-------------------------------|-------------|-------------|
| • field equipment | 600 | 500 |
| • consultancies | 200 | 200 |
| • training | 100 | 150 |
| • initial data bases | 50 | 50 |
| • operation and contingencies | 50 | 100 |
| Total | 1000 | 1000 |

Stage 2

| | 2000 | 2001 | 2002 |
|--|------|------|------|
|--|------|------|------|

| | | | |
|---|------|------|------|
| • buildings, infrastructures, etc. of nature reserves | | | |
| islands | 750 | 750 | 500 |
| coral reef | 1000 | 1000 | 1000 |
| mangrove and littoral | 750 | 750 | 600 |
| coastal plain | 500 | 200 | 200 |

| | | | |
|-----------------------|--------------|--------------|--------------|
| Elba highlands | 2,000 | 1,500 | 1,500 |
|-----------------------|--------------|--------------|--------------|

| | | | |
|--|--------------|--------------|--------------|
| • consultancies | 200 | 200 | 200 |
| • data bank (GIS) | 300 | 300 | 200 |
| • operation and contingencies | 200 | 200 | 200 |
| Total | 5,700 | 4,900 | 4,400 |
| Salaries, etc. in Egyptian Pounds (1000) | 750 | 750 | 750 |
| | | | |
| Stage 3 (per year / site as from 2003 in US \$ (1000) | | | |
| • running expenses (fuel, etc.) | 1000 | | |
| • repair, maintenance | 1000 | | |
| • consultancies | 600 | | |
| • contingencies | 400 | | |
| Total | 3000 | | |
| Salaries In Egyptian Pounds (1000): | 750 | | |

Likely external sources of funding:

1. GEF: follow up of the GEF-Red Sea project
2. USAID: follow up of ongoing coral reef project
3. World Bank: Red Sea Programme (MENA)
4. funds in Egyptian Pounds (and contributions in kind) to be provided by the Government of Egypt : EEAA, Ministry of State for the Environment.

Programme 3:**Conservation and Sustainable Management of Lake Nasser
(Aswan High Dam).**

This programme aims at establishing a system of management of the large man-made lake of the Aswan High Dam. Lake Nasser is the part of this water body within the Egyptian border (north of Lat. 22°N). Lake Nasser (Egyptian part) and Lake Nubia (Sudanese part) represent the principal water reservoir of Egypt. Conservation will aim at keeping this water body healthy (no pollution), and maintaining its biota (including migratory birds) in natural balance, and monitoring biotic invasions (water weeds, tropical disease vectors, etc.):

Management programme will enforce regulations that ensure the sustainable use of the resources of the Lake. System of management will include mechanisms (institutions) that will implement the necessary operations.

Lead Responsible Agency:

Ministry of State for the Environment.

Others Directly Involved:

Ministry of Public Works and Water Resources, High Dam Authority,
The Governorate of Aswan.

Planned to start in 1998.

Estimated costs (from external sources), US \$

| | | |
|---------|-------------------------|------------|
| stage 1 | (1998 - 99) | 1,000,000 |
| stage 2 | (2000 - 2002) | 10,000,000 |
| stage 3 | (per year as from 2003) | 2,000,000 |
| Total | | 13,000,000 |

Objectives:

1. to establish an environment monitoring network that would monitor (a) water quality, (b) biota in water, (c) biota associated with the water body and its fringes, (d) people associated with the lake (users),
 2. to establish a research facility for carrying out ecological and limnological studies on the water body and its ecotone fringes (with adjoining deserts),
 3. to establish and operate a geographical information system (GIS) for the Lake and adjoining territories,
 4. to establish a mechanism and institutional arrangement of the lake in its totality (the lake and its environment), the purpose is to sustain the environmental health of the Lake.
-

Stages of Activities**Stage 1. (preparatory)**

- review the information available and collected during various programmes of studies (since 1964),
- design management schemes for conservation of various habitat types (and their biota), identification and designation of nature reserves,
- design the units of the monitoring network:
 - One-location,
 - Two-equipment,
 - Three-programmes,
- consultations with stockholders on management and institutional arrangements;
- initiate building of data base (GIS),
- establish mechanisms for participation of stockholders.

Stage 2. (action)

- establishment of monitoring network and research facility, (rehabilitation of the existing research centre)
- data bank (GIS),
- training of manpower,
- establishment of the necessary institutions.

Stage 3. first year in operation

Cost estimates (x 1000 US \$)

| | | | |
|--|--------------|-----------------------|--------------|
| <u>Stage 1</u> | 1998 | 1999 | |
| • consultancies - contracts | 400 | 100 | |
| • workshops | | 200 | |
| • field work | 100 | 100 | |
| • operation and contingencies | 50 | 50 | |
| Total | 550 | 450 | |
| | | | |
| Stage 2 | 2000 | 2001 | 2002 |
| • buildings, | 1,000 | 2,000 | 2,000 |
| • equipment | 500 | 1,500 | 1,000 |
| • GIS | | 500 | |
| • training | 750 | 500 | 250 |
| Total | 2,250 | 4,500 | 3,250 |
| | | | |
| Stage 3 | | 2003 | |
| • monitoring | | 750 | |
| • research | | 1,000 | |
| • data processing | | 100 | |
| • running expenses | | 150 | |
| Total | | 2,000 (yearly) | |
| | | | |
| Salaries In Egyptian Pounds not included. | | | |

Likely external sources of funding:

1. UNESCO - FAO - UNEP : technical assistance
2. GEF - World Bank:
3. Bilateral aid

Programme 4:**Egyptian Genetic Resources**

This programme aims at establishing and managing three national institutions:

- Natural History Museum,
- Gene Bank,
- Captive Breeding Centre.

Lead Responsible Agency:

Ministry of State for Science (Natural History Museum),
Ministry of Agriculture (Gene Bank, Captive Breeding Centre).

Others Directly Involved:

Ministry of State for the Environment.

Planned to start in 1998.

Estimated costs (from external sources), US \$ 1000

| | |
|-----------------------------|--------------------|
| The Natural History Museum | 100,000,000 |
| The Gene Bank | 11,000,000 |
| The Captive Breeding Centre | 16,000,000 |

| | |
|--------------|--------------------|
| Total | 127,000,000 |
|--------------|--------------------|

| | | |
|--------------|-------------------------|--------------------|
| stage 1 | (1998 - 99) | 5,000,000 |
| stage 2 | (2000 - 2002) | 110,000,000 |
| stage 3 | (per year as from 2003) | 12,000,000 |
| Total | six years | 127,000,000 |

Objectives:

1. The Egyptian Natural History Museum will have the main function of housing complete referral collections of the taxonomic groups of the biota of Egypt. In support of this function, it will perform the following functions:
 - a. surveys and inventories of biodiversity,
 - b. build up and manage the national network of biodiversity data,
 - c. training of taxonomists and curators,
 - d. training of specialists in management of data banks,
 - e. supporting programmes of education and dissemination of biodiversity information.

2. Function of the National Gene Bank will include:
 - a. collection and maintenance of genetic resources with special emphasis on races, wild relatives of crop and fodder plants, poultry and farm animals,
 - b. preservation of genetic materials in laboratory (*in vitro*), in fields of the Gene Bank (*ex situ*) and in their natural habitats (*in situ*),
 - c. preservation of genetic materials of micro-organisms,
 - d. research programmes in relevant aspects of bio-technology.

3. The Captive Breeding Centre will have the following principal functions:
 - a. *ex situ* conservation, breeding and husbandry of rare and endangered species of plants and animals,
 - b. ecological and physiological studies on these species, including reproductive processes,
 - c. programmes of re-introduction of these species into their natural habitats, especially in nature reserves,
 - d. support education in schools and out-of schools,
 - e. support research and university postgraduate studies.

Stages of Activities

Stage 1. (1998) Architectural and management designs of the three institutes.

Stage 2. (1999 - 2002)

- a. Building the institutes,
- b. Programmes of training and manpower building,
- c. Initial phases of collection of materials, etc.

Stage 3. (2003 onwards) Functioning of the three institutes, their networks of affiliated units.

Cost estimates US \$ 1000

1. Natural History Museum

| | |
|-------------------------------|----------------|
| • Land | 40,000 |
| • Buildings | 38,000 |
| • Furniture - equipment | 17,000 |
| • Training - manpower | 5,000 |
| • Operation and contingencies | 1,000 |
| Total | 101,000 |

2. Gene Bank

| | |
|--|---------------|
| • Land (provided by Ministry of Agriculture) | |
| • Buildings | 2,000 |
| • Equipment, etc. | 5,000 |
| • Library | 2,000 |
| • Training | 1,500 |
| • Operation and contingencies | 500 |
| Total | 11,000 |

3. Captive Breeding Centre

| | |
|---|---------------|
| • Land (provided in Wadi Rayan Reserve) | |
| • Buildings and infrastructures | 10,000 |
| • Equipment, etc. | 3000 |
| • Training (manpower) | 1,000 |
| • Library | 1,000 |
| • operation and contingencies | 500 |
| Total | 15,500 |

Salaries In Egyptian Pounds not included.

Likely external sources of funding:

- 1. UNESCO - FAO -: technical assistance**
- 2. Japan aid programme showed interest to support the Natural History Museum.**
- 3. GEF**
- 4. Other bilateral aid**

Programme 5:**Capacity Building for Conservation and Sustainable Use of Biodiversity in Egypt**

The Department of Nature Conservation of the Ministry of State for the Environment is the principal instrument for coordination of the implementation of the NSAPBC. Implementation of the various components of the Strategy and Action Plan will be the responsibility of various sectors. To do this effectively it needs to be restructured and developed and be provided with trained manpower and technical and operational facilities that would enable it to carry the following functions:

- a. be the focal point for managing the national network of nature reserves (of all categories),
- b. be the parent body of the national biodiversity unit (NBU) that carries out inventories of Egyptian biodiversity including surveys of habitat types (nomination of nature reserves) and species diversity (feeding referral collection and biodiversity data),
- c. be the institution for providing technical assistance and support to provincial affiliates of the Egyptian Natural History Museum, Egyptian Gene Bank, National Captive Breeding Centre,
- d. be the institution for providing technical assistance and support to the biodiversity education network of Science Gardens and Education Field Stations,
- e. be the focal point for overseeing the enforcement of national laws concerned with protection of biodiversity, and the national focal point for ensuring compliance with requirements of international conventions concerned with conservation of biodiversity.

Lead Coordinating Agency:

Ministry of State for the Environment - Egyptian Environmental Affairs Agency (EEAA)

Others Directly Involved:

Governorates, Ministry of Education, Universities, Research Centres, Ministry of Agriculture, etc.

Planned to start in 1998.

Single Stage : 1998 - 1999 (two years).

Objectives:

1. To implement:
 - a. National Programme for Manpower Development,
 - b. National Programme for Research and Monitoring,
 - c. National Network of biodiversity Data,
 - d. National Programme for Education and .
 - e. supporting programmes of education and dissemination of biodiversity information.
2. To build-up the technical capabilities (equipment, electronic networks, trained personnel) of the Department of Nature Conservation and its associate units and institutions.
3. To establish a functional mechanism for the relationships of mutual support between the Department and the non-governmental organizations (NGOs) and civil society bodies, and between the Departments and government bodies concerned with conservation of biodiversity.

Activities and cost estimates (x 1000 US \$)

| | |
|---------------------------------------|-------------|
| 1. Manpower Development Programme | 1000 |
| 2. Research and monitoring programme | 2000 |
| 3. Data network | 1000 |
| 4. Education and awareness programme | 1000 |
| 5. Technical capability of Department | 1500 |
| 6. National mechanisms | 500 |
| Total | 7000 |

Salaries to be paid in Egyptian pounds not included. Yearly operational cost, as from 2000 onward, is US \$ (equipment) 2,000,000

Likely external sources of funding:

1. UNESCO - UNEP - CBD Secretariat, technical assistance
2. GEF - UNDP
3. Other bilateral aid

Programme 6:**Preparation and implementation of National Biotechnology/Biosafety Frameworks**

Biotechnology will contribute substantively to the improvement of agriculture, fisheries, health and environment in Egypt. However, today there is no national biotechnology policy or biosafety framework irrespective of the fact that living modified organisms (LMOs) and other biotechnology products are being developed and commercialized in Egypt. LMOs are also traded internationally and their movement into and out of Egypt is inevitable.

Objectives:

To promote safe development and application of biotechnology for conservation and sustainable use of genetic diversity.

Stages of Activities:

1. Stock taking and assessment of existing biotechnologies and state of safety in their application.
 2. Identification and analysis of options for biotechnology applications and implementation of biosafety frameworks.
 3. Preparation of national biotechnology policy and biosafety frameworks.
 4. Implementation of priority activities and information exchange requirements.
-

Lead agencies:

- Ministry of Agriculture and Ministry of Environment. Planned to start in 1998.

Estimated cost:

US \$4,000,000.

Likely sources of funding:

1. GEF
2. USAID
3. Other bilateral aid