

Syrian Arab Republic  
Ministry of Environment

Global Environmental Facility  
*GEF*

United Nation Development Program  
*UNDP*

Biodiversity Strategy and Action Plan Project  
SYR/97/G31

GEF Project Implemented by UNDP

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**SYRIAN ARAB REPUBLIC**  
**Ministry of Environment**  
**National Biodiversity Unit (NBU)**

**United Nation Development Program**  
**Global Environment Facility**

# Biological Diversity *National Report*

*Biodiversity Strategy and Action Plan  
and Report to the Conference of the Parties  
NBSAP Project SY/97/G31*

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## ***Preface:***

Under article 26 of the CBD, all parties are required to submit periodic progress reports covering the measures they are taking to implement the Convention and the effectiveness of such measures. In governing Decision II/17, the CBD body (Conference of the Parties) decided that the focus of the first set of national reports should be on implementation of article (6) which obligates parties to develop National Biodiversity Strategies and Action Plans (NBSAP) and to incorporate biodiversity into sectoral and cross-sectoral plans/programs policies.

The COP has provided some general guidelines (Decision II/17) for the contents of the first national reports, including:

- 1- **Scope:** The first national reports are to focus in so far as possible on measures taken to implement CBD Article 6.
- 2- **Goals and Objectives:** Determine “the specific targets to meet the local, national and international goals in terms of protecting, assessing, utilizing and benefiting from biodiversity and its components” (Section d of Annex to II/17).
- 3- **Schedule Section:** Present a timetable for implementation of the various tasks reflecting the priorities that have been assigned with sign posts to help signal progress or delay (“section h II/17”)
- 4- **Monitoring and Evaluation :** Give indicators that will be used “for tracking the results of the Biodiversity Action Plan and for Monitoring Changes in economy, environment and society” Also present the individuals and organizations who will carry out these responsibilities (Section II/17).

## ***EXECUTIVE SUMMARY***

The Syrian Arab Republic has signed and ratified the CBD in February 1995. A country study on Biodiversity was compiled in cooperation with UNEP. The Arabic version of the country study was published and distributed in 1998. The English version is being printed. Begin of 1999 the National Biodiversity Unit, which is a part of the Ministry of State for Environmental Affairs, cooperated with UNDP / GEF to develop a NBSAP.

The causes of Biodiversity loss in Syria can be summarized in the growth of the population and the strife for agricultural, industrial and urbanization development. This is affecting the ecological balance of arid and semi-arid systems to the point of desertification and biodiversity loss.

The National Biodiversity Unit (NBU) is the executing department in the Ministry of State for Environmental affairs for NBSAP. The Steering Committee on Biodiversity comprises all stakeholders of Biodiversity (34) in the country. This includes (12) ministries, (4) universities and (2) research centers, (5) community-based organizations and (2) NGO. The dialogue on the national options for the conservation of biodiversity and sustainable use of biological resources included three national workshops, each with about one hundred participants. There were three regional seminars in different parts of the country, each including about thirty participants representing the sectors of agriculture, forestry, rangelands, irrigation, environment and local administration. Five sectoral meetings were held with representatives of different community based organizations from all over the country to discuss the problem of biodiversity loss and the available options for conservation and sustainable use. The recommendations of all these meetings were taken in consideration in the NBSAP.

A NBSAP is nationally agreed upon and it will be soon submitted to the Supreme Council for Environmental Safety, which is headed by the Minister President and has 12 minister members, to be adopted and incorporated in national planning.

Syria is committed to the protection of its environment. A Minister of State was appointed in 1979. In 1991, a Presidential Decree established the General Commission for Environmental Affairs (GCEA), the Supreme Council for Environmental Safety and the preparation of a draft Environmental Protection Act.

The Syrian Arab Republic signed the Convention to Combat Desertification in October 1993 and ratified this convention in 1997 together with the Ramsar Convention on Wetland. The Syrian Arab republic ratified the Convention on Biodiversity in October 1995. Barcelona Convention was ratified on 20/5/1987, and the MARBOL Marine pollution treaty was ratified on 13.6.1988. The Vienna Ozone Treaty was adopted on 28.5.1991 at the same time the Basel agreement was also adopted.

A comprehensive environmental law is approved by The Supreme Council of the Environmental Safety and is being ratified for the country. Decree no. 7 dated 1.6.1994 issued by the President of the Republic is related to forest protection, its proper management and the establishment of forest reserves. Decree no. 152 dated 23.6.1970 issued by the President of the Republic concerns the organization of wild animal hunting. Ministerial Declaration no. 41 dated 23.10.1994 issued by the Minister of Agriculture and Agrarian Reform prohibits hunting of wild animals all over Syria for ten consecutive year's period. Decree no. 30 dated 25.8.1964 is related to the Protection of marine and fresh water organisms and organizing the fisheries.

The Ministry of Agriculture and Agrarian Reform has convened a Supreme Council on Biodiversity and Genetic Resources and is executing a regional GEF project for the conservation and sustainable use of agrobiodiversity.

Syria does have the institutional and human resources necessary for biodiversity conservation and sustainable use of biological resources. Syria needs much training to upgrade its capacities for *in situ* and *ex situ* conservation. There are urgent needs for information and information management facilities. A national protected areas net to cover different ecosystems is a priority. The need for a national biodiversity museum, a national botanic garden is clear. There is a big need for upgrading public awareness, education and research on biodiversity.

## ***1-Introduction:***

Syria is located at the eastern side of the Mediterranean Sea, in the north Turkey borders it, in the east Iraq, in the south Jordan and Palestine. The coordinates of its geographic position are 32° to 37° N and 35° to 42°E. The total area is 185.2 thousand km<sup>2</sup>. It has a coastline 183-km long the Mediterranean. Syria has two mountain chains parallel to the seashore, with a rift in between, which is an extension of the Red Sea. There are other mountains in the interior of the country, but the main area is a plateau more than 500 m.a.s.l. The Euphrates River, Orontes and Tigris are part of the Syrian territory but they spring and mouth in the sea in neighboring countries.

About 55% of Syria are a dry steppe or semi-desert, which is only suitable for grazing sheep and goats. Dry farming of cereals, food and feed legumes is the backbone of agriculture in Syria. Irrigated land is about 16% of arable land, which are about 6% of the total area of the country. Irrigation water is mainly pumped from wells while the remainder is river and spring water.

The population of Syria is more than 17 million. It is increasing at an annual rate of about 3.5%. More than half of the population is less than 15 years old. The average number of family members is more than six. About half the population lives in the main cities, while the other half lives in the countryside. At present, illiteracy is about 20%, though illiteracy among women is 30.6%. Only 10% of women are working, the rest are housewives or dependent.

Syria has limited water resources, since only 25% of its area receives more than 500mm/year precipitation, 25% of the area receives 250-500mm/year and 50% of the area receives less than 250 mm/year. Precipitation is the main source of water for the country (55%), while the rivers and springs afford 40% and the rest is from flashfloods and wells. About 73.9% of the water resources is used in irrigation, 20% is used in industry and 4% in household.

The present drought wave is affecting biodiversity and life in general in Syria. Last year as well as this year the amount of precipitation is far less than any expected average.

## ***B-Status of Biodiversity and Trends:***

The Syrian Arab Republic (Syria) is a unique country in its geography, topography, and demography. A long strip at the Mediterranean hosts coastal and marine life, typical of the eastern Mediterranean basin. High mountains are excellent habitats for animals and plants requiring milder summer climates and the inland dry areas of plateau, hills and mountains host the desert types of life.

Syria has a human population of over 16 million that is growing at a rate of 3.6 per annum directly or indirectly affects most environmental threats in Syria. In an effort to cater to the needs of its expanding population, Syria implemented ambitious plans to increase its agricultural output, which resulted in an increase of desertification, particularly in the fragile arid region of the Badia.

Syria is almost all dry land and erratic rainfall adds to the difficulties of plants and animals in surviving the harsh habitats. Natural calamities add to the man-made factors and may require immediate actions towards conservation and sustainable use.

Expansion of buildings and infrastructure construction is impinging on the remaining mountain and coastal forest sites. Many of those sites are now threatened particularly the ancient forest ecosystems that are home to cedars, firs, pines and oaks, as well as the wild relatives of domestic fruit trees- as almonds, plums and pears.

About 500 plant species are threatened, of which 250 are believed to be endemic (table 1).

About 354 bird species have been recorded in Syria, of which between 161-194 species breed in the country and 156 are migratory, either passing through or wintering. At least 21 bird species are considered threatened (11 globally and 10 regionally). This number may prove to be much higher once serious ornithological studies are initiated in Syria to survey this major flyway of the Western Palearctic and a critical resting stop for migrating birds particularly the birds of prey.

**Table-1- Syrian biodiversity status**

<b>N</b>	<b>TAXON</b>	<b>Number of authentic species in Syria</b>	<b>Number of species in the World</b>	<b>Percentage in Syria</b>
1-	Fungi	641	46983	1.36%
2	Bacteria	55	26900	1.47%
3-	Algae	754	30600	2.4%
4-	Gymnosperms	10	750	1.33%
5-	Angiosperms	3100	220000	1.4%
6-	Insects	1500	75100	0.1%
7-	Fish	452	19056	2.37%
8-	Amphibians	16	4184	0.38%
9	Reptiles	127	6300	2.01%
10	Birds	360	9040	3.98%
11-	Mammals	125	4000	3.12%

The large mammals of Syria suffered more than any other group of animals through loss of habitat, competition from grazing sheep and goats, and uncontrolled hunting.

Early Arab and Western travelers in Syria, during the 18th and 19th centuries, and until the early part of 20th century, were still reporting on extensive herds of Reem gazelle, Syrian onager and Arabian ostrich. Those observers also told of seeing cheetahs and leopards that depended on the abundance of gazelles and onagers as their primary source of food. Today those herds of gazelle, onagers and ostrich are entirely gone from the Syrian Badia.

Syria has very few protected areas in the form of parks or natural reserves, and hence one of the lowest percentages of protected areas to total land area of any country in the Mediterranean region. According to Syrian statistics the percentage is 0.6%.

### ***B.1. The Flora:***

The vascular flora of Syria includes (22) species of *Pteridophytes* restricted in their distribution to wet, moist and cool areas, that is why the majority of these species are endangered because of the expansion of agriculture to these areas. There are (12) species of *Gymnosperms* which are all endangered because they suffer from the destruction of forests for agricultural aims, grazing and burning forests and the expansion of settlement areas to natural forest remnants, especially in the mountains. There are 3100 *Angiosperm* species in Syria, out of which 243 species are endemic or 7.8% of the total. The distribution of these endemics shows concentration on mountain areas like Hermon, Antilebanon, and the mountains in the Syrian Desert. Unfortunately most of the sites of endemic species concentration are affected by overgrazing which endangers the existence of these species.

### ***B.2. The Fauna:***

There are 2500 species of animals in Syria, 62% of which are insects, 15% are birds, 6% are reptiles and amphibians, 5% are mammals and the remaining are primarily non-insect invertebrates and micro-organisms.

A checklist of insect species includes 1434 species in Syria. Useful insects like the honeybee and silk worm are part of it. The importance of insects in pollination and fruit setting is realized. At the same time harmful insects for agricultural crops are described in the country study. Biological control of pests and diseases is detailed with the experience of the Ministry of agriculture and Agrarian Reform in this field. The threats and dangers, which affect insects, are treated, with special emphasis on biological balance and its importance in sustainable agriculture.

The vertebrates are the most prominent part of the fauna of the country. The amphibians (16), turtles (9), reptiles (70) and snakes (48) are an important element in the natural ecosystems. Many of these species are endangered or threatened, some are even extinct. Especially endemic species of this group need protection and rehabilitation of their habitat. There are special recommendations concerning the conservation of these animals.

Of the mammals, Syria has 125 species recorded on its territory, though most of these records are outdated and there is an urgent need to confirm these records. Of these 24 are Carnivorous, 7 are Insectivorous, 25 are *Chiropterae*, 42 are rodents, 21 are *Arthiodactyla*, 4 are *Pertissodactyla* and one is *Lagomorpha*. It is a fact that most of these animals are present in reduced populations as a result of agricultural and other human activities, except the rodents which form in many cases a pest to the crops and to settlement areas. The almost total absence of preying birds and reduced number of carnivores can explain this.

Domestic animals and their local breeds, Shami cattle, Shami goat and Awasi sheep are typical endemic breeds, which deserve conservation and protection from genetic pollution.

The Ministry of Agriculture and Agrarian Reform is aware of this need; the populations of these breeds are declining as a result of export to neighboring countries and the crossing with improved breeds. The Arab Center for the Studies of Arid Zones and Dry Lands has put some efforts to preserve the Shami goat and Awasi sheep. Other important livestock is the Arabian camel, the Syrian mountain goat, the Arabian horse, the Syrian ass and local breeds of poultry, gees & ducks.

The Syrian honeybee and local breeds of silk worm are also important in this regard.

The Syrian coast of the Mediterranean and its ecosystems and marine life forms constitute a wealth of various species; fish (340) species, sea turtles (4) and sea mammals (11).

### ***B.3. Grazing:***

The Badia once provided the major feed requirements for five million sheep, and now it only provides 20-25% of their feed.

The Badia produces two thirds of all red meat production in Syria and one third of all milk. However, despite the efforts and programs of the Ministry of Agriculture and Agrarian Reform- such as forage banks, storage facilities, surface dams, plus planting shrubs over millions of hectares- the plant cover of the Badia continues to deteriorate. Over 40 million shrubs are pulled out annually for firewood and other uses.

The most obvious loss to the Biodiversity of the Syrian Badia is to be seen in the disappearance of the large mammals. This region was for hundreds of years the richest area in the Arab region with its gazelles, onagers, wolves, and other mammals. Some of these wild animals persisted until the middle of the early 1950s, at which time uncontrolled mechanized hunting and overgrazing eliminated them all in few short decades.

#### ***B.4. Afforestation:***

Afforestation started in Syria in 1953 with the aim of restoring the area of natural forest to its formal size. Afforestation began modestly but it accelerated by the establishment of the Higher Council of Afforestation in 1977 with an agenda of planting 12 thousand hectares per year. In 1984, the President of the country ordered to double these efforts to reach 24 thousands hectares per year, with activities in each part of the country.

Afforestation area in 1997 is about 200 thousands hectares or 1.06% of the total area of the country, compared with (233 thousands hectares) of natural forest or 1.26% of the area of the country.

Trees species of local and exotic origin were used, but during the last years, more attention is given to indigenous material.

The plan is to provide the necessary resources for:

- 0 990 sq. km for the green belt project in central Syria
- 1 2.230 sq. km for the fruit bearing trees project.
- 2 430 sq. km for the project to upgrade fruit bearing trees.
- 3 280 sq. km for the development of southern region.

#### ***B. 5 . Agriculture:***

The total land area of Syria is 185.180 sq. km. According to the 1997 statistics of the Central Office for Statistics in Damascus, the land-use pattern is as follows:

- 4 Agricultural land covers about 59.860 sq. km or 32.2% of the total area.
- 5 Rangelands cover about 82.329 sq. km or 44.7% of the total area.
- 6 Forests cover about 5.210 sq. km or 2.8% of the total area.
- 7 Marginal lands cover the remaining 37.790 sq. km or 20.3%.

The total agricultural crop production figures for 1997 are:

- 8 4.318 million tons of grain.
- 9 2.249 million tons of agricultural raw products for industry.
- 10 2.118 million tons of fruits.
- 11 1.920 million tons of vegetables.
- 12 183 thousand tons of pulses.

These statistics represent a four-fold increase in agricultural products within a period of two decades. This increase in production was in many cases at the account of the fragile ecosystems and low yielding local races of plants and animals (table 2).

**Table- 2- Agriculture Biodiversity of Syria**

	<b>Specie</b>	<i>Area Ha</i>	<i>Yield 1000T</i>	<b># of reported varieties</b>
<b>Field crop</b>	Wheat	1350 000		v. high
	Barley	15000 000		v. high
	Maize	70 000		few
	Lentils	132 000		few
	Chickpeas	49 000		few
	Fababeans	8 000		few
	Sesame	4 000		
	Carthamus			
	Sunflower	9 000		few
	Peanuts	2 000		few
<b>Fruit trees</b>	Apples	30 000	270 000	8
	Pears	13 000	22 000	8
	Apricots	2 500	65 500	11
	Cherries	8 900	32 700	numerous
	Almonds	21 400	37 000	4
	Pistachios	56 000		6
	Walnuts	4 300	2200	few
	Grapes	67 000	37 100	100
	Quince	900	5 700	4
	Citrus	24 700	618 000	9
	Olives	402 000		13
	Figs	10 700	43 300	33
	Pomegranate	6 600	62 000	20
	<b>Industrial crops</b>	Cotton	20 500	645 900
Cannabis		decreasing		
Lin Tobacco		17 800	23 600	8
<b>Forage crops</b>	Lathyrus	22 200	7600	27
	Vetch	12 200	8 300	
	Peas	200	300	
	Berseem	300	10 300	
	Alflafa	3 400	110 400	23
<b>Micro organisms</b>	Viruses			27
	Bacteria			60
	Fungi			641

### ***3rd. Causes of Biodiversity Loss:***

Syria is a self-sufficient country in major food producing crops and animals. The Syrian Government invests a substantial part of its development budget in agriculture.

The Shami breeds of cattle, sheep and goats are very popular. Awasi sheep (fat tail) are popular for meat quality and drought conditions. Shami goats are excellent milk producers and less harmful to forest and pasture plants. Arabian horses are received with interest and care. Local types of assess, rabbits, turkey, geese, ducks, bees, and silk worm are not competitive with the introduced uniform, high yield varieties and races.

There are large numbers of varieties for various field crops, fruit trees, forages, and industrial crops. The most popular varieties are those that are introduced and are highly competitive for the largest share in economy and the higher risk of replacing the traditional.

The Syrian ecosystems have tolerated numerous man-made and natural pressures causing known and unknown losses in biological diversity. Wind erosion degraded 1620 thousand hectares; water erosion degraded 1058 thousand hectares. Desertification encroached on 480000 hectares and salting of irrigated land, mainly in the Euphrates basin, is spoiling 125000 hectares. Between the year 1993 and 1997, 2877 fires were recorded and the area affected was 19957 hectares.

Flooding covered an area of 85000 hectares in the provinces of Ghab, Rouge, Kneitra, Tartous and Lattakia. A large proportion of territory is subject to desertification pressure, especially in the arid part, which is estimated at 60% of the country .

Human activities of direct and indirect influence on the environment and biodiversity are numerous. A huge trees and shrubs are pulled out or cut every year for firewood. Forest land number was reduced 200 thousand hectares by the year 1993. Urbanization has expanded major cities and other public services to cover fertile land around. Rural migration left poor skills at home and increased urban demands in big cities. Well drilling has changed the moisture status and the contribution of underground aquifers to ecosystem stability. Agricultural land was expanded to marginal areas including the highly fragile ecosystem of steppe land (Badia).

The mineral industry (stone and sand extraction) has damaged the natural habitat of living organisms. Chemical industry waters (solid and liquid), municipal water and agro-chemicals have permanent negative contributions to changes in habitat quality, resulting in acute reactions of the prevailing flora and fauna.

Freshwater biodiversity in Syria is subjected to pollution from sewage, industrial waste, oil and agricultural fertilizers and pesticides. There is a rise in the level of dissolved salt from surrounding reclaimed lands, and fishing during the breeding season are practiced.

Marine biodiversity of the Syrian coast faces uncontrolled fishing. Seawater is subjected to oil pollutants from the discharge of ballast water from oil tankers near the coast. Untreated sewage from coastal cities is dumped directly into the sea. Removal of sand from the shore causes loss of natural marine habitats.

The Badia was subjected to uncontrolled grazing and plowing with mechanized tractors. The harvest of woody shrubs for firewood and long periods of drought resulted in desertification.

### ***D- Participation in Biodiversity Planing:***

During the development of the Country Study on Biodiversity, which was carried out in cooperation with UNEP it was necessary to have the participation and contribution of all national stockholders of Biodiversity. This is also the case during the development of the NBSAP. The best form for participation was to involve these STAKEHOLDERS in the Steering Committee on Biodiversity.

#### ***D- 1-Supreme Council on Environmental Safety:***

This is the highest national authority concerned with environment in general and biodiversity. The Council is headed by the Prime Minister and comprises 12 ministers as members. It convenes as necessary according to a call by the Minister President.

#### ***D- 2-General Commission for Environmental Affairs (GCEA):***

GCEA is governed by the Minister of Environmental Affairs and is responsible for the coordination among different ministries in all matters concerning the environment. GCEA has the authority to prepare draft laws, decrees and regulations to be passed by the Supreme Council on Environmental Safety. The functions of GCEA are:

- 1- Study different environmental problems and propose the suitable solutions.
- 2- Preparations of plans and legislation for environmental safety.
- 3- Upgrading public awareness, evaluation of standards for the use of natural resources and the development of standards and criteria for environmental protection.
- 4- Management of environmental problems in soil, water and air, and the control of industrial institutions dealing with dangerous products which may affect public safety.

- 5- Study international conventions and agreements concerning the environment and submitting the necessary advise to the Government.

### ***D- 3-Ministry of State for Environmental affairs (MSE)***

The MSE is the lead Ministry in the Government on all matters related to the Environment. The MSE is in charge of policy formulation, inter-sector coordination, regulatory, and research functions.

The National Biodiversity Unit, situated in the MSE, was established in 1996 to take responsibility for the preparation of the Biodiversity Country Study, which was financed by UNEP. This NBU is expected to play an important role in the development of a comprehensive system of protected areas in Syria.

The Consultative Technical Committee (CTC) is the MSE's primary mechanism for inter-ministerial and public consultation on environmental policies. The CTC is made of members from different stakeholders of biodiversity (34).

In addition to the CTC, there are nine other Environment Committees, which are working as inter-sector bodies, charged with resolving specific environmental issues.

The Ministry includes the following departments:

1. Department of Biodiversity and Protected Areas.
2. Department of Air Safety.
3. Department of Soil and Agriculture Safety.
4. Department of Information and Public Awareness.
5. Department of Ozone Layer.
6. Department of Chemical Safety.

The Ministry has five Directorates and seven Departments covering all the Governorates of the country.

The Ministry of Environment, under the direction of the Minister of State for Environmental Affairs is a ministry that has the direction and authority to transcend across all the operating ministries in order to fulfil its mandate. The Minister has the power to prepare laws, orders and regulations relevant to addressing the country's environmental problems. This is achieved through the Supreme Council for Environmental Safety, which is comprised of (12) ministries and headed by the Prime Minister. The mandate of the Ministry covers the following functions:

1. Define environmental problems and prepare their solutions.
2. To prepare draft plans and legislation for the protection of the environment.
3. To raise public awareness, evaluate the risks of exploiting natural resources and establish standards for the protection of the environment.

4. To monitor environmental problems of soil, water and air, as well as dangerous industrial establishments, which may affect the safety of the national environment.
5. To study international agreements on environmental affairs and provide recommendations to the Government.

***National Biodiversity Unit (NBU):***

On January the 2<sup>nd</sup>, 1995, the Biodiversity Unit was initiated. A National Coordinator was nominated and the Unit was established at the GCEA. This included a secretary with appropriate management support for correspondence and finance and two national consultants: one on plant biodiversity and the other on animal biodiversity.

The NBU with the coordinator and the Minister of State for Environmental affairs form the Management Committee on Biodiversity.

A special Scientific Steering advisory Committee on Biodiversity was nominated including representatives from all stakeholders of Biodiversity in the country: The universities (4), Research Centers (3) and concerned ministries (4): The Ministry of Environmental Affairs, Higher Education, Agriculture and Agrarian Reform and the Ministry of Planning. There are 34 members in this committee including community based organizations, NGOs, regional and international organizations working in Syria.

In addition to the CTC, there are nine other Environment Committees, which are working as inter-sectoral bodies, charged with resolving specific environmental issues.

**The National Biodiversity Unit** took in 1996 the responsibility for the preparation of the Biodiversity Country Study, which was financed by UNEP. A preliminary data bank on biodiversity was established and awaits upgrading. It was also the national executing body of NBSAP. This Unit is expected to play an important role in the development of a comprehensive system of protected areas in Syria.

The Consultative Technical Committee (CTC) is the MSE's primary mechanism for inter-ministerial and public consultation on environmental policies. The CTC is made of members from different stakeholders of biodiversity (34).

***D- 4 - The Ministry of Agriculture:***

The Ministry of Agriculture and Agrarian Reform (MAAR) has the highest number of employees working on Biodiversity. The MAAR has Forestry and Afforestation Directorate that is responsible for protected areas on forest lands. This Directorate collaborated with the Biodiversity Unit at the Ministry of State for Environmental Affairs in the execution of Biodiversity Country Study. In addition to the Protection

Division, there are three other divisions in the Forestry Directorate; namely Utilization, Silviculture and Production Divisions.

The Ministry carries out the following:

1. A plant gene bank comprising 8750 accessions, mainly of wheat, barley, lentils, vegetables and different food and feed legumes. There are 4 graduates and 2 technicians working on them.
2. Live collections (15) of different local clones of fruit trees are distributed in different regions of the country. These include improved commercial varieties. Also each field has at least 3 staff graduates and 2 technicians.
3. Agricultural Research Directorate has a herbarium of about 3000 specimens. Two graduates working as staff manage the herbarium.
4. The steppe Directorate in MAAR has 28 rangeland protected areas; each has an average area of 3000 ha. Each protected area has at least one graduate staff and two technicians.
5. The Forestry and Afforestation Directorate has three different protected areas to preserve forest remnants of the country, with a total area of more than 6000 hectares. Each protected area has one-graduate staff and two technicians.
6. The Directorate of Agricultural Research has a breeding program for field crops. The staff of this program includes 2 M. Sc., 4 graduates and 10 technicians.
7. The General Organization of Seed Multiplication (GOSM) is responsible for the propagation and distribution of seed of main crops: wheat, barley, lentils, chickpeas, potatoes, sugar beets and cotton.
8. The Directorate of the Steppe propagates and collects range shrubs seed for the production of plants for rehabilitation of degraded areas.
9. The Directorate of Forestry and Afforestation organises the nurseries and execute plans for forestry and afforestation.
10. The Directorate of Animal Breeding has a live collection of Shami goat and another of camels for the aim of breeding and distribution.
11. The Arab Center for the Studies of Arid Zones and Dry Lands has also a live collection of Shami goats.
12. The Directorate of Forestry and Afforestation is establishing now a seed bank for forest trees.

#### ***D-5- The Ministry of Higher Education:***

**Universities and Research Centers:** These institutions participated through their Faculties of Agriculture, Veterinary and Sciences. On the one hand because of the research they carry on different ecosystems, plants and animals, and on the other hand because of the education they afford to different students in this regard. All the collected data on the status and trends of the different components of Biodiversity were carried out by these national consultants. Universities have herbaria, animals collections and data banks with all the information on Biodiversity. Post graduate

studies are important source of information on the state of knowledge of the plants and animals in the country.

There are four Universities in Syria: Damascus, Aleppo, Teshrine and Ba'ath. The universities have an ample number of staff specialized in plant taxonomy (13), plant genetic resources (20), animal genetic resources (21), lakes and wetlands (8), steppe (13), Marine biology (24). In Zoology there are (8) Mammiferae specialists, (6) Ornithologists, (8) specialists in reptiles and amphibians, (4) specialists in invertebrates, (9) specialists in insects, (8) specialists in biotechnology, (8) specialists in microbiology, (13) specialists in forests and forest ecosystem.

There are 23 high schools functioning under the Ministry in different parts of the country. Five of these high graduate agricultural engineers assistants which may serve in biodiversity activities.

There are small herbaria in the faculty of Science and the faculty of Agriculture, but both are for special limited aim, like forestry, range and forage plants, and weeds...etc. The staff of such herbaria is one graduate and a technician or it is considered as part of a professor research program.

Research Records University Level. During the last five years the number of post graduate students at the level of Diploma and higher increased clearly

**Table1:** Comparative numbers of post graduate students in basic sciences and biodiversity in different Universities.

University	Basic Studies	Biodiversity Studies	High Degree Research		
			Basic Studies	Biodiversity Studies	Biodiversity Percentage
Damascus	107	16	11	5	45
Aleppo	45	8	14	6	34
Tishrine	35	13	16	16	100
Total	187	37	41	27	

***D-6- Ministry of Irrigation:***

The Ministry of Irrigation, according to Law 16 dated 1982, has responsibility for the protection of all freshwater resources from pollution, as well as conserving the different watersheds throughout the country. To monitor progress, the Ministry of irrigation has set up a large number of testing stations along the major waterways.

***D- 7- None Governmental Parties :***

Syria has community based organizations which cover all sectors of the society. These are:

**- *Farmers Union:***

Which has a unit in each village in the country. The vital function of these units is to distribute seed, fertilizers, feed and veterinary care to the farmers. At the same time the Union helps in the management of the cultivation of field crops and their commercialization. The policy of land use, steppe grazing, sheep fattening and the like are executed through the Union. To include the Farmers Union in the NBSAP a member in the Steering Committee was nominated and a sectoral meeting was held in the head quarters of the Union. The meeting was attended by two leading members of the branch of the Union in each Governorate in the country. Four national consultants of BSAP presented the status and trends of biodiversity in the country and the available options for the conservation and sustainable use. Each presentation was followed by discussion and recommendations from the participants. These were considered in NBSAP.

**-13 *Women Union:***

Which comprises branches in each Governorate and units in all cities and regions of the country. The main activities of the Union are to reduce illiteracy among women and to try develop handcraft arts, crafts and home-economics among women. A special sectoral meeting was organized for the Union, to which two leading ladies from each branch in the country were called . Four national experts from NBSAP project presented the state of biodiversity components in Syria and proposals to conserve it and make sustainable use of biological resources. Discussions and recommendations of the meeting were used in the formulation of NBSAP.

**-14 *Student Union:***

The Student union comprises members from different faculties of the universities (4) and all high schools in the country(11). A sectoral meeting was held in the headquarters of the Union with representatives from units of the Union. The consultants of NBSAP presented the status of the components of Biodiversity. The discussions and recommendations of the meeting were used in the formulation of NBSAP.

**-15 *Youth Union:***

Comprises members from all primary and secondary schools of the country. The main objective of the Union is to create extraschool activities for the youth and summer camps. One of these activities is the “Friends of the Environment” club to which some of the children are members. The sectoral meeting with the Youth Union took place in the headquarters of the Union. Experts of the project presented the status and trends of biodiversity and the need for conservation and sustainable use of

biological resources. The discussions and recommendation were taken in the NBSAP.

**-16 Hand Craft Union:**

Comprises all handcraft communities in the country with branches in all (14) Governorates. A sectoral meeting was organized with representatives from all branches of the Union and the status and trends of biodiversity were presented. Discussions and recommendations were taken in consideration in NBSAP.

**D- 8- NGOs**

There are only a few NGO in Syria concerned with Biodiversity. Two of these participated in the NBSAP.

***Friends of Damascus:***

This is a community of intellectuals concerned about old Damascus city and the preservation of its beauty. A member of this organization took part in the Steering Committee of the project and participated also in its workshops.

***Syrian Biological Society:***

This organization comprises biology teachers and professors who are interested in public awareness and education on the flora, fauna and nature in general. Their activities include public lectures and field excursions to create love for nature. A member of this society took part in the Steering Committee of BSAP as well as all its workshops.

**D-9- The Workshops:**

Three National Workshops were organized for the development of NBSAP. The first was organized in cooperation with the Ministry of Higher Education as an Initiation Workshop. Participants from different universities, Ministries and Community Organizations (83 members) participated and discussed the status and trends of biodiversity in the country. The recommendations were included in NBSAP.

The second was the First national Workshop which was organized in the Cultural Center in Damascus. Participants from all stakeholders of biodiversity (80) were present. The national consultants of NBSAP presented an assessment of the status of biodiversity and proposals of its conservation and the sustainable use of biological resources. The recommendations were included in the NBSAP.

The Second National Workshop was organized in Ba'ath University in Homs. It was attended by (100) participants. The draft NBSAP was presented and discussed. The recommendations were included in the NBSAP.

## **E. Planning and Reporting:**

Syria is committed to the protection of its environment. A Minister of State was appointed in 1979. In 1991, a Presidential Decree established the General Commission for Environmental Affairs (GCEA), the Supreme Council for Environmental Safety and the preparation of a draft Environmental Protection Act.

The Syrian Arab Republic signed the Convention to Combat Desertification in October 1993 and ratified this convention in 1997 together with the Ramsar Convention on Wetland.

The Syrian Arab republic Ratified the Convention on Biodiversity in February 1995.

Barcelona Convention was ratified on 20/5/1987, and the MARBOL Marine pollution treaty was ratified on 13.6.1988. The Vienna Ozone Treaty was adopted on 28.5.1991 at the same time the Basel agreement was also adopted.

### ***E- 1- National legislation:***

- 1- A draft comprehensive environmental law is approved by the Supreme Council for Environmental Safety is being ratified for the country. The valid laws and regulations concerning biodiversity are the following:
- 2- Decree no. 7 dated 1.6.1994 issued by the President of the Republic related to forest protection, its proper management and the establishment of forest reserves.
- 3- Decree no. 152 dated 23.6.1970 issued by the President of the Republic concerning the organization of wild animal hunting.
- 4- Ministerial Declaration no. 41 dated 23.10.1994 issued by the Minister of Agriculture and Agrarian Reform which prohibits hunting of wild animals all over Syria for ten consecutive years period.
- 5- Decree no. 30 dated 25.8.1964 related to the Protection of marine and fresh water organisms and organizing the fisheries.

### ***E- 2- Actions to Achieve the Objectives of CBD:***

#### ***Strategic responses:***

In recognition of the fragile ecosystems, there is full agreement on the following strategic objectives:

There is national consensus expressed in national workshops, regional seminars and sectoral meetings to act according the following:

The Ministry of Agriculture and Agrarian Reform is cooperating with the Ministry of Environment and the Ministry of Higher Education as well as with community based organizations in reviewing and evaluating current agricultural practices.

The concepts of sustainable development and conservation of biodiversity are being introduced into agricultural policy taking into consideration the local economic and social situation on one hand and the requirements of the International Trade Organization on the other.

The Ministry of Agriculture and Agrarian Reform has convened a Supreme Council on Biodiversity and Genetic Resources in the Syrian Arab Republic Comprising of:

Deputy Minister of Higher Education	coordinator
Director of Scientific Agricultural Research, MAAR.	secretary
Deputy Minister of Environmental Affairs	member
Deputy Minister of Agriculture	member
Director of Statistics and Planning	member
Director of Badia (Steppe Directorate)	member
Director of Forestry and Afforestation	member
Director of Agriculture and Irrigation in SPC	member

The responsibilities of the Council include:

1. Plans and Programs for the conservation, management and sustainable use of biodiversity and genetic resources of plants and animals and the formation of technical committees necessary for their implementation.
2. Supervision of projects related to biodiversity and coordination with other ministries and institutions and with regional and international organizations.

The Ministry of Agriculture is executing the Syrian Part of the regional project “ Conservation and Sustainable use of Dryland Agro-biodiversity in Jorgan , Lebanon, Syria and Palestinian Authority” RAB/G32–A/1G/71.

### ***E.3. In- situ Conservation***

The protected areas in Syria receive very good attention from the scientific community. Their legislation and administration are still at early stages and would need further development. A review of the existing areas is shown in **(table 3)**.

The Ministry of Agriculture and Agrarian Reform is cooperating with the Ministry of Environment and the Ministry of Higher Education as well as with community based organizations in reviewing and evaluating *in-situ* conservation.

Many areas hosting various biodiversity components were invariably suggested **(table 4)** by the scientific community in Syria. The Ministry of Agriculture and Agrarian Reform has established a set of protected areas (table 5) specialized in rangeland conservation practices.

Table- 3- Legislated Protected Areas in Syria

Name	Area (Ha)	Location	Main biodiversity component
1. <i>Cedrus-Abies</i>	1350	Lattakia	<i>Cedar-Abies</i> forest
2. Ferunluk	1500	Lattakia	Oake-Pine forest
3. Um –al –toyour	1000	Lattakia	Pine forest+ Marine life
4. Ras- al Bassit	3000	Lattakia	Brutia Pine forest
5. Abou Kobeis	11000	Hama	Evergreen Med. forest
6. Ash Sha'ara- East	1000	Tartous	Evergreen Med. forest
7. Jabal Al –Bala'as	12000	Hama	<i>Pistacia atlantica</i> Stand
8. Jabal Abdul-Aziz	84050	Deir –el –Zour	<i>Pistacia atlantica</i> Stand
9. Sabkhat Jabboul	10000	Aleppo	Wetland life
10.Tlailet	22000	Homs	<i>Desert wild life</i>
11. Al- Thawra	590	Rakka	Lake on Euphrates

**Table-5- Rangeland Protected Areas in Syria**

<b>Location</b>	<b>Area</b>	<b>Name</b>	<b>Location</b>	<b>Area (Ha)</b>	<b>Name</b>
Hama	3017	Abou-ElNitle	Hama	2900	Abou El –Fayad
Hama	940	Rasm El-Ahmon	Hama	1140	Wadi El –Azib
Homs	5000	Jib El-Murr	Homs	1125	El –Sukri
Homs	1760	Kasr El – Hir Gharbi	Homs	2300	Kaser El- Hallabat
Damascus –Rif.	1000	<i>Subhieh</i>	Damascus-Rif.	80	Mankoura
Swieda	100	Research Center – Asfar	Sweida	688	Serj Msallam
Aleppo	2007	Merajha	Sweida	380	Ard El Aoura
Aleppo	1250	Ain El – Zarka	Aleppo	1250	Udami
Rakka	3627	Umableh	Rakka	3574	Hayel El Romman
Rakka	1000	Toual El – Iba	Rakka	3080	Rajm El shih
Deir El – Zor	3934	Jleib El – Houkouma	Deir El – Zor	35258	Zrad
Deir El – Zor	900	Shoula	Deir El – Zor	700	Uzma
Hasakeh	4275	Chaurat Bejara	Hasakeh	2365	Shadada
Hasakeh	685	Zahmimieh		600	Um-Madfah,Reuoch

Table- 4- Suggested Areas for protection in Syria

Pistacia desert Mountain	Homs	60,000	1. Jabal Abou Rajman
Evergreen Oak forest	Sweida	38,500	2. Jabal Al Arab
Juniper Stands	Damascus- Rif	3500	3. Kalmoun mountains
Fresh water life	Rakka		4. Euphrats bain
Salty water life	Homs	20000	5. Sabkhat Maouh
Medicinal plants	Damascus- Rif	20000	6. Zallouh and Ribas
<i>Deciduous oak forest</i>	Lattakia	1250	7. korrat Douran
<i>Pine forest art. Lake</i>	Lattakia	National Park	8. October 16
<i>Deciduous oak forest</i>	Edleb		9. Jabal wastani
<i>Deciduous oak forest</i>	Homs	Mountain with Lebanon	10. Akoum
Evergreen Oak forest	Homs	Mountain with Lebanon	11. Mastoura
<i>Deciduous oak forest</i>	Damascus-Rif.	Mountain with Lebanon	12. Wadi AlKarn ,Rakhleh
Wetland life	Hasakeh		13. Khatounieh
Coastal forest	Lattakia		14. Wadi Hzairin
<i>Fresh water lake</i>	Rakka	64000	15. Assad Lake
Fresh water lake	Homs	Wet- Land	16. Katinah
Evergreen oak forest	Damascus- Kneitra		17. Mount Hermon
Desert Mountain	Hasakeh	Badia with Iraq	18. Mount Sinjar
Desert Mountain	Deir –El Zor	30000	19. Mount El – Bashri
Wetland life	Deraa		20. Mzeiribe Lake
Wetshed area	Homs		21. Rastan Dam
Evergreen oak forest	Homs-Tartous	100	22. Btaise (Barshine)
Berberis antilife	Damascus- Lebanon bordu	30000	23. Barbaris
<i>Deciduous oak forest</i>	Aleppo		24. Hasanli Mountain
Evergreen oak forest	Aleppo		25. Semaan mountain
<i>Deciduous oak forest</i>	Hama	115	26. Bustan
Wild almond	Deraa- Sweida		27. Al –Lujate
<i>Evergreen oak forest</i>	Sweida		28. Kanawate
Fraxinus syriacus	Hama		29. Syrian Dardar
Deciduous oak forest	Kneitra		30. Joulan

#### ***E.4. The supreme council of afforestation:***

The policy of the Supreme Council for Afforestation aims to expand the area which is planted with fruit and forestry trees on mountain and hills areas enjoying high precipitation. These areas are not arable in their present state, farmers are not able to use suitable efficient equipment to make the land suitable for fruit trees at a reasonable price.

1. Every year an area of 24 thousand hectares are planted and equipped with forestry roads and isolation fire barriers in cooperation with the Directorate of Forestry in Ministry of Agriculture. This area is distributed in the different governorates. The total planted area during the period (1977-1998) amounts to 425 thousand hectares and about 1600-km long roads.
2. Other activities are the establishment of protected natural areas for the conservation of ecosystems, plants and animals and the regeneration of the original vegetation:
3. The most important are *Abies –Cedar* forest on the coastal mountains, Jabal Abdel Aziz in Hassake region and Jabal Bela'as in Hama region and Thawra Island in Raqqa region .
4. Protection of the flora and afforestation sites through delimitation and property design in all forest and afforestation areas .
5. Execution of forestry roads and fire lines barriers in the natural forest for the protection from wild fires and to facilitate transport in cases of emer.
6. Establishment of central and off sites units in each governorate for the development of forestry and the use of production.
7. Gradual reclamation of afforestation sites on the mountains and hills enjoying high precipitation so that a natural protection for afforestation sites and its protection from desertification and agricultural expansion and facilitation of agricultural services through the establishment of forest roads.
8. Afforestation of roadsides, high ways, watershed of rivers dams and lakes.
9. Establishment of a green belt 800 km long and 10 km broad to separate the Badia from settlement areas with the aim of arresting desertification and the establishment of oasis around wells in the Badia.
10. Preparation of technical and economic studies for afforestation areas according to the principle of the best tree in the most suitable sites. These studies covered already 1.6 million hectares on the mountains and hills enjoying high rain fall to be planted with fruit trees or forestry; so that the annual planted area is not less than 24 thousand hectares according to available resources.
11. Expansion of fruit palm trees and upgrading of its nurseries and the establishment of a modern laboratory to try tissue culture in Palm propagation and others fruit trees, espacially in the Badia.
12. Expansion of peanut and *Pinus pinea* plantation in the suitable sites and other agroforestry species which the country needs and are necessary for thus ambitious plan.
13. Syria produces annually 30 million plants of forestry and forestry fruit trees.

14.A special forestry research center was established to build on a sound scientific basis.

***E-5 - Strategic Goals and Priority Options:***

***Strategic Goal -1-Protecting Terrestrial Biodiversity***

**Short Term Plan:**

- 1- Promote cooperation between Syrian Government Ministries, Agencies and various community based organizations in developing land-use policies that would guarantee the continued existence of natural areas for wild flora and fauna.
- 2- Limit construction of roads, dwellings and tourist resorts in critical areas around forests and productive rangelands.
- 3- Control forest fires through clearing and utilizing flammable debris in and around forests on a regular basis, employing early detection systems and upgrading fire fighting capabilities.
- 4- Establish a system of protected areas that provides adequate coverage of all remaining natural forests and selected rangelands (see section on “A System of Protected Areas”).
- 5- Ban illegal hunting, particularly of resident and migrating birds that play an essential role in a balanced agricultural production system.

**Long term Plan:**

- 1- Control the harvesting of edible plants and medicinal herbs by providing means to propagate these species for commercial exploitation.
- 2- Surround the system of protected areas or nature reserves with areas of sustainable land-use practices to promote the balance of nature and allow the survival of wildlife for the benefit of future generations.

***Strategic Goal -2- To Conserve and Manage Freshwater Biodiversity:***

**Short term Plan:**

- 1- Promote cooperation between Syrian Government Ministries, particularly the Ministry of Irrigation, Agencies and various community based organizations in developing land-use policies that would guarantee the continued existence of natural areas for wild flora and fauna in wetlands.
- 2- Control pollution and treat all wastes to make sure they are safe before they are dumped into the nearest body of water.
- 3- Minimize the use of agricultural pesticides and chemical fertilizers.
- 4- Limit the number of boats, fishermen, nets in all fishing zones.
- 5- Actively enforce the ban on explosives, poisons and electric currents in fishing areas.
- 6- Establish a system of protected areas for conservation of natural wetlands (see section on “A System of Protected Areas”).

### **Long term Plan:**

- 1- Breed and multiply the species of fish, which are threatened or have already become extinct in certain locations and re-introduce them to suitable locations.
  - 2- Find better uses for salted lands such as converting some of those areas to fish farming.
  - 3- Prepare Environmental Impact Assessments on future irrigation projects.
  - 4- Prepare an integrated proposal for the rehabilitation of all Syrian rivers.
- Surround the system of protected areas or nature reserves with major water catchment areas to conserve sources of freshwater, and introduce sustainable land-use practices to promote the balance of nature and allow the survival of wildlife for the benefit of future generations.

### **Strategic Goal- 3-Generating Income from Local Wild Plants**

#### **Short term Plan:**

- 1- Conduct a scientific survey of the wild plants of economic value found in Syria and enter it into a GIS based computer network.
- 2- Determine the best method for the propagation and commercialization of these wild plants so as to help rural inhabitants to make best commercial use of them.
- 3- Establish protected areas where these wild plants are usually found so as to conserve and propagate them in their natural surrounding.

#### **Long term:**

- 1- Study the genetic composition of these wild plants with a view to improving the performance of their varieties.
- 2- Investigate the possibility of using other less known wild plants for medicinal and aromatic purposes, particularly in the more arid areas of the badia.
- 3- Develop the cultivation of truffles and study the factors responsible for its growth.

### **Strategic Goal -4-Generating Income from Local Wild Animals**

#### **Short term Plan:**

1. Commence serious and well-managed captive breeding program for certain local wildlife, such as game birds and gazelles.
2. Release captive bred birds and mammals into protected areas under expert supervision.
3. Release captive bred birds and mammals that do well in protected areas to open areas of the badia and mountains during certain seasons of the year.

#### **Long term:**

- 1- Involve the responsible hunters and their societies in the long and difficult process of wild animal re-introduction to the wild so that they may understand and support these efforts

- 2- Investigate the feasibility of allowing licensed and properly organized hunting during certain seasons of the year.

### ***Strategic Goal-5- Using Agricultural Biodiversity Sustainably***

#### **Short term Plan:**

1. Conduct a survey of agricultural development projects and take into consideration the results of environmental impact assessments conducted to measure the effect of those projects on conservation of agricultural biodiversity.
2. Continue rehabilitation and reforestation of marginal and desertified land using local species of plants.
3. Support forage production for livestock in rainfed areas.
4. Improve integrated pest management (IPM) for all irrigated crops.
5. Determine the fertilizer requirements for all crops and soil types throughout the country.
6. Review all laws and legislation with a view to suggesting amendments that comply with the requirements of sustainable agricultural production.

#### **Long term Plan:**

1. Develop agricultural rotations that serve the requirements of sustainable development and conservation of agricultural biodiversity.
2. Develop the technology to monitor the breakdown of agricultural pesticides and chemical fertilizers.
3. Develop a system of rewards and punishments that serves the needs of sustainable development.
4. Improve irrigation practices that reduce the amount of water used and prevent wastage of this precious resource.
5. Reclaim salted lands to make it productive in some capacity.
- 5- Upgrade agricultural extension services to enlighten farmers about the advantages of conservation of agricultural biodiversity

### **Strategic Goal-6- Using Local Varieties of Cultivated Plants**

#### **Short Term Plan:**

- 1- Establish and upgrade seed collections of local cultivated plants
- 2- Support research into genetic origins of local cultivated crops & trees.
- 3- Implement laws protecting local varieties of cultivated crops and trees.
- 4- Establish seed & gene banks for long term preservation of local crops.

#### **Long term Plan:**

- 1- Support the cultivation of local varieties by farmers in their fields.
- 2- Set up an information system for local progenitors of food crops.

Cooperations with regional and international organizations to conserve exchange and safeguard the national plant genetic resources.

***Strategic Goal-7- To Conserve Valuable Animal Genetic Material***

**Short term Plan:**

- 1- Encourage and support farmers with local breeds of domestic animals.
- 2- Encourage and support livestock stations that specialize in local breeds.
- 3- Utilize the genetic variability of local domestic animals in breeding programs that aim at improving production.
- 4- Establish an artificial insemination and embryo transfer centers.

**Long term Plan:**

- 1- Compile a database on local breeds, their locations and production levels.
- 2- Enactment of laws and policies that prohibit the export of local breeds of domestic animals.
- 3- Support advanced studies on the genetics of local breeds of animals.

***Strategic Goal-8-Using the Biodiversity of the Badia Sustainably***

**Short term Plan:**

- 1- Determine the carrying capacity of the different rangelands of the badia taking into consideration the rainfall factor and season of growth.
- 2- Cooperate with community based organizations concerned with grazing lands to restore the vegetative cover of the badia through conservation and replanting.
- 3- Utilize where possible the technique of rain or cloud harvesting.
- 4- Implement hunting laws and special directives concerning the principles and seasons of proper hunting in the badia in cooperation with the Ministry of Interior.

**Long term Plan:**

- 1- Expand conservation of biodiversity in the badia to include all the degraded and desertified areas to allow time for the natural vegetative cover to re-establish itself.
  - 2- Combine the distribution of feed and veterinary services in the badia with the organization of grazing schedules that promote rangeland rehabilitation.
  - 3- Utilize the ground water reserves in the badia to increase the emergency forage reserves for sheep
- Establish a research center that studies and stores all data pertaining to the flora and fauna of the badia, as well as the economic and cultural aspects of its nomadic population.

### **Strategic Goal -9-Using the Newly Forested Areas Sustainably**

#### **Short term Plan:**

- 1- Continue the afforestation program in areas that are bare or degraded in order to renew the vegetative cover and prevent erosion of topsoil.
- 2- Support the Forest Research Center by hiring forest ecology specialists and providing them with the necessary facilities and equipment to carry out research into herbal and medicinal plants and agro-forestry programs.
- 3- Utilize remote sensing techniques and GIS technology to determine size and rate of growth of the afforested areas.
- 4- Establish new and expand the seed stock of existing tree nurseries to include local varieties of Syrian trees and shrubs.

#### **Long term Plan:**

- 1- Explain the environmental benefits and economic returns of properly managed forests and afforested areas to the agricultural community through conservation of soil and water.
- 2- Involve farmer organizations in the establishment and management of forests and afforested areas so the agricultural community adopts those areas as an important resource that need to be conserved.

### ***Strategic Goal-10- To Develop Biodiversity Education and Public Awareness:***

#### **Short and Long Term Plans**

- 1- Upgrade school and university textbooks to include biodiversity.
- 2- Upgrade the curricula of all institutes of higher learning to include national biodiversity issues.
- 3- Upgrade the ability of television, radio and newspaper to create the necessary awareness of national biodiversity issues.
- 4- Increase the number of outdoor activities for students, military trainees and clubs that introduce them to biodiversity in Syria.

### **Strategic Goal-11- Coordinating National Biodiversity Research**

#### **Short term Plan:**

- 1- Support the efforts of the Ministry of Higher Education and the national, Arab and international research institutions to develop a coordinated biodiversity research plan.
- 2- Orient and coordinate higher studies in biology, agriculture and veterinary science towards national biodiversity issues.
- 3- Provide adequate reference libraries and laboratory facilities.
- 4- Provide a computer system that includes the Geographic Information System (GIS), access to the Internet and a Home Page on Biodiversity.

### **Long term Plan:**

- 1- Control research in the field of biotechnology to serve developmental needs and ensure national biosafety standards.
- 2- Investigate in depth the genetic biodiversity of plants and animals particularly those that have a potential economic benefit and enter all the above information on digital maps utilizing GIS and GPS technology.

### ***Strategic Goal-9-Controlling the Use of Biotechnology***

### **Short term Plan:**

- 1- Take precautionary measures against all genetically engineered organisms and their products to avoid any possible dangers to human and animal health and natural biodiversity.
- 2- Encourage the use of native plants and animals, rather than introduced species, in agriculture and food processing industries to avoid introducing organisms of unknown genetic origin to Syria.
- 3- Appoint an expert committee or national commission with scientific and technical expertise to study and monitor genetically engineered organisms and their products, advise on regulatory requirements, advise whether they can be imported and what threats they pose to humans and animals.
- 4- Enact appropriate legislation for the import, handling, release and disposal of genetically modified organisms to Syria.

### **Long term Plan:**

- 1- Insist on certificates of origin and description of contents and methods of production prior to granting import permits.
- 2- Utilize modern techniques and environmental screening procedures for importation of plant and animal species to assist in determining genetic origin of products.
- 3- Take all necessary precautions against the importation of genetically altered organisms or their products. If they are imported make sure that these organisms and their products have been tested and tried for a sufficient period of time in their country of origin.
- 4- Request the cooperation of authorities involved in the importation and handling of modified organisms or their products to enhance human, animal and plant safety.
- 5- Support international protocols on biosafety that would guard against the dangers to human health and natural biodiversity from the dangers of genetically engineered organisms and their products.

### **Long term:**

- 1- Establish clubs and organizations for conservation of nature in Syria.
- 2- Encourage publication and translation of books on biodiversity.
- 3- Establish natural history museums, botanical gardens and parks.
- 4- Promote eco-tourism for Syrians, Arabs and foreign visitors.

### ***Strategic Goal-12- Creating an Organizational Structure to Follow-up***

#### ***The National Biodiversity Strategy and Action Plan:***

The recommended organizational structure to follow-up on the implementation of the strategy and action plan is made up of four groups with effective communication links:

- 1- The Government Coordination Center - is the Ministry of State for the Environment that prepared and presented the National Biodiversity Strategy and Action Plan (NBSAP) to the Government of Syria.
- 2- .The Executive Committee – is composed of the National Coordinator for Biodiversity in Syria, the Project Manager of NBSAP, and the Head of Section of the Biodiversity Unit at Ministry of Environment.
- 3- Steering Committee – is composed of representatives of different Government Ministries, Community Based Organizations, Academic Institutions involved in biodiversity.
- 4- Technical Working Groups – composed of experts in the field of biodiversity conservation and sustainable use, who conduct studies, prepare and review reports.

### ***Strategic Goal-13- Enacting Legislation for Biodiversity Conservation***

#### **Short and long term Plans:**

- 1- Legislation to manage the growth of the human population
  - 2- Legislation to protect agricultural lands from degradation
  - 3- Legislation to protect water resources from pollution & degradation
  - 4- Legislation to protect forest resources
  - 5- Legislation to manage flora and fauna and their habitats
  - 6- Legislation to establish protected areas of all categories
  - 7- Legislation to safeguard intellectual property rights
  - 8- Legislation to safeguard genetic resources of local plants and animals with economic value
  - 9- Legislation to control introduced species of plants and animals
  - 10- Legislation to promote use of environmentally clean technology
  - 11- Legislation to safeguard against the hazards of genetic engineering
  - 12- Legislation to require evaluation of the potential income generating capacity of commercially important plants and animals
  - 13- Legislation to promote cooperation between Ministries, agencies, organizations, and syndicates for the conservation of biodiversity
  - 14- Legislation to amend the curricula of all teaching institutions so that they incorporate the subjects related to biodiversity conservation
- Legislation to link human and socio-economic development with the conservation of biodiversity

## **Strategic Goal -14-Strengthening Cooperation for Biodiversity**

### **Short and long term:**

- 1- Review all conventions, treaties, agreements and protocols regarding conservation of biodiversity with Arab, regional and international organizations to ensure compliance and be up to date on recent developments regarding their implementation.
- 2- Benefit from bilateral and multilateral assistance for the establishment of biodiversity conservation. Especially in projects such as a system of protected areas for all the different regions of Syria.
- 3- Attend national, Arab, regional and international conferences and meetings to promote the accomplishments of Syria in the field of biodiversity, and to benefit from recent developments in that field.

Sustainable development and biodiversity conservation is major objectives adopted by the analysis of the national country study on biological diversity in Syria. To attain these objectives the following options were suggested:

1. Establishing of a national data base system connected to various institutions involved in biological diversity.
2. Expansion of the Protected Areas (18 existing) to cover mountain, dry land and grazing areas.
3. Rehabilitating of pasture, browse and medicinal plants habitat.
4. Establishing more botanical gardens, zoos, and national parks.
5. Strengthening germplasm banking system (15) to conserve existing germplasm and propagate the endangered species.
6. Keeping a natural countryside e.g. land use plans.
7. Building current capacities in research and advanced studies.
8. Desalting of Euphrates basin to recover as a natural habitat and agriculture production area.
9. Re-establish biodiversity in fresh water habitat by reducing pollution and proper management.
10. Establishing a protected area specialized in desert and semi-desert birds.

During the development of the NBSAP there were three workshops, each included the contribution of more than 100 participants including senior staff members of Ministries, Researchers from universities, representatives of regional and international organizations, grassroots representatives and NGOs. There were three regional seminars and five sectoral meetings. Each of these included leading members of different sectors and classes of the society: children, students, farmers, and women. The development of the NBSAP included about 40 national consultancies and six international consultancies. The aim was to reach a national consensus on the conservation of Biodiversity and the sustainable use of biological resources.

***E-6-Indicators and Milestones are being developed for monitoring progress and achievements.***

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- First National Workshop BSAP 19-20 June 1999, Damascus.
- Second National Workshop BSAP 2-3 December 1999, Homs.
  
- Regional Seminars (3):
  - Thawra (11 August, 1999)
  - Lattakia (4-5 May, 1999)
  - Suweida (4-5 August 1999)
  
- Sectoral Meetings (5) :
  - Women Union March 4<sup>th</sup> 1999
  - Hand Craft Union 25 July 1999
  - Youth Union 9 August 1999
  - Student Union 19 October 1999
  - Farmers Union 13 November 1999