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MINISTRY OF ENVIRONMENT

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of

LEBANON

to the

CONVENTION ON BIOLOGICAL DIVERSITY

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LIST OF ACRONYMS

ABHASS	Database on research projects sponsored by NCSR in medicine, agriculture, environment, basic sciences, engineering and technology, economy, and related fields
ABS	Access and Benefit Sharing
ACCOBAMS	Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area
ACDI-VOCA	American NGO
ACSAD	Arab Center for the Studies of Arid Zones and Dry Lands
AECI	Agencia Espanola de Cooperacion International
AEF	Arab Environment Facility
AEWA	African Eurasian Migratory Waterbirds Agreement
AFDC	Association for Forest Development and Conservation (NGO)
AGRIS	Universal Network System
ANERA	American Near east Refugee Aid
ArabMab Network	Arab Man and Biosphere Network under the umbrella of UNESCO
ARDA	Arsal Rural Development Association
AREC	Agricultural Research and Education Center
ASAIL	Action for Sustainable Agroindustry in Lebanon
ASHA	American Schools and Hospitals Abroad
ATEN	Atelier Technique des espaces naturels
AUB	American University of Beirut
AUF	Agence universitaire de la Francophonie
BCH	Biodiversity Clearing House / Biosafety Clearing House
BCS	Biodiversity Country Study
BS	Bachelor of Science
CAMP	Coastal Areas Management Programme
CAMRE	Council of Arab Ministers Responsible for Environment
CARIS	International information system for the agricultural sciences and technologyL FAO
CBD	Convention on Biological Diversity
CD	Compact Disc
CDM	Clean Development Mechanism
CDR	Council of Development and Reconstruction
CEA	Commiseriat a l'Energie Atomique
CEDRE	Coopération pour l'Évaluation et le Développement de la Recherche
CEO	Collegiate Entrepreneurs Organization
CFC	Chlorofluorocarbon
CFH	Cooperative Housing Foundation
CHM	Clearing House Mechanism
CIDA	Canadian International Development Agency
CIESM	Mediterranean Science Commission
CIHEAM	Centre International de Hautes Etudes Agronomiques Méditerranéennes
CINDA	Computer Index of Neutron Data/ Database
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
CMS	Convention on Migratory Species
CNA	Competent National Authority
CNRS	Centre National de Recherches Scientifiques/ National Council for Scientific Research
CO2	Carbon Dioxide
CoDeL	Combating Desertification in Lebanon
CODIS	Combating Desertification Information System
CoM	Council of Ministers
COP	Conference of Parties
CORDIS	Community Research and Development Information Service
CPB	Cartagena Protocol on Biosafety
CRDP	Centre de Recherche et du Development Pedagogique
CSA	Community Supported Agriculture
CSD	Commission on Sustainable Development
CWANA	Central and West Asia and North Africa
CZM	Coastal Zone Management
DAI	Development Alternatives Inc.
DAR-IAURIF	Dar Al Handasah-Institut d'Amenagement et d'Urbanism de la Region de l'Ile-de-France
DDC	Drylands Development Centre
DPA	Desertification Prone Areas
EC	European Commission
ECA	The United Nations Economic Commission for Africa
ECE	The United Nations Economic Commission for Europe
ECLAC	The United Nations Economic Commission for Latin America and the Caribbean
EC-LIFE	European Commission Life
EE	Energy Efficiency

EFL	Environment Fund for Lebanon
EIA	Environmental Impact Assessment
EIC	Environment Information Center
EMFTA	Euro-Mediterranean Free Trade Area
ENSDF	Evaluated Nuclear Structure Data File
EPEAU	Enhancement of Permanent Environment Awareness
EPI	Environmental Performance Index
ESCO	ESCO Global Website
ESCAP	Economic and Social Commission for Asia and the Pacific
ESCWA	Economic and Social Commission for West Asia
EURONATURE	Scientific Database
FAFS	Faculty of Agricultural and Food Sciences
FAO	Food and Agriculture Organization
FON	Friends of Nature (NGO)
FFEM	Fonds Français pour l'Environnement Mondial
FRA	Forest Resource Assessment
GAC	Government Appointed Committee
GDP	Gross Domestic Production
GEF	Global Environment Facility
GFCM	General Fishing Commission for the Mediterranean
GHG	Green House Gaz
GIS	Geographical Information System
GM	Genetically Modified
GMO	Genetically Modified Organisms
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
HACCP	Hazard Analysis and Critical Control Point
HB	Healthy Basket
HCH	Higher Council for Hunting
IAIA	International Association for Impact Assessment
IAP	Invasive alien plants
IAURIF	Institut d'Amenagement et d'Urbanisme de la Region de l"Ile-de-France
IBA	Important Bird Areas
IBSAR	Initiative for Biodiversity Studies in Arid Regions
ICAM	Integrated Coastal Area Management
ICARDA	International Center for Agricultural Research in the Dry Areas
ICM	International Creative Management
ICGB	International Centre for Genetic Engineering and Biotechnology
ICZM	Integrated Coastal Zone Management
IDAL	Investment Development Authority of Lebanon
IDRC	International Development Research Center
IEE	Initial Environment Evaluation
IMAC	Integrated Management of Eastern Mediterranean Coastlines
INAPG	Institut National d Agronomie Paris Grignon
INIS	International Nuclear Information System/ Internet Directory
INIST	Institut de l'Information Scientifique et Technique
INOCLE	Inter-Islamic Science and Technology Network on Oceanography
INRA	Institut National de la Recherche Agronomique
ISO	International Organization for Standardization
ISSC	International standard for sustainable wild collection
IPGRI	International Plant Genetic Resources Institute
IPS	Invasive plant species
IUCN	World conservation union
IWRM	Integrated Water Resources Management
JICA	Japanese Cooperation International Agency
LAPs	Local Action Programmes
LARI	Lebanese Agricultural Research Institute
LAU	Lebanese American University
LCEC	Lebanese Center for Energy Conservation
LCECP	Lebanese Center for Energy Conservation Project
LEDO	Lebanese Environment and Development Observatory
LME	Large Marine Ecosystems
LMO	Living modified Organisms
LMT	Lebanon Mountain Trail
LNCSR	Lebanese National Center for Scientific Research
LRF	Lebanon Recovery Fund
LWQM	Litani water quality management
LU	Lebanese University
MAB	Man and Biosphere
MAP	Mediterranean Action Plan
MAPs	Medicinal and Aromatic Plants

MCM	Million Cubic Meters
MDG	Millenium Development Goal
MECINET	Mediterranean Citrus Network
MEDA II	Programme/ Financial instrument of the Euro-Mediterranean Partnership
MEDASSET	The Mediterranean Association to Save the Sea Turtles
MEDFOREX	Mediterranean Forest Externalities
MEDWETCOAST	Conservation of Wetlands and Coastal Zones in the Mediterranean
MEW	Ministry of Energy and Water
METT	Management Effective Tracking Tool
MLF	Multilateral Fund of Montréal Protocol
MNCSR	Marine National Council for Scientific Research
MOA	Ministry of Agriculture
MOE	Ministry of Environment
MOET	Ministry of Economy & Trade
MOI	Ministry of Interior
MOT	Ministry of Tourism
MOU	Memorandum of Understanding
MPCs	Mediterranean Partner Countries
MSB	Millennium Seed Bank
MSSD	Mediterranean Strategy for Sustainable Development
MREA	Midwest Renewable Energy Association
MSc	Master of Science
MSC-IPP	Management Support Consultant – Investment Planning Program
MRCZM	Marine Resources and Coastal Zone Management Program
MWC	MedWetCoast Project
NAP	National Action Plan
NAPPA	National Action Plan for Protected Areas
NBC	National Biosafety Council
NBF	National Biosafety Framework
NBSAP	National Biodiversity Strategic and Action Plan
NCA	National Competent Authority
NCRM	NCMR National Center for Marine Research
NCSA	National Capacity Self Assessment for Global Environmental Management
NCSR	National Center for Scientific Research
NEAP	National Environment Action Plan
NGO	Non-Governmental Organizations
NRP	National Reforestation Plan
O3	Ozone
OFID	Fund for International Development
OH	Ohio
OPEC	Organization of the petroleum exporting countries
PA	Protected Areas
PAMIS	Protected Areas Management information System
PAP	Protected Areas Project
PDF-A	Project Development Fund-A
PDF-B	Project Development Fund-B
PGR	Plant Genetic Resources
PINR	Palm Island Nature Reserve
RAC-SPA	Regional Activity Center for Specially Protected Areas
RAMOGE	Accord de Prévention et lutte contre la pollution marine
RAMSAR	The Convention on Wetlands
RDNRD	Rural Development and Natural Resources Directorate
RE	Renewable Energy
REDD	Reducing Emissions from Deforestation and Degradation
REMPEC	Regional marine pollution emergency response center
RICAMARE	Research in Global Change in the Mediterranean
RFU	Regional Facilitation Unit
ROWA	Regional Office for West Asia/ United Nations Environment Programme
RSCN	Royal Society of the Conservation of Nature in Jordan
RSGF	Ramsar Small Grant Fund
RSPB	Royal Society for Protection of Birds
SAIL	Sustainable Agribusiness Initiative in Lebanon
SAP-BIO	Strategic Action Plan for the Conservation of Biological Diversity in the Mediterranean Region
SARD	Sustainable Agriculture and Rural Development
SDATL	Schema Directeur d'Amenagement du Terrritoire Libanais
SDC	Swiss Agency for Development and Cooperation
SEA	Strategic Environmental Assessment
SELDAS	Strengthening the environmental Legislation, Development and Application System/ Project

SEPASAL	Survey of Economic Plants for Arid and Semi-Arid Lands
SISPAM	Stable Institutional Structure for Protected Areas Management/ Project
SLM	Sustainable Land management
SO2	Sulfure Dioxide
SOER	State of the Environment Report
SPA	Specially Protected Areas
SPASI	Strengthening the Permitting and Auditing System for Industries
SPNL	Society for the Protection of Nature
SPA	Specially Protected Area
SRAP	Subregional Action Plan
SRI	Stanford Research Institute
STIP	Science and Technology Information Policy
SWEMP	Seventh International Symposium on Environmental Issues and Waste Management in Energy and Mineral Production
TAG-AMIDEAST	TAG-America-Mideast Educational and Training Services
TCNR	Tyre Coastal Nature Reserve
TCP	Technical Cooperation Program
TT&C	Technology Transfer and Cooperation
UK	United Kingdom
UNADEP	Union of the Northern Association for Development, Environment and Patrimony
UNASYLVA	The International Journal of Forestry and Forest Industries
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFFCCC	UN Framework Convention on Climate Change
UNICEF	The United Nations Children's Fund
UoB	University of balamand
USA	United States of America
USAID	United States Agency for International Development
USAID-IRDP	USAID Integrated Rural Development Programme
USD	United States Dollar
USDA	US Department of Agriculture
USEK	Universite Saint Esprit Kaslik
UVC	Underwater Visual Census
WANANET	West Asia and North Africa Network
WHC	World Heritage Convention
WHO	World Health Organization
WIPO	World Intellectual Property Organization
WRI	World Resources Institute
WTO	World Trade Organization
WWF	World Wild Fund
YMCA	Young Men's Christian Association of Lebanon
YMCA-IRDP	Young Men's Christian Association of Lebanon - Integrated Rural Development Programme

EXECUTIVE SUMMARY

Overview of Status of Biodiversity in Lebanon

The Lebanese Republic is located in the Middle East at the east end of the Mediterranean, the geographic coordinates of which are 33°00'N latitude and 35°50'E longitude. Also known as Al-Jumhuriyyah al-Lubnaniyyah in Arabic, Lebanon comprises 10,451 km^2 of mainly mountainous territory. It is densely populated; the total population is approximately 3,874,050 in July 2006. Its marine waters extend up to 12 nautical miles beyond the shores which stretch along the west side of the country for c.250 km. Lebanon is a bio-diverse country which also has a high level of socio-cultural diversity and a rapidly growing country with economy in transition. There are 9,119 known species in Lebanon, roughly equally distributed between fauna and flora species.

Lebanon occupies only 0.007 % of the world's land surface area and is a home to 1.11% of the world's plant species and 2.63% of the reptile, bird and mammal species. Its sea is home to about 1790 species, representing almost 2.7% of the world's marine species.

Lebanon is home to about 2600 terrestrial plant species. 8.5% of them are broad endemic (endemic to Lebanon, Syria and Palestine) and 3.5% are endemic to Lebanon. Relative to its size, Lebanon boasts one of the highest densities of floral diversity in the Mediterranean basin, which in turn is one of the most biologically diverse regions in the world. Similarly, the vegetation of the Lebanon has an exceptionally high species-area ratio of 0.25 species per km^2, compared with a ratio of 0.0081 per km^2 for South Africa, 0.0044 for Brazil, 0.0021 for Egypt, 0.022 for Jordan, 0.015 for Spain, 0.017 for Syria and 0.011 for Turkey. The faunal diversity of Lebanon is also high relative to the country's surface area when compared to neighboring countries (0.028 species/ km^2 for Lebanon; 0.019 for Syria; and 0.017 for Libya; and 0.46 for Jordan.

Lebanon is influenced by the Mediterranean and provided as such by a variable wealth of habitats with its islands, coastal lands, rivers and high mountains which culminate at 3088 metres *asl*. Four principal factors have interacted in this region to produce an exceptionally rich and unique biodiversity: biogeography, geology, ecology and historic human settlements in the Mediterranean area. More than any other region in the world, the Mediterranean region best exemplifies the environmental change in response to man environment interactions. Lebanon is an integral region in the Mediterranean Basin, it falls within a recognized centre of plant diversity that is considered a global hotspot which ranks third in the world among hotspots in both plant diversity and endemism, surpassed only by the ultra-diverse Tropical Andes and Sundaland.

The topography of the country imposes various micro-environments for both terrestrial and fresh water biodiversity, most ecosystems, however, have narrow ranges and their biotypes are struggling for existence against a changing environment. The noted biodiversity of Lebanon with its seven ecological phyto-association zones is mostly the result of the geology and physiography of the landscape, the country's location at crossroads between continents and human practices over the centuries. Geologically, Lebanon consists almost exclusively of limestone. Most are of Cretaceous origin, with Jurassic limestone in some areas, principally in the south. Only in a few places, especially in the north, do basaltic rocks appear. The softness of the limestone has allowed the 17 perennial or year round rivers as well as the 23 seasonal rivers to create impressive valleys in many places with near-vertical sides. The climate of Lebanon is Mediterranean but with some particularities caused mainly by the topography. Predominantly westerly winds bring abundant rain—principally in winter—while the summers are mainly dry. Coastal areas receive over 800 mm of rain p.a., and most mountain areas over 1000 mm. Most rain falls on the western slopes of the

Lebanon range, with the summits receiving less than lower areas. The Beqaa valley that is a part of the African Rift complex and Anti-Lebanon generally receive less than 700 mm and the Hermel semi-desert in the northern Beqaa less than 250 mm. According to UNESCO, Lebanon is classified a true mosaic of ecological systems broadly representing the "evergreen sclerophylic broussailles and forests" biogeographic region within a Mediterranean biome.

Lebanon encompasses the important components of the Mediterranean vegetation (*Arbutus, Ceratonia, Pistacia, Pinus, Quercus* and *Laurus*) which are relicts from the ancient forests that dominated the Basin 2 million years ago and which represent the past and present climax of the country. Additionally, cold shrubs (*Artemisia, Astralagus*, and members of Ephedraceae) and trees (*Acer, Betula, Cercis, Fagus, and Ulmus*) invaded the Mediterranean, including Lebanon, during the Pleistocene from Europe and Asia and some are still present on the Lebanese territory. Notable keystone and flag plant species in the country is the famous Lebanon cedar (*Cedrus libani*) that has been exploited since the rise of civilization in the Fertile Crescent. Whatsoever, The Lebanese natural landscape is rich, offering in total 9,119 species of which 4,633 are of the plant and 4,486 of the animal kingdoms, of which many are threatened with decline and extinction.

What is remarkable in Lebanon the gradual change from Mediterranean to continental Mediterranean and sub-desert conditions from west to east and the gradual altitudinal change from the batha (degraded garrigue) of the Thermo Mediterranean to the tragacanth of the Sub-alpine and Alpine zones through garrigues (degraded maquis) and maquis of oak and forests of pine, cedar and fir. The latter finds its southern limit of world distribution in northern Lebanon.

Lebanon waters are part of the Mediterranean Sea which is characterized by a relatively high biodiversity that is indicated by the fact that it constitutes less than1% of the world's ocean surface, while holding as much as 6% of all marine species. The connection established by the Suez Canal in 1869 resulted in the introduction of Indo-Pacific marine organisms (Lessepsians) to the east Mediterranean; including Lebanon where at least 67 species (nektons, nectobenthos, benthos fauna and flora) originated from the Red Sea do occur.

Nearly the same types of threats affect the mammals, birds and reptiles of Lebanon where habitat loss appears to be the main threatening factor followed by chemical pollution, illegal hunting and persecution.

Unfortunately, there are no national red lists of flora or fauna species in Lebanon. Furthermore, it seems that neither the naturally hybridized nor the alien invasive species are given a weight or priority in the country. Details are presented in Chapter one.

Status of National Biodiversity Strategy and Action Plan

Lebanon signed the Convention on Biological Diversity (CBD) in 1992 and ratified it in 1994 (Law No. 360/94). The Ministry of Environment (MoE) developed in 1998 with the support of UNDP/GEF a National Biodiversity Strategy and Action Plan (NBSAP) thus addressing Article 6a of the Convention which calls contracting Parties to "*Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity*".
In response to more recent obligations related to the 2010 biodiversity target, the Ministry of Environment with the support of the UNDP/GEF has revised its NBSAP in 2005 and elaborated a draft addendum to the National Biodiversity Strategy and Action Plan which aligns the proposed actions in the 1998 NBSAP with the goals and targets of the provisional framework that was adopted by the Conference of Parties (COP8) in 2004 in its decision VII/30, in addition to suggesting a time frame for execution, a responsible body as well as an expected budget for implementation.

An overview of the progress made in implementing the national priority actions of the 1998 NBSAP is provided in chapter two in form of a matrix in which the status of implementation of each defined action under each thematic area of the NBSAP is given. In addition, an alignment of each thematic area of Lebanon NBSAP with the CBD programmes of work was done as well as a more specific alignment of the planned actions under each thematic area with the relevant CBD articles, thematic programmes and cross-cutting issues was also made and presented, to provide information on how activities under the NBSAP contribute to the implementation of the articles of the Convention and the thematic programmes and cross-cutting issues adopted under the Convention.

Sectoral Integration of Biodiversity Considerations

One of the main challenges in the NBSAP implementation was the involvement of the other different concerned ministries besides the Ministry of Environment, in the implementation of the activities of the NBSAP that fall under their prerogatives thus the integration by these concerned institutions of the biodiversity considerations into their plans and programmes.

The Government Policy Statement issued on 5/8/2008 has included an entire section related to the environment, this section covered nature resources and green cover but not specifically biodiversity.

The principle of biodiversity protection which stipulates that all activities should avoid causing damages to the different components of the biodiversity, was adopted by the law for the Protection of Environment (Law No.444 dated 29/7/2002).

Impact assessment was also required by the law 444, and accordingly drafts EIA and SEA decrees were prepared by the Ministry of Environment and submitted to the Council of Ministers for endorsement. The draft decrees have listed biodiversity as one of the components to be addressed in the impact assessment studies. Based on the law 444, official EIA studies are being submitted to the Ministry of Environment since 2002 for major development and infrastructure projects and SEA studies since 2005 for major plans, and all these studies are addressing biodiversity considerations.

Regarding mainstreaming biodiversity into other relevant sectoral and cross-sectoral national plans, programmes and policies besides the environment, chapter 3 reveals that some have addressed directly biodiversity considerations such as the “National Reforestation Plan” prepared by the Ministry of Environment in 2001 and executed since then, the “Hunting Law” issued in 2004, the “Strategy for Agricultural Development in Lebanon” prepared by the Ministry of Agriculture in 2004, the “National Master Plan for land Management in Lebanon (SDATTL)” prepared by the Council for Development and Reconstruction in 2004 and approved by the Council of Ministers in 2009, the “Desertification National Action Plan” prepared by the Ministry of Agriculture in 2003, as for the “National Strategy for Forest Fires” in Lebanon issued in 2009 although it did not refer explicitly to biodiversity but its implementation will contribute definitely to the conservation of forest biodiversity and ecosystems. However in these mentioned cases the major challenge remains the proper enforcement of the provisions of these strategies and plans.

Nevertheless in the majority of the cases, the other main sectors have integrated environmental considerations but not specifically biodiversity, however they cover natural resources and biodiversity among other environmental components thus contributing indirectly to biodiversity mainstreaming such as the following sectors: “Tourism” through promoting ecotourism activities, “Education” through the integration of environmental education within the school curricula into the various disciplines, “Communication” through the coverage of environmental news and issues in the media in addition to the internet, “Economy and Trade” through the Trade and Environment programmes, “Fisheries” through the issuance of many decisions regulating fishing practices, “Industry” through the environmental conditions defined by the Ministry of Environment for the establishment and

operation of each industrial establishment during the permit issuance process. In addition to the "National Master Plan for Quarries" prepared by the Ministry of Environment and issued in 2009 and which has incorporated environmental considerations in general but not particularly biodiversity.

Some sectors didn't address even considerably the environment component such as the Water and Energy sectors and the "National Action Plan for Solid Waste Management in Lebanon" issued in 2006 however the locations defined in the latter for the establishment of solid waste management facilities were subject to impact assessment studies in 2008 before their establishment thus covering biodiversity components among other environmental components.

On the other hand, mainstreaming biodiversity considerations is achieved within the context of some projects such as the LARI/UNDP/GEF project on "Mainstreaming Biodiversity Management Considerations into Medicinal and Aromatic Plants Production Processes" and the LARI/UNDP/GEF "Agrobiodiversity project".

The findings of Chapter 3 show that there is a major progress in Lebanon in mainstreaming environment into other sectoral plans and programmes but in the majority of the cases the biodiversity component is not tackled in particular. Some of the sectoral plans have addressed clearly the biodiversity components, while others have integrated environmental considerations in general without referring directly and explicitly to biodiversity. Therefore biodiversity considerations need to be integrated more specifically into the relevant main sectors and the sectoral and cross-sectoral plans, policies and strategies.

Conclusion: Progress towards 2010 Target & Implementation of the Strategic Plan

In general, the many areas of biodiversity conservation, sustainable use and management in Lebanon witnessed a significant progress at least since the preparation of the NBSAP in 1998.
The actions of the latter and those of its draft addendum in 2005 are satisfactorily linked to and serving the 2010 Target and the related global goals and targets as well as the goals and objectives of the Strategic Plan of the Convention. However, more improvement and actions at national level are needed to achieve progress towards the global targets.
Lebanon has achieved certain results after a period of implementing the CBD through performing national actions that contribute to the biodiversity conservation and sustainable use mainly:

- The ratification of the Law on the Protection of Environment (Law 444/02) and the Law of Hunting (Law 580/04) and the preparation of the draft law regulating access to and benefit sharing of biological and genetic resources of Lebanon, draft framework law for protected areas, draft EIA and SEA decrees, and the draft biosafety decree that was developed based on the NBF. Other legislations were promptly promulgated in respect to biodiversity conservation.
- The considerable increase in the number of protected areas of different categories (8 natural reserves, 3 biosphere reserves, 16 protected forests, 16 protected natural sites/landscapes, 4 Ramsar sites, 5 World heritage site, 15 IBAs). With the exception of the natural reserves, all other protected areas are in need of a mechanism for proper management and monitoring.
- The development of major strategies and plans: National Strategy for Forest Fires, National Master Plan for land Management, National Action Plan for Protected Areas (NAPPA), National Action Plan for combating degradation and desertification, National Reforestation Plan (NRP) and National Biosafety Framework in addition to other National Action Plans but which need more follow-up for their adoption at national level and their implementation.

- The progress of a community based nature conservation system through several implementation methods but following capacity building, awareness and education campaigns. The results show the national strategy effectiveness in biodiversity conservation and management.
- The integration of environmental concepts, biodiversity conservation and sustainability into the gathering, processing and marketing of globally significant Medicinal and Aromatic Plants (MAPs) in Lebanon; into the law of hunting through the incorporation of sustainable hunting approach; into different levels of education and schools curriculum, EIA, SEA, agrobiodiversity, agriculture policy and major sectors of development. Biodiversity considerations have been indirectly linked to Climate Change impact, combating desertification, Ramsar sites and World Heritage sites.
- Agricultural development such as increases in economic plant products, organic farming, poultry, and aquacultural products has helped reduce pressures on natural exploitation, and thus protect biodiversity and aquatic communities.

The main achievements can be considered the improvement of the legal framework, *In- sit*u conservation in particular protected areas, research, training, public awareness and education and Environmental Impact Assessment in addition to the beginning of mainstreaming biodiversity conservation to certain extent into sectoral and cross sectoral plans and programs at national level but this needs further enhancement to cover all main sectors and to address specifically biodiversity components and not only the integration of environmental considerations in general.

The main difficulties are the lack of financial resources and up-to-date information, as well as the lack of specialists and opportunities for their training. Although important legislation were drafted and/or issued, the difficulty consists in the lengthy process of law endorsement as well as proper enforcement of existing legislation. The cooperation between sectors needs to be reinforced. There is also a lack of efficient coordination of both research and nature protection activities.

The only national flora and fauna studies or species inventories in Lebanon date back to 1996 (Biodiversity Country Study), all other more recent species studies are either in form of checklists limited to protected areas or specific studies conducted in some sites by single researchers. Despite the fact that the protection of the globally threatened species is considered in the Lebanese legislation, there are no studies of status and trends of the taxa at national level nor do the habitats in which the restoration of species is an integral part of conservation represent all types of ecological areas of the country. Moreover, trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socio-economic importance are in need to be identified whilst the indicators to monitor trends are far from being nationally completed. In addition, there is a major lack in studies related to alien species and alien invasive species in addition to proper mechanism for their control and monitoring and lack in alien species management plans.

In overall, the findings of the report indicates in relation to Lebanon's progress with respect to the CBD objectives, that Lebanon had many programs and initiatives in place that address the first objective of the CBD "conservation of biodiversity", the second objective "sustainable use" has started to be addressed but in specific activities and needs to receive more attention and the third objective "fair and equitable sharing of the benefits" was lacking specially in the absence of ratification of the draft "ABS" national law.

FOURTH NATIONAL REPORT
TO THE UNITED NATIONS CONVENTION ON BIOLOGICAL DIVERSITY

CHAPTER - I

OVERVIEW OF BIODIVERSITY STATUS, TRENDS AND THREATS

1.1 INTRODUCTION

This chapter provides an overview of Lebanon's biodiversity status and trends, and threats to biodiversity. The aim is not to be comprehensive but rather to inform and guide decision makers on the values of and threats facing biodiversity in Lebanon.

The National Biodiversity Strategy and Action Plan (NBSAP, 1998) as well as its addendum (2005) to fill the gaps of the NBSAP, remain the reference of base for addressing CBD issues in Lebanon. The NBSAP served as the basic framework by which biodiversity conservation and its sustainable utilization has been structured while the NBSAP addendum has taken into consideration the thematic programmes of work and cross cutting issues defined by the CBD and aligned them with those addressed in the NBSAP. In addition, Lebanon- through the addendum and in response to the more recent obligations related to the 2010 biodiversity targets addressed in Decision VI/26 and VII/30 of the Conference of Parties – has revised and aligned its NBSAP according to the provisional framework for goals and targets endorsed in COP decision VII/30 in order to highlight Lebanon's efforts towards 2010 commitments.

The chapter is structured as follows:

- Section 1.2 gives a brief **overall picture** of biodiversity status, trends and threats in Lebanon
- Section 1.3 deals with biodiversity status, trends and threats in the **terrestrial environment**
- Section 1.4 deals with status, trends and threats in the **freshwater environment**
- Section 1.5 deals with status, trends and threats in **Agrobiodiversity**
- Section 1.6 deals with status, trends and threats in the **marine environment**
- Section 1.7 deals with the **implications for human wellbeing**

The sections 1.3 till 1.6 represent the 4 thematic areas that are included in the Lebanese NBSAP. They are considered relevant nationally and address directly existing situations and limitations.

It is worth noting that Lebanon is still in the process of establishing a system for tracking how its 1998 National Biodiversity Strategy and Action Plan is being implemented, whether main objectives are being achieved and if targets are met. In 1999-2001, the Lebanese Environment & Development Observatory (LEDO) project has established 90 environment and development indicators for Lebanon as a basis for continuous environmental monitoring system. In 2005, the Top-up Biodiversity Enabling Activity Project - through a draft addendum to the NBSAP- has revised and aligned the actions set in the 1998 NBSAP with the goals and targets of the provisional framework for goals and targets endorsed in COP decision VII/30 in order to highlight Lebanon's efforts towards 2010 commitments, Furthermore, the draft addendum has translated each action of the 1998 NBSAP into defined activities and provided for the initiation of each activity a brief description of possible indicators that could be considered or elaborated. Under the same Top-up Biodiversity Enabling Activity Project, a set of guidelines for integrating monitoring programs and indicators in projects within the context of the National Biodiversity Strategy and Action Plan for Lebanon was also prepared. Despite all, the use of the existing indicators remains of limited efficiency in the absence of a national biodiversity database and national biodiversity monitoring programme.

1.2 THE OVERALL PICTURE

1.2.1 Lebanon's unique biodiversity

The Lebanese Republic is located in the Middle East at the east end of the Mediterranean, the geographic coordinates of which are 33°00'N latitude and 35°50'E longitude. Also known as Al-Jumhuriyyah al-Lubnaniyyah in Arabic, Lebanon comprises 10,451 km^2 of mainly mountainous territory. It is densely populated; the total population is approximately 3,874,050 in July 2006 (UNDP, 2006). Its marine waters extend up to 12 nautical miles beyond the shores which stretch along the west side of the country for c.250 km. Lebanon is a bio-diverse country which also has a high level of socio-cultural diversity and a rapidly growing country with economy in transition.
There are 9,119 known species in Lebanon, roughly equally distributed between fauna and flora species (see Figure 1). The distribution of the floral and faunal species over the three main habitats of Lebanon is illustrated in figures 2 and 3 respectively.

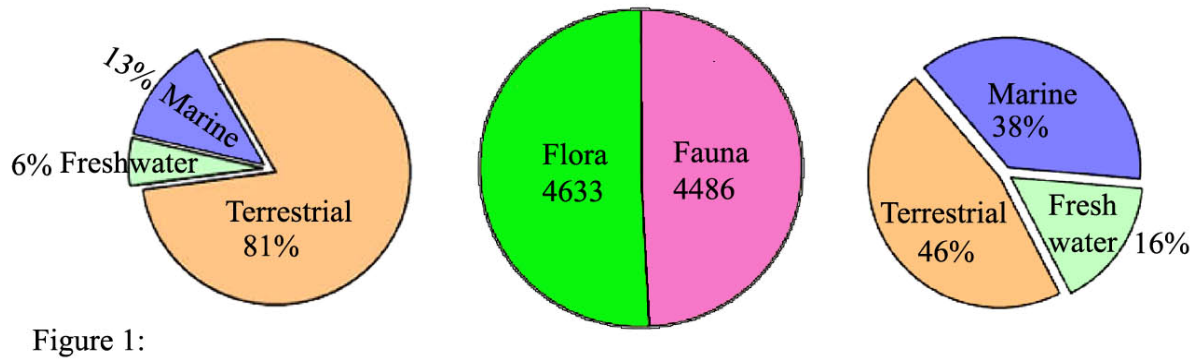


Figure 1:
Central cercle: Number of known Flora and Fauna species in Lebanon
To the left: Breakdown of floral species by Habitat
To the right: Breakdown of fauna species by Habita
(Source: MoA/UNEP, 1996)

Lebanon occupies only 0.007 % of the world's land surface area and is a home to 1.11% of the world's plant species (Tohmé & Tohmé 2007) and 2.63% of the reptile, bird and mammal species. Its sea is home to about 1790 species, representing almost 2.7% of the world's marine species. Table (1) gives information on the number of described species in each taxonomic group in Lebanon as well as the percentage of globally described species that this represents (Source: Biodiversity Country Study (BCS) MoA/UNEP/GEF, 1996).

Table 1: Species richness within Lebanon in relation to the world (sources are indicated within the table)

Taxon	**Number of described species in Leb.**	**% of the earth's species**
Mammals	54 (BCS, 1996; Bara & Tohmé, *pers. Comm*.)	1.38
Birds	394 (Ramadan-Jaradi *et al.* 2008)	4.39
Amphibians	6 (Hraoui et al, 2001)	0.15
Reptiles	54 (Hraoui et al, 2002)	4.6
Freshwater	610 (BCS, 1996 ; Dia, *pers. comm*.)	7.06
Marine fish	367 (BCS, 1996 ; Bariche *et al*, 2005)	2.74
Invertebrate	3835 (BCS, 1996)	0.27
Plants	2598 (Tohmé & Tohmé, 2007)	1.11

As shown in Table 1, Lebanon is home to about 2600 terrestrial plant species. 8.5% of them are broad endemic (endemic to Lebanon, Syria and Palestine) and 3.5% are endemic to Lebanon (BCS). Relative to its size, Lebanon boasts one of the highest densities of floral diversity in the Mediterranean basin, which in turn is one of the most biologically diverse regions in the world (Médail and Quézel, 1997). Similarly, the vegetation of the Lebanon has an exceptionally high species-area ratio of 0.25 species per km^2, compared with a ratio of 0.0081 per km^2 for South Africa, 0.0044 for Brazil, 0.0021 for Egypt, 0.022 for Jordan, 0.015 for Spain, 0.017 for Syria and 0.011 for Turkey. The faunal diversity of Lebanon is also high relative to the country's surface area when compared to neighbouring countries (0.028 species/ km^2 for Lebanon; 0.019 for Syria; and 0.017 for Libya; and 0.46 for Jordan.

Lebanon is influenced by the Mediterranean and provided as such by a variable wealth of habitats with its islands, coastal lands, rivers and high mountains which culminate at 3088 metres *asl*. Four principal factors have interacted in this region to produce an exceptionally rich and unique biodiversity: biogeography, geology, ecology and historic human settlements in the Mediterranean area (Blondel and Aronson 1999). More than any other region in the world, the Mediterranean region best exemplifies the environmental change in response to man environment interactions. Lebanon is an integral region in the Mediterranean Basin, it falls within a recognized centre of plant diversity that is considered a global hotspot (Myers *et al*. 2000) (see figure 1) which ranks third in the world among hotspots in both plant diversity and endemism, surpassed only by the ultra-diverse Tropical Andes and Sundaland.

Figure 2: The whole Lebanon in the heart of the Mediterranean Hotspot.

The topography of the country imposes various micro-environments for both terrestrial and fresh water biodiversity, most ecosystems, however, have narrow ranges and their biotypes are struggling for existence against a changing environment. There are five geomorphological regions in Lebanon (CDR/ECODIT-IAURIF, 1997): (see also figure 2 & 3):

1. Coastal zone, 250 km long, included the shoreline and continental shelf, the coastal plains and the foothills of Mount Lebanon up to elevations of 250 meters.
2. Mount Lebanon range, about 160 km long and 25-40 km wide, includes middle and high elevation zones above 250 meters. It rises from Akkar in the North and extends South to the hills of Jabal Amel. Mount Lebanon peaks at 3,088 meters at Kornet es-Saouda in the north.
3. Beqaa plain, a land depression separating the Mount Lebanon and Anti- Lebanon ranges. It comprises an 8-12 km wide fertile corridor and is about 120 km from North to South. The Beqaa plain is drained by the Aassi River from the North and by the Litani River from the South.
4. Anti-Lebanon range, extends across the Lebanese-Syrian borders. It peaks at 2,600 meters (Tallat Moussa). Slopes are generally more gentle compared to Mount Lebanon. The southern sections of he Anti-Lebanon range include Jabal el Cheikh (Mount Hermon), which intercepts rainwater and redistributes water into at least three main watersheds across Lebanon, Syria and Palestine.
5. South Lebanon, an elevated plateau that extends a short distance inland from the western shores of South Lebanon to the Mount Hermon foothills in the East. This region is intersected by many seasonal streams flowing from west to east and discharging into the Mediterranean Sea.

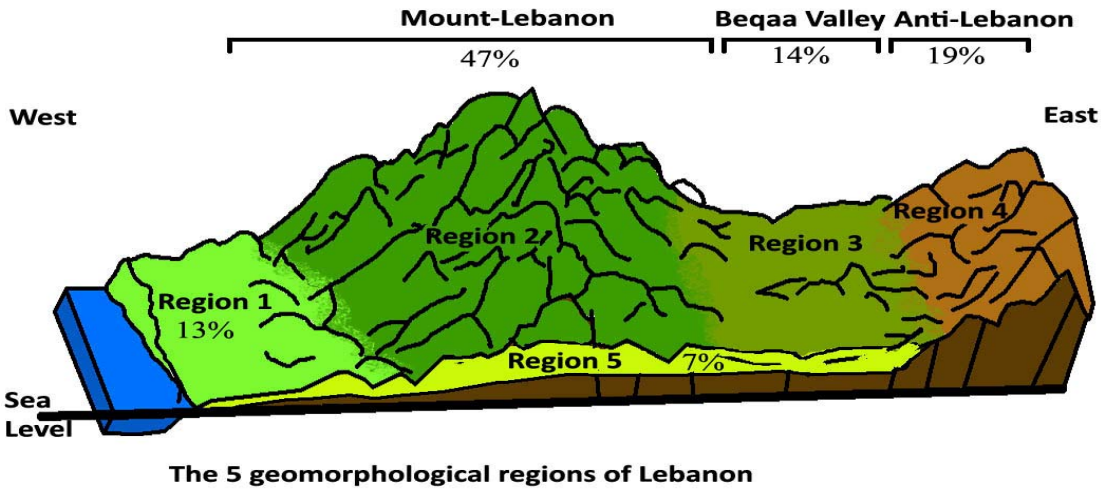


Figure 3: Schematic representation of the 5 geomorphological regions of Lebanon (source: G. R-Jaradi).

Ecologically, Lebanon has 7 phyto-association zones distributed according to the following levels (figure 4):

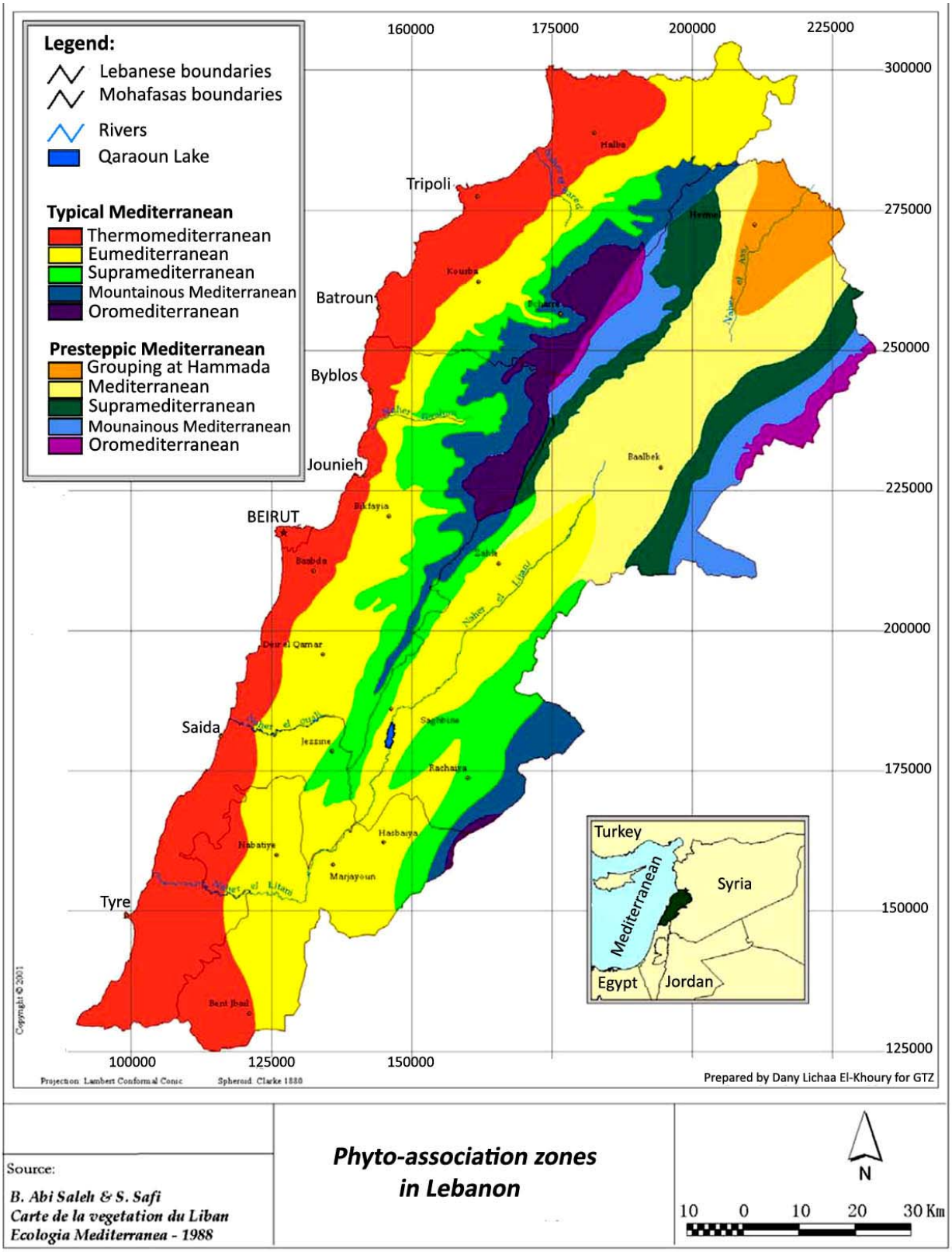


Figure 4: Phyto-association zones distributed in accordance with altitudinal levels in Lebanon (Abi Saleh & Safi, 1988)

a- **Lower Mediterranean zone or Thermomediterranean** (0-500 m altitude). It is characterized by the presence of endemic species such as *Ceratonia, Pistacia, Pinus*, and *Myrthus*.
b- **Eumediterranean zone** (500-1000 m altitude). The most abundant plant species are *Quercus, pinus*, and *Cupressus.*
c- **Supramediterranean zone** (1000-1600 m altitude). The most prevailing plant species are *Quercus, Ostryae, Fraxinus, Cystisus, Halimium,* and *Pinus.*
d- **Mediterranean mountain zone** (1500-1800 m altitude). At this high elevation, *Cedrus*, *Abies, Juniperus, Quercus,* and *Berberis* are most prominent and endemic species.
e- **Oromediterranean zone** (over 2000 m altitude). *Junipers, Rhamnus, Berberis, Pirus*, *Prunus, Daphne,* and *Cotoneaster* survive the harsh environment.
f- **Pre-steppe Mediterranean zone** (900-2400 m altitude). It is located at the east side of Mount-Lebanon and north side of Anti-Lebanon in the Northern part of the country. Degraded soils, drought and cold make it hard for phytosociological association to develop easily. The main species to be found are *Quercus* and *Junipers*.

The noted biodiversity of Lebanon is mostly the result of the geology and physiography of the landscape, the country's location at crossroads between continents and human practices over the centuries. Geologically, Lebanon consists almost exclusively of limestone. Most are of Cretaceous origin, with Jurassic limestone in some areas, principally in the south. Only in a few places, especially in the north at Akkar, do basaltic rocks appear. The softness of the limestone has allowed the 17 perennial or year round rivers as well as the 23 seasonal rivers to create impressive valleys in many places with near-vertical sides. The climate of Lebanon is Mediterranean but with some particularities caused mainly by the topography. Predominantly westerly winds bring abundant rain—principally in winter—while the summers are mainly dry. Coastal areas receive over 800 mm of rain p.a., and most montane areas over 1000 mm. Most rain falls on the western slopes of the Lebanon range, with the summits receiving less than lower areas. The Beqaa valley that is a part of the African Rift complex and Anti-Lebanon generally receive less than 700 mm and the Hermel semi-desert in the northern Beqaa less than 250 mm. According to UNESCO, Lebanon is classified a true mosaic of ecological systems broadly representing the “evergreen sclerophylic broussailles and forests” biogeographic region within a Mediterranean biome (Ramadan-Jaradi, 2006, 2008).

Lebanon encompasses the important components of the Mediterranean vegetation (*Arbutus, Ceratonia, Pistacia, Pinus, Quercus* and *Laurus*) which are relicts from the ancient forests that dominated the Basin 2 million years ago and which represent the past and present climax of the country. Additionally, cold shrubs (*Artemisia, Astralagus*, and members of Ephedraceae) and trees (*Acer, Betula, Cercis, Fagus, and Ulmus*) invaded the Mediterranean, including Lebanon, during the Pleistocene from Europe and Asia and some are still present on the Lebanese territory. Notable keystone and flag plant species in the country is the famous Lebanon cedar (*Cedrus libani*) that has been exploited since the rise of civilization in the Fertile Crescent. Whatsoever, The Lebanese natural landscape is rich, offering in total 9,119 species of which 4,633 are of the plant and 4,486 of the animal kingdoms (BCS, 1996), of which many are threatened with decline and extinction (Sattout *et* Abboud, 2007).

What is remarkable in Lebanon the gradual change from Mediterranean to continental Mediterranean and sub-desert conditions from west to east and the gradual altitudinal change from the batha (degraded garrigue) of the Thermo Mediterranean to the tragacanth of the Sub-alpine and Alpine zones through garrigues (degraded maquis) and maquis of oak and forests of pine, cedar and fir. The latter finds its southern limit of world distribution in northern Lebanon.

Lebanon waters are part of the Mediterranean Sea which is characterized by a relatively high biodiversity that is indicated by the fact that it constitutes less than1% of the world's ocean surface, while holding as much as 6% of all marine species (Quignard & Tomasini, 2000). This richness is probably due to numerous historical, ecological or paleogeographical, as well as other factors (Bianchi & Morri, 2000). The connection established by the Suez Canal in 1869 resulted in the introduction of Indo-Pacific marine organisms (Lessepsians) to the east Mediterranean (Bariche *et al*, 2007), including Lebanon where at least 67 species (nektons, nectobenthos, benthos fauna and flora) originated from the Red Sea do occur (FAO, 2008).

Within a Lebanese territorial sea (up to 12 nautical miles) of 4702 km^2 and a continental shelf of 1169 km^2 the average annual capture (excludes aquaculture) of marine fish and mollusks/ crustaceans is 3646 and 200 metric tons respectively (FAO & MoA, 2000).

1.2.2 Pressures on Lebanon's biodiversity

Much of the biodiversity of Lebanon is heavily threatened by human activities. The major pressures affecting Lebanon biodiversity are outlined below. In this section the general nature of the pressures is outlined with quantitative information when appropriate.

Habitat loss

Ample evidence indicates that human activities are eroding biological resources in the country. Habitat loss is the main source of pressure. Uncontrolled urban expansion, destruction and/or permanent alteration of the coastal zone, extension of agricultural areas, quarries and sand removal, destruction of sea bed habitats through diverse pollutants or trawling, and forest fires all contribute to habitat loss. As per the BCS in 1996, the urbanization is the main cause of habitat loss and plant species decline (figure 5).

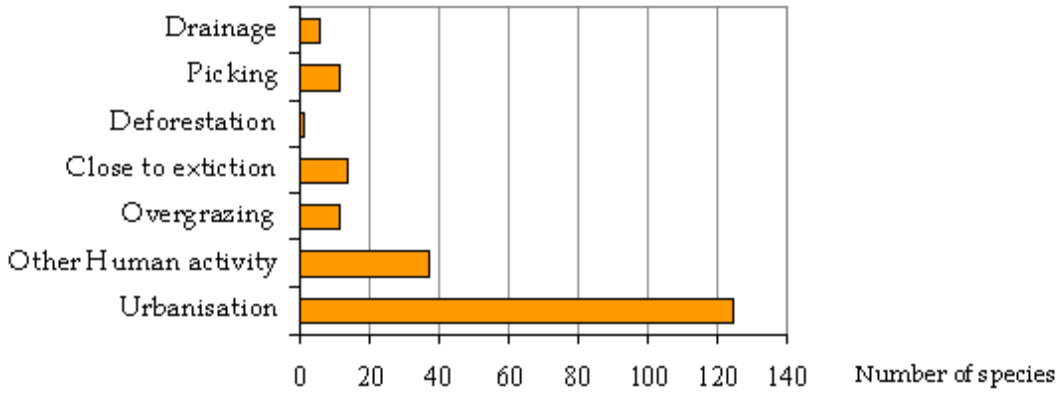


Figure 5: Causes of plant species decline.

Since habitats provide species requirements and elements of their ecological niches, their disappearance will evidently cause species decline and extinction. In Lebanon, there is a wide variety of wild animals from which some were already extinct by the beginning of the 20th century like the Syrian brown bear, the African leopard, the Persian lynx, the deer, the Arabian gazelle and the golden hamster in addition to the lion which had disappeared in the 16th century. The other species which are close to extinction include the wolf, the wild cat, the mongoose and the squirrel, whereas the rare species include three shrews, eleven bats, the weasel and spiny mouse (First National Report to CBD). Still exist a variety of species which are vulnerable like the four species of bats, the wild boar, and the common field mouse.

Habitat degradation

There are many areas of natural habitat which, although not permanently destroyed, are in sub-optimal condition owing to a variety of causes including overexploitation, overgrazing, drainage, deforestation, and poor management practices. Degraded habitat cannot support the same diversity of species as intact habitat. Most of the Lebanese reports of relevance to biodiversity highlight the expansion of degraded areas into un-degraded areas as one of the most immediate threat to biodiversity.

Invasive alien species

Invasive alien species are non-native species which have been introduced by human activities and which now propagate and spread independently in the country. Such species often invade and replace indigenous vegetation and species, thus causing a loss of biodiversity. In Lebanon, the main causes to the appearance of invasive alien species are the imported ornamental and donated forestry plants with their accompanied insects, the escapes of exotic bird species from cages and the connection of the Mediterranean with the Red Sea through the Canal of Suez. At present, the Invasive Alien Species issue in Lebanon is not of high priority, probably because their posed threat is temporary hidden, at least in the sea, by the lack of relevant studies and assessments.

Flow modification

The flow modification is probably better classified under habitat loss or habitat degradation. Whatsoever, Lebanon is a water rich country and many of the economic activities in it depend on the availability of water. Thus, the country's rivers and aquifers are heavily utilised especially during the dry season and polluted. This results in an alteration in both the volume of water flowing or stored and the quality of water flowing into rivers and eventually the oceans. In some cases flows are also increased by the discharge of effluents, mainly agrochemicals and sewage water; whereas in others, flows are disrupted by the increased water sources tapping that is practiced by villagers in an attempt to secure water during the dry season. Many rivers that used to flow quasi evenly throughout the year are nowadays varying in flow or even have low flow in summer time, a matter that negatively affects the biodiversity in aquatic ecosystems and leads to drastic changes in the number and composition of living organisms.

Harvesting

The impact of local plant varieties on Lebanese culture and economy is significant. Many aromatic plant species are extensively used in Lebanese cuisine and many people, mostly in rural areas, still widely use medicinal plants for the treatment of burns, gastrointestinal diseases, and other ailments. A Survey of Economic Plants for Arid and Semi-Arid Lands (SEPASAL) found 224 plants of economic importance distributed in Lebanon (SEPASAL, 1999). Other economic uses include local consumption (staple foods and wild edible plants), honey production (melliferous plants), landscaping (ornamental plants), and environmental uses (erosion control, agro-forestry, soil remediation, biotic indicators of pollution, etc.). While such plants are essential to many economic activities, over exploitation is potentially leading to a decline in the natural population of several plant species. For example, wild ornamental plants (and cut flowers such as the narcissus) are being harvested at liberty and perhaps at rates exceeding their rate of natural regeneration. Unsustainable hunting practices and the use of trawling for fishing are both illegal and constitute one of the main threat for the animal species in the country.

Climate change

The change in climatic conditions being experienced across the globe as a result of the increased concentration of greenhouse gases in the atmosphere since the industrial revolution also affects biodiversity. Lebanon will probably witness a significant reduction in its water resources. With increasing temperatures, precipitation will most likely shift towards rain and away from snow. Further the rain that will fall will probably come during intense storms (Farajalla, 2008). These two factors will lead to a reduction in the recharge of groundwater because there will be less snow to infiltrate into the groundwater and also because high intensity rainfall creates more runoff than infiltration. Climatic changes will most likely favour vegetation that includes more drought resistant species to be better-established and to be more abundant than other native species. Warmer climates would lead to an increase in rodents (field mice, house mice, rats, etc.) throughout the Lebanese territories. This increase will then be matched by an increase in animals that prey on rodents such as jackals, foxes, stone martins, etc. Marginal mammals will become extinct due to the loss of habitat. This is especially true for otters (such as those in the Aammiq wetlands) and other mammals that rely on waterbodies whose habitat will be severely reduced and disrupted due to the reduction in water resources. Due to the increase of warm days during the year, insect pests and vectors will be active for a longer period of time. This will enable them to reproduce more and thus to increase their populations. Climate change will probably cause bioclimatic zones to shift to higher altitudes. Various reptiles and amphibians will be impacted by such a change (Farajallah, 2008). Climate changes affect the physiology, the distribution, phenology and adaptation of birds. Trends and routes of migration of birds will also see changes. Moreover, bird communities whose distribution is limited by cold temperatures will expand beyond their natural number with warmer, more clement temperatures. Establishment of several new semi-desertic bird species in Lebanon is likely to occur (Ramadan-Jaradi *in prep.*).

Pollution

The discharge of industrial effluents into our water systems as well as the runoff from agricultural lands and urban settlements, bringing with it the chemicals leached from these areas, pollute water systems and have a detrimental effect on biodiversity. High nutrient contents caused by fertilisers or other nutrients reaching aquatic ecosystems result in eutrophication where the system becomes anaerobic and there is not enough oxygen for many species to survive. Many toxic substances also have detrimental effects on biodiversity such as the use of pesticides on fruits and vegetables or the infiltration of toxic products into the soil. Solid waste affects freshwater quality, sea grasses and marine turtles and changes the habits of fish, birds, mammals, etc and impact their distribution and growth.

Genetically Modified Organisms (GMOs)

Organisms are said Genetically modified (GM) when one or more genes, often originating from a foreign species, have been introduced to their genomes. Lebanon doesn't have any legislation concerning the traffic of GMOs or labelling of canned food with respect to genetic modifications, neither does it have any laws restricting the import of seeds used for cultivation. More importantly, almost nothing is known about the potential presence of GMOs in cultivation varieties or in food products on the Lebanese market. In 2006, the National Biosafety Framework was prepared to fulfil the requirements of the Cartagena Protocol on Biosafety (CPB) through the UNEP-GEF biosafety project executed by the Ministry of Environment and managed by UNDP and a draft decree was also prepared within the context of the same project to implement the provisions of the CPB and to provide necessary measures to regulate the transboundary movement, import, export, passage in transit, contained use, release into the environment, direct use as food, feed, and processing, handling, transportation, use in research and testing, and placing on the market, or goods containing LMOs, with the aim of protecting the environment and the humans from the potential negative effects of the LMOs.

In 2008, the first experiment on how to discover GMOs in non labelled products were undertaken at Balamand University (Bassil *et al, unpubl.* Report). Between the benefits and disadvantages of the GMOs over the human health and the environment, Lebanon is in the process of developing the knowledge about this issue. Currently there is a concern that GMOs can have a detrimental effect on biodiversity by being viable in areas that non-GMO crops are not thus resulting in additional widespread loss of natural habitat or by posing threats on wild relatives of important indigenous crops in Lebanon through cross-pollination, especially that Lebanon is a host for an enormous genetic diversity of wild relatives and landraces.

Hybridisation

Hybridisation between two closely related indigenous species, or between two subspecies or geographic forms of a single species (ecotypes), can result in the loss of unique genetic diversity found in the unhybridised individuals. This is especially problematic when organisms are transported by human activities to areas where they would not usually occur or away from their area of origin. Despite the fact that Quézel stresses on the fact that hybridisation or introgression poses taxonomic difficulties and genetic instabilities in many forest species (Quercus, Abies, Juniperus, Pinus) of the Mediterranean countries, including Lebanon, the latter offers limited measures to reduce the impact of such pressures on biodiversity. While several Lebanese retailers acquire their flowers and plants locally, many more rely on imports. Currently, there are no quarantine regulations on imported ornamentals. Likewise, thousands of trees are imported or donated annually to Lebanon for reforestation campaigns. These stocks are neither certified disease-free nor quarantined. Furthermore, imported species, such as cedars, could be genetically "contaminating" the native cedar of Lebanon, thus producing new cedar varieties. Such varieties could compete with local species in the long run or attract potentially harmful insects. In order to mitigate potential threats to local cedar populations, the MoA has banned the import and introduction of all cedar seeds and plants (Decision 108/1, dated 12/9/1995), but the implementation of the Decision remains sporadic at best.

1.3 TERRESTRIAL BIODIVERSITY

1.3.1 Status of terrestrial biodiversity

There are no National Red Lists for species in Lebanon. However, reports indicate that 81% of the floral species are terrestrial and that 96 species of them are listed as rare or threatened (BCS). Endemism in Lebanon is significant, owing to its geomorphologic diversity and the isolation effect of its diverse topography. Lebanon has a high percentage (12%) of endemic plant species, surpassed only by Turkey in a list of five neighboring Mediterranean countries. Analyses show that most of the endemic species are located on the high summits of the two mountain ranges, specifically at Mount Makmel, Mount Sannine, Qammouha, Ehden and Mount Hermon. The isolation effects characterizing these summits render the alpine uplands a reservoir for endemic species. Consequently, more than hundred species specific to Mount Hermon and the Anti-Lebanon Range have been counted. (Medail & Quezel, 1997).

A Survey of Economic Plants for Arid and Semi-Arid Lands found 224 species (10.8%) plants of economic importance distributed in Lebanon (SEPASAL, 1999).

Analyses (BCS) show that 46% of faunal species are terrestrial and that 7 mammal species are already extinct, 31% of the existing mammals are rare, 20% vulnerable and 7.5% are close to extinction species (figure 6).

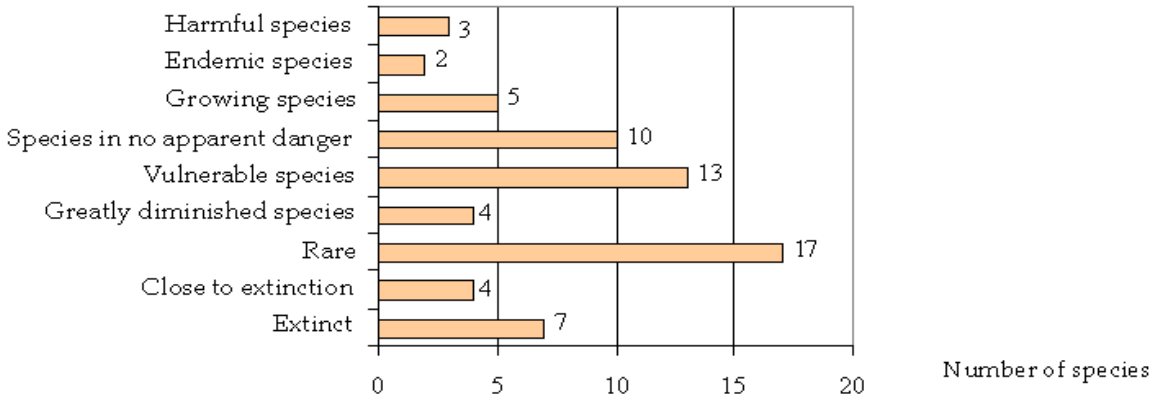
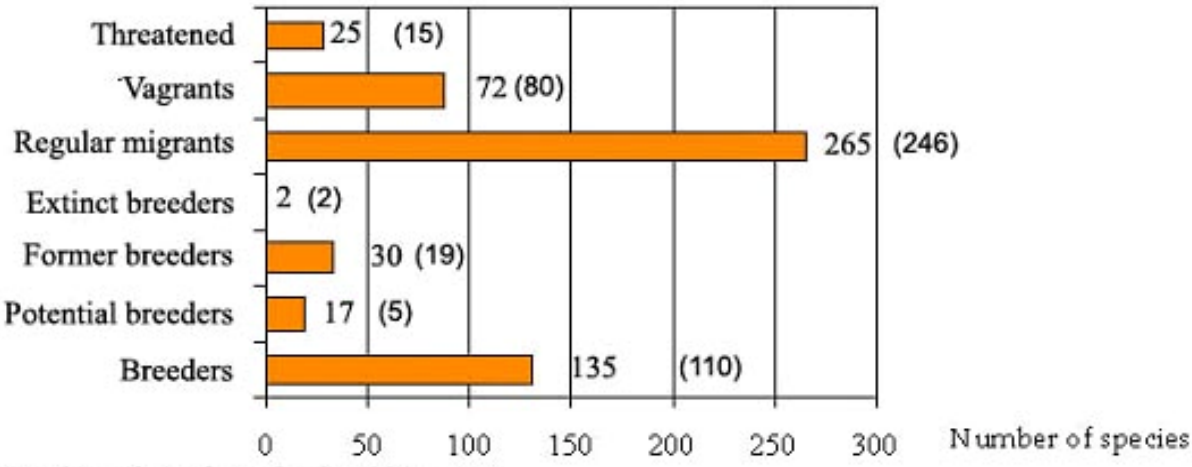


Figure 6: Status of Mammal species in Lebanon.
Ref: Biodiversity Country study (MOA/UNEP/GEF), 1996

Of the avifauna (394 species), two species (*Sterna bengalensis* and *Merops persicus*) are extirpated from Lebanon, 6.3% are threatened (figure 6) and 32% are rare. According to IUCN 2007 Red List, the threatened bird species of Lebanon include 2 Endangered, 8 Vulnerable and 15 Near Threatened species (Ramadan-Jaradi *et al.* 2008). The recent status of bird species in Lebanon is shown in figure 7, where for the ease of comparisons the inserted numbers between brackets represent the status in 1999 whereas the others represent the status in 2008.



Total number of species in 1999 = 372
Total number of species in 2008 = 394
Figure 7: Status of bird species in Lebanon (Source Ramadan-Jaradi et al. 2008).
The numbers of species between brackets represent the status in 1999 (Source Ramadan-Jaradi & Ramadan-Jaradi, 1999).

Lebanon has published two Land Use/ Land cover maps in 1990 and 2002 (see Figure 8 below) respectively based on satellite images of 1988 and 1998. As both maps did not follow the same nomenclature in the legend, it seems rather complicated to compare land use changes over this period of time. As table 2 shows, cultivated areas in 2002, represent almost 32% of the territory whereas natural areas (woodlands and herbaceous lands) add up to 56%. However, the incompatibility between the data available on both land cover maps, the one of FAO (1990) and that of (2002), represent a serious challenge for biodiversity monitoring. Lebanon is now in the process of preparing an updated 2005 land use map (CNRS 2009) on basis of Spot and Ikonos images with a methodological approach similar to the one used for the 2002 land use map.

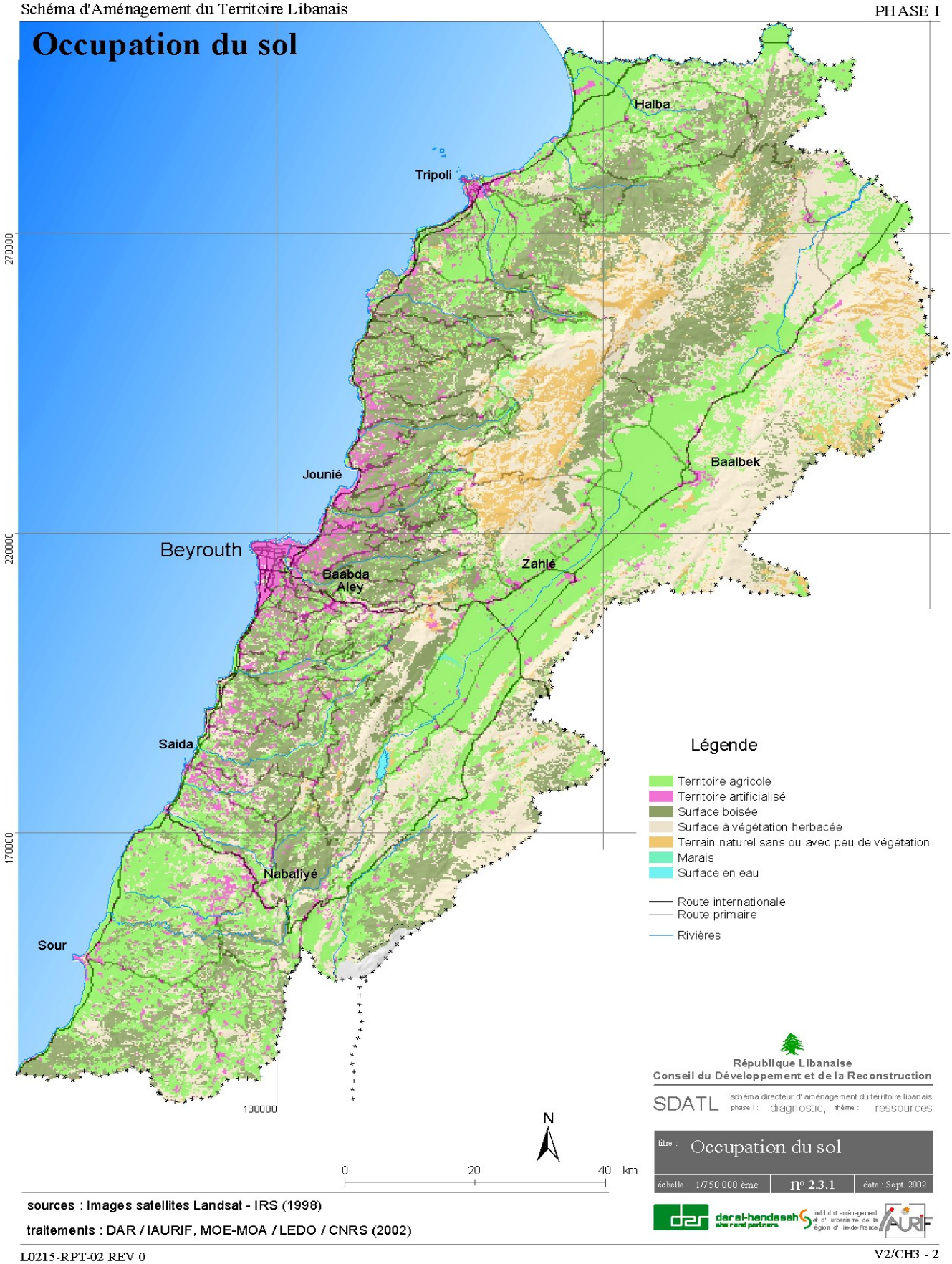


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Figure 8: SDATL 2004: Land use/Land cover map in Lebanon (2002) produced by: LEDO (MoE/UNDP/EC-Life)/MoA/CNRS/DAR-IAURIF on basis of a Landsat – IRS 1998

Land cover type	% over Lebanon
Urban areas	6.2
Cultivated areas	32.5
Forests and woodlands areas	25.2
Herbaceous areas	31
Swamps and wetlands	0.1
Unproductive areas	4.8
Water bodies	0.2

Table 2: Percentages of the various land cover classes over Lebanon
Ref: Land cover/land use map 2002. LEDO (MOE-UNDP)/MoA/CNRS/DAR-IAURIF

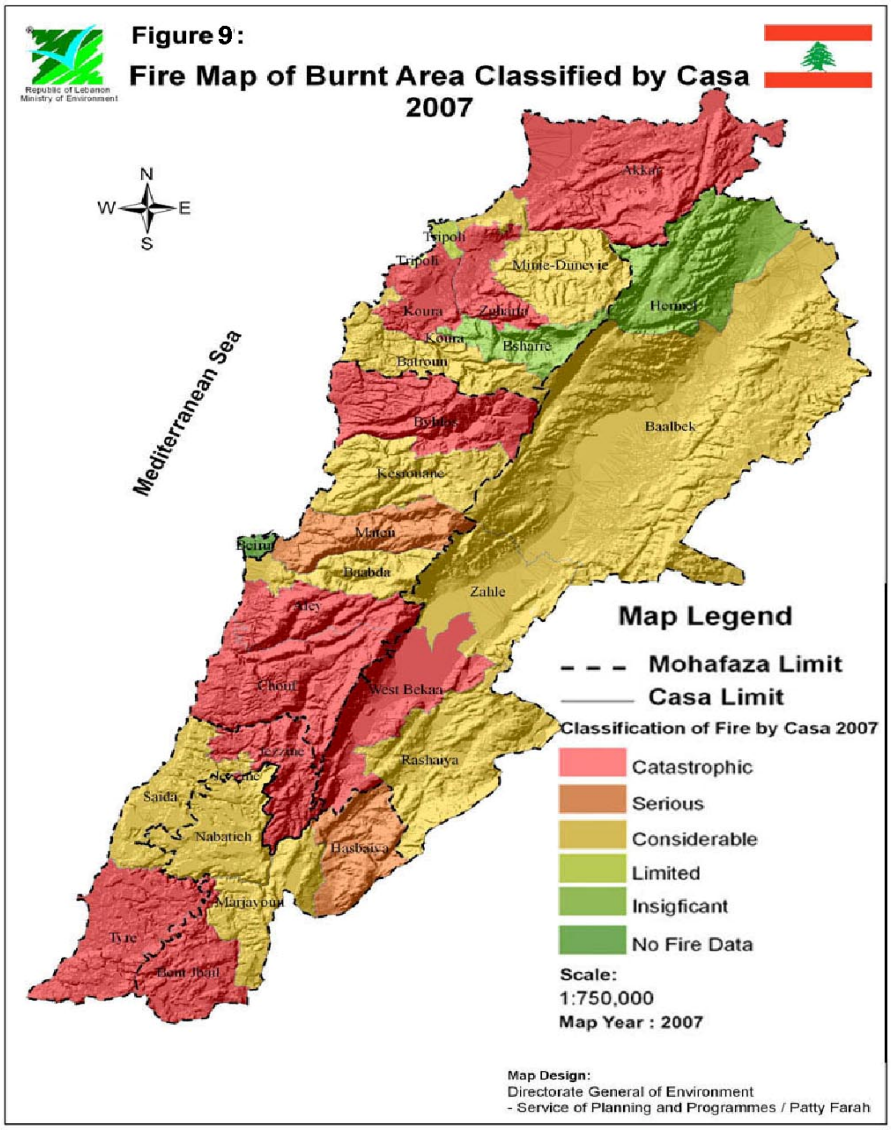
With reference to the 2002 land use map, some 1.8% of the Lebanese territory is included in the protected areas network; this network covering solely nature reserves and exclude other types of protected areas such as protected forests, natural sites and himas.

With reference to the National Forest and Tree Resources Assessment and Monitoring report issued in 2005 through a project executed by FAO and MoA (FAO, TCP/LEB/2903), forests are defined as an area of more than 0.5 ha with trees higher than 5 m and a canopy of more than 10 % coverage, or trees able to reach these threshold in situ; while all other areas spanning more than 0.5 ha with trees higher than 5 m and a canopy cover of 5-10 % are classified as other wooded lands. According to the FRA/ FAO definition, forest cover in Lebanon reaches 13% and other wooded land cover accounts for 10.3% which sums up the total of wooded lands in Lebanon to 23%.

1.3.2 Threats to terrestrial biodiversity

Lebanon is a developing country with economy in transition and thus many of its economic sectors are growing rapidly, resulting in extensive loss of natural habitat. Moreover, the civil war during 1975-1990 and later the frequently repeated periods of political tensions and instability led to chaotic behaviour and unsustainable harvest of natural resources (illegal hunting, overfishing, wood cutting, urban expansion, etc.) all over the country.
As to the rationalism of forest degradation in Lebanon, the process can be attributed to a number of direct or indirect crucial factors and practices:

- Uncontrolled tree chopping
- Forest fires (see figure 9 below)
- Overgrazing
- Quarries and crushers
- Urban spreading and migration
- Agricultural land expansion
- Climate change
- Lack of public awareness
- Wars
- Socio-economic settings



The consequences of forest degradation on ecosystems and their components may be described as immoderate and could be translated through the following:

- Soil erosion
- Loss of fauna and flora biodiversity
- Micro-climate change
- Loss of soil organic matter and soil fertility
- Desertification
- Decrease in soil water infiltration and stored underground water
- Increase in run-off which leads to mudslides and floods.

The Juniper and several oak species are preferentially felled for the production of charcoal (MOE, LEDO). Overgrazing is further threatening dwindling juniper forests and endangering its regeneration. The stone pine (umbrella pine) is chiefly threatened by urban development and forest fires. The severity of threats on some selected forest trees is given in Table 3 below:

Forest Species	Abusive Felling	Over-grazing	Urban Development	Fires	Pests	
Kermes Oak *Q. calliprinus*	3	4	3	3	-	*Lymantria dispar*
Haired Oak *Q. Cerris*	4	4	4	-	-	*Lymantria dispar*
Aleppo Pine *P. halepensis*	3	3	4	5	2	*Thaumetopoea wilkinsoni*
Brutia Pine *P. brutia*	3	3	3	5		
Stone Pine *P. pinea*	1	2	4	4	2	*Ernobius sp. , Chalcophora detrita, Phytocecia sp., Pitophtorus pubescens, Tomicus piniperda*
Cedar *Cedrus libani*	2	2	1	-	2	*Cephalcia tannourinensis*
Fir *Abies cilicica*	3	4	3	-	-	
Juniper *Juniperus excelsa*	4	5	2	-	-	
Cypres *Cupressus sempervirens*	3	4	2	2	-	

Table 3: Threats to some forest species based on degree of severity (source Biodiversity Country Study: MoA/ UNEP/GEF).

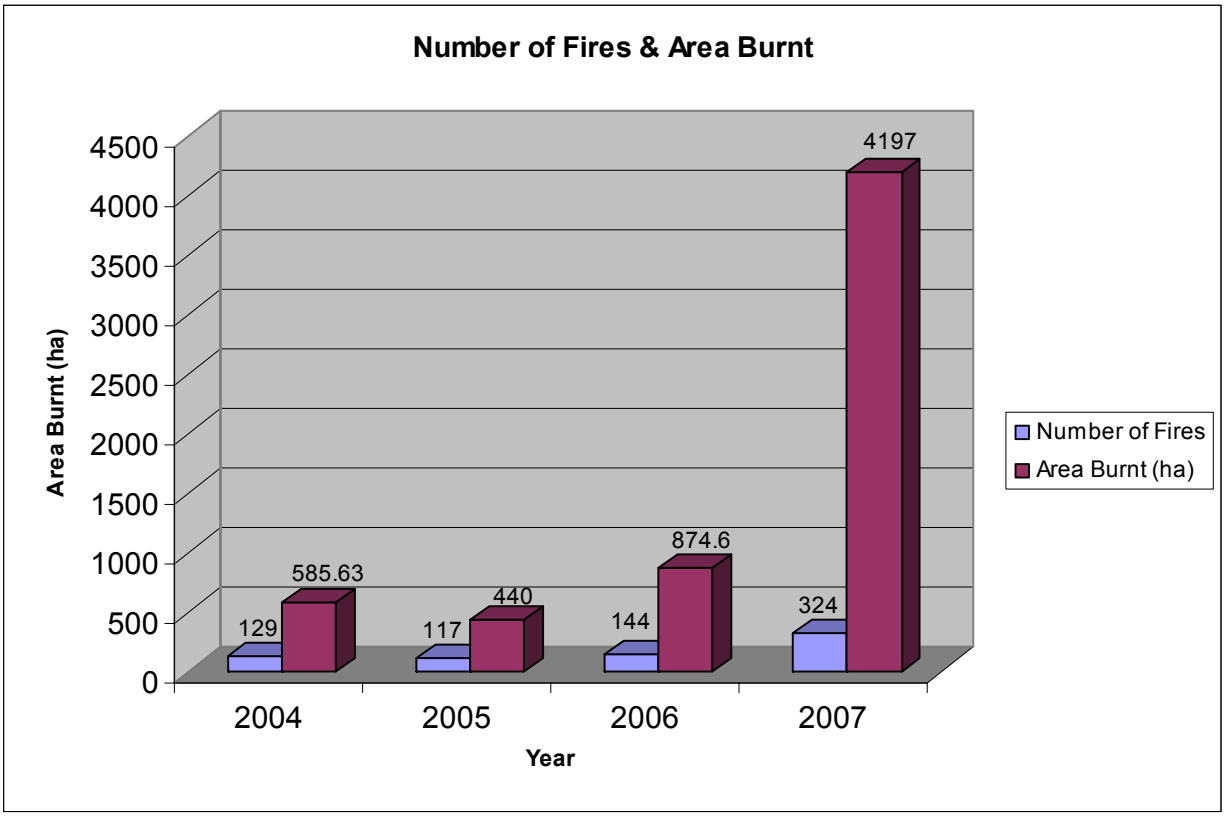


Figure 10: Number of fires and burnt areas per year during the period 2004-2007.
Ref: MoE based on the reports of the Internal Security Forces.

The most catastrophic and disastrous years on forests of Lebanon are 2007 and 2008. Figure 10 above visualizes the impact of fire on the Lebanese forests in term of number of fires and burnt areas during 2004-2007 according to a Statistical Analysis study for Fires in Lebanon done by MoE based on the reports of the Internal Security Forces.
The study recorded in 2007 a total of about 324 fires which destroyed almost 4197 ha over Lebanon (www.moe.gov.lb)

As noted above, even if natural habitat is not completely transformed or destroyed, it is often degraded into sub-optimal states. Large portions of Lebanon are grazed by sheep and goats and are thus still basically natural. Some of these areas were degraded from maquis to garrigue and then to batha. However, if these areas are allowed to degrade more through unsustainable management, they will no longer support the biodiversity they originally sustained. The area of land under grazing is much greater than that under conservation management and its sustainable management will certainly contribute to the improvement of biodiversity management.

The country's plant species are heavily threatened by a variety of threats, the most serious of which are habitat loss, agriculture and grazing (figure 11). This is clearly the case in the coastal zone that is overpopulated and heavily cultivated.

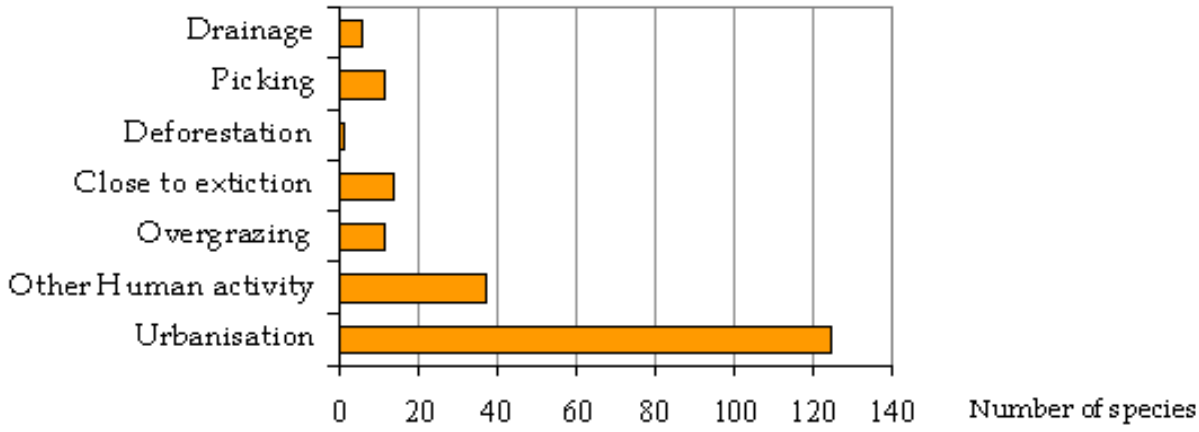


Figure 11: Number of threatened plant species per degradation factors (source: Biodiversity Country Study (MoA/UNEP/GEF, 1996).

Nearly the same types of threats affect the mammals, birds and reptiles of Lebanon where habitat loss appears to be the main threatening factor followed by chemical pollution, illegal hunting and persecution.
Unfortunately, there are no national red lists of flora or fauna species in Lebanon. Furthermore, it seems that neither the naturally hybridized nor the alien invasive species are given a weight or priority in the country.
Many of Lebanon's species are threatened by extractive use (harvesting), especially for medicinal, aromatic and culinary purposes. The estimated market value of medicinal and aromatic plants produced by forests in Lebanon is US$ 29 600 000/ year, based on 2004 figures (MoA); whereas the estimated produced nut (pine, walnut, almond) by forests is 22000 tonnes/ year, which is equivalent to US$ 868 000 000 (source: FAO, 2000).
Lebanon was known for its dense and rich forests in the ancient times. It is now witnessing a severe depletion of its natural resources. Land degradation and deforestation are not problems of the last decades only; they started more than a century ago and kept going on. The total lack of control and appropriate legislation in the last few years, the increasing needs of the population and the ignorance of the negative impacts of improper natural resources management resulted in the actual alarming situation (FAO, 2000)

The Lebanese studies on Climate Change (Climate Change: Enabling Activity Project in Lebanon, 1997-1999; Khawlie, 2001; Farajalla, 2008) identified the biodiversity sector as one of the sectors that would be most heavily affected by climate change. The expected changes in the distribution of vegetation communities may lead to the disappearance of certain vegetation associations and their replacement by others. For example, a forest may regress into a shrub land or even grassland depending on the intensity of the modification. For a 3oC temperature increase, for example, an upward shift in vegetation belts of around 545m would be expected.(CC- enabling activity project for Lebanon http://www.moe.gov.lb/ClimateChange/Climate2/exec_sum/bioclimatic.pdf). As such, there may be a 300m upward shift in the year 2020, 486m in 2050 and more than 700 meters in the year 2080.This would push the tree line in the year 2080 in both reserves to around 2500m. Moreover, natural regeneration and natural expansion of cedar forests would be severely impaired by the anticipated warming temperatures. Annuals and plants that require high soil humidity would have to speed up their growth so they would germinate, grow, flower and shed seeds before the loss of moisture. Therefore, climatic changes will most likely favour vegetation that includes more drought resistant species to be better-established and to be more abundant than other native species.

Warmer climates would lead to an increase in rodents (field mice, house mice, rats, etc.) throughout the Lebanese territories. This increase will then be matched by an increase in animals that prey on rodents such as jackals, foxes, stone martins, etc. (Farajalla, 2008).
Climate changes affect the physiology, the distribution, phenology and adaptation of birds. Trends and routes of migration of birds will also see changes. Moreover, bird communities whose distribution is limited by cold temperatures will expand beyond their natural number with warmer, more clement temperatures. Establishment of several new desertic bird species in Lebanon started already to occur (Ramadan-Jaradi, *in prep*.).

With the application of modern biotechnology, biosafety has emerged and it is identified in the international arena as an important issue of concern in biotechnology, via the adoption of the Cartagena Protocol of Biosafety (CPB), a supplementary agreement to the CBD. This concern is legitimate, because of the transfer of genes from GMOs to wild relative species and landraces, which may affect biodiversity, and/or to edible plants which may produce toxic or allergenic effects in the consumed foods.

Lebanon imports most of its agricultural materials, including live plants, and most raw and bulk foods for processing (Baalbaki *et al*., 2004). On the other hand, agricultural exports were found to be minimal, while the food industry was the biggest exporter of Lebanese products. The listed major countries of import were producers of GMOs, indicating a high probability of GMO imports. It therefore seems that risks from importing GMOs are of a higher priority than GMO exports, although GMO components of exported non-living products should be a concern. Therefore biosafety requirements have to be evaluated based on specific details of the components used (Mohtasseb *et al*., 2005)

Lebanon who participated in several preparatory meetings and negotiations of the CPB, has ratified the Protocol recently through law #44 dated 23/10/2008. Even prior to the ratification of the Protocol, Lebanon started to fulfill its provisions and developed the National Biosafety Framework (NBF) document and the draft decree on Biosafety in 2006.
Despite the evidence of working with GMOs at various academic and research institutions, almost nothing is known about the potential presence of GMOs in cultivation varieties or in food products on the Lebanese market. In 2008, the first experiment on how to discover GMOs in non labelled products were undertaken at Balamand University (Bassil *et al, unpubl.* Report in 2008).

1.4 FRESHWATER BIODIVERSITY

1.4.1 Status of freshwater biodiversity

A wide variety of organisms inhabit Lebanon's freshwater ecosystems, including invertebrates, molluscs, fish and others. The faunal species in freshwater represent 16% of the total fauna biodiversity of the country and the floral species represent 6% of the flora species only. Five percent of the country's freshwater fauna are threatened and 1.3 percent endemic (BCS, 1996). The only endemic freshwater fish to Lebanon *Phoxinellus libani* was considered extinct in the country (BCS, 1996) but later it has been observed at least in Yammouneh Lake, Litani River and Qaraoun Lake (El Zein, 2001). Many have been exterminated from particular river systems due to overfishing.

There are extensive pressures on Lebanon's inland aquatic ecosystems: water pumping, rivers channelling and pollution of various origin. Their impact on the ichtyofauna is high mortality during the drought season and abandon of preferred spawning areas (Cyprinidae, Cyprinodontidae and Cobitidae) (El Zein, 2002).

The use of freshwater resources in Lebanon is approaching unsustainable levels. This is mainly due to a lack of effective management policies, increased consumption as a result of expansion of irrigated agricultural land, escalating uncontrolled exploitation of groundwater resources, population growth and industrial development.

Protected areas in Lebanon have been designed to conserve watersheds and freshwater biodiversity. The only inland true freshwater swamp in Lebanon (Aammiq) is a privately owned marshy area but protected under the umbrella of the Shouf Biosphere Reserve and by personnal initiative of the landowners, the site was one of the two sites that were previously managed under the MedWet Coast project executed by MoE with the support of UNDP/FFEM. On the other side, most of the rivers and river valleys are declared natural sites under the protection of the Ministry of Environment through decisions issued by the Minister of Environment, however there is a need to enhance the enforcement of such decisions. The 17 perennial rivers discharge each an average of $15m^3$ throughout the year.
Table 4 represents the typical water balance in Lebanon. About 50 percent of the average yearly precipitation of 8,600 MCM is lost through evapo-transpiration. Other losses include surface water flows to neighboring countries (almost 8 percent) and groundwater seepage (12 percent) leaving 2,680 MCM of surface and groundwater that is potentially available, of which 2,000 MCM are exploitable.

Table 4: Annual water balance in Lebanon (C.Abdallah, FAO 2001; Jaber, 1994)

Description	Average yearly flows MCM
Precipitation	8600
Evapotranspiration	4300
Unexploited ground water and ground water losses to sea	880
Ground water losses to lake Haula	150
Losses to Syria:	
Assi River	415
El Kabir River	95
Allocation to Lebanon from El Assi	80
Losses to Palestine:	
Hasbani River	160
Exploitable ground water	400
Net potentially available surface flow	2280

Furthermore, the freshwater ecosystems contain 987 species, of which 656 are invertebrate species (61 species of worms, 41 mollusks, 60 crustaceans, and 494 insects; BCS, 1996).

1.4.2 Threats to freshwater biodiversity

The release of a wide variety of industrial chemicals without treatment in the water of streams and rivers and the direct discharge of the organic substances from sewage agglomerations alters the structure of biocenotic waters (BCS, 1996).

In addition, Lebanon's freshwater ecosystems are threatened by drainage, channelling and various pollution as well as by ineffective management policy, increased consumption as a result of expansion of irrigated agricultural land, escalating uncontrolled exploitation of groundwater resources, population growth and industrial development.

The traditional and future water demands vary widely because of different assumptions used in the estimation process, particularly in relation to available land for agriculture, average consumption per hectare, annual population growth, average per capita consumption, and future industrialization potential. While the numbers vary, the consensus is that there will be a deficit in the quantities of water required within the next ten to fifteen years as depicted in figure (12). Using the water balance presented in Table 4, it is clear that the total quantity of fresh water available for exploitation (2,000 MCM/year out of 2,680 MCM/year) (FAO 2001; Jaber, 1994) will result in a water shortage in the near future; A projection done by Jaber (1995), shows that there will be a water shortage of 1055 MCM during the dry period (see figure 11 below); hence the need to address the issue of water management through proper policy setting as stated by the INECO Lebanon Workshop in September 2007.

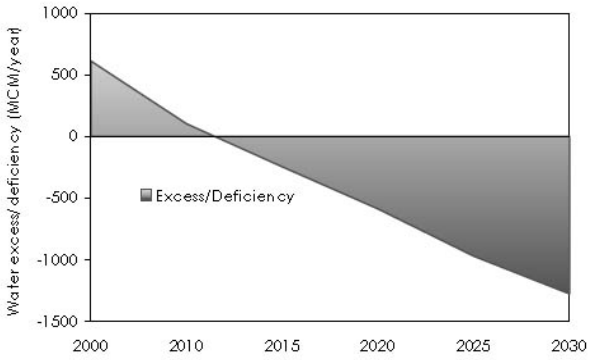


Figure 12: Lebanon's future water demand and deficit.

The political instability in the country limited the development of a comprehensive data-base for surface water. A recent study (2008) on assessing the water quality of the Qaraaoun reservoir, an impoundment of the River Litani for multipurpose utilization would serve as a prototype for the development of comprehensive plans for optimal utilization of surface water sources in Lebanon, as a venue to meet the water needs of Lebanon.

1.5 AGROBIODIVERSITY

1.5.1 Status of Agrobiodiversity

Being located in an area of mega diversity of important food crops and pasture species, wild relative species and landraces of high genetic diversity are found in Lebanon. Many major crops having wild relatives still exist in the natural habitats in Lebanon. These includes: wheat, barley, lentils, lathyrus, vetch, medics, clover, almonds, plums, pears, pistachio, onion and garlic. Drylands are especially outstanding for their within species genetic diversity. Landraces and wild relatives of indigenous crops in the Middle East region are most outstanding for their resistance to diseases and abiotic stresses, thus becoming a most valuable source for the sustainable livelihood of the local communities living in those marginal areas, as well as forming the genetic material for germplasm enhancement upon which global food security depends. The Lebanese Agriculture Research Institute, affiliated to the Ministry of Agriculture in collaboration with the ICARDA and with financial support from GEF and UNDP, implemented a 5 years project (ending 2005) focused on the conservation and promotion of important wild relatives and landraces of agricultural species by introducing and testing in-situ and on-farm techniques. The project "Conservation & Sustainable Use of Dryland Agrobiodiversity in the Near East" was launched in June 1999, implemented over four countries: Jordan, Syria, Lebanon & The Palestinian Authority (http://www.lari.gov.lb/agrobio).

1.5.2 Threats to Agrobiodiversity

Agrobiodiversity in Lebanon is under severe threat due to habitat loss and increased environmental degradation by human activities, exacerbated by climate change, leading to significant loss of these critical genetic resources and threatening global food security. Agrobiodiversity is also highly threatened mostly by the spread of modern chemical intensive agriculture which has a direct negative impact on biodiversity at all levels: ecosystem, species and genetic; and on natural and domestic diversity. The use and conservation of agrobiodiversity is the central means in assuring adaptation of humanity to climate change challenges and to provide global food security.

1.6 MARINE BIODIVERSITY

1.6.1 Status of marine biodiversity

The status of marine species was assessed within the Biodiversity Country Study in 1996 and then reviewed through several published and unpublished papers. There are 367 fish species in Lebanon. Phytoplankton encompasses 580 species whilst the zooplankton accounts for the largest share of marine faunal diversity with more than 747 species recorded. Micro-zooplanktons are at the base of the marine food pyramid and are hence essential for maintaining the ecological equilibrium. The microzoobenthos are represented with 12 known species whereas the macrozoobenthos are diversified and encompass 662 species (Bitar, 2001). Other families of marine organisms include seven species of cephalopods (octopuses, cuttlefish and squids), at least three species of reptiles (Loggerhead, Green and Leather-back marine turtles) and five species of mammals (dolphins and porpoises and, less common in local waters, whales and seals). The information on the conservation status is mainly available for selected species (Turtles and cetaceans).

In Lebanon marine species are relatively impacted by extractive use for human consumption. Average annual capture of marine fish is visualised in figure 12 (Source: Earth Trends, 2003).

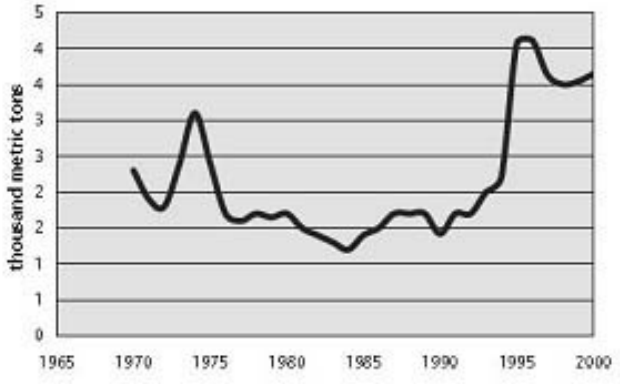


Figure 13: Average marine fish capture in Lebanon

The Biodiversity Country Study identified submerged rocky, sandy and grassy habitats as well as sciaphile, photophile, endofauna and epifauna communities, including 68 threatened species.

The coastline of Lebanon extends for approximately 250 km of which only 8.8 km2 are protected by two nature reserves (Palm Islands and Tyre Beach) that are also classified Ramsar Sites. Marine springs (off shore) create not only unique underwater habitats, but also contribute to keeping the sea clean and healthy. Like the sea, the coast of Lebanon faces several threatening factors.

1.6.2 Threats to marine biodiversity

Extractive use of marine living resources is the major threat to marine biodiversity; with numerous species of marine fish being heavily exploited.

Many species of Lebanon's marine domain will certainly be impacted by the exotic and lessepsian species as is the case of the Brown Algae *Stypopodium zonale* which invaded large surface areas on the detriment of other species of the marine habitats (Bitar & Bitar, 2001).

The current manner in which the coast is exploited is clearly detrimental and destructive, both for the coast and for the future of Lebanon. The beaches are very vulnerable and there are several areas where parts of beaches and dunes are being lost. This loss is partly due to

human development and partly to natural causes like erosion. Although development in itself is a necessary process to ensure economic growth it also carries risk and influences other sectors in the region. The loss of beaches can have a negative effect on tourism and fishing industries.The use of explosives destroys sea fauna, and causes other unforeseen problems. The direct outpour of sewage, industrial waste and household refuse without prior treatment and with no sanitary measures has transformed the Lebanese beaches into trash dumps and the Lebanese coast into underwater sewers. The removal of maritime accretions at low depths threatens the destruction of what is left of the beaches.

One of the threats resulting from exploitation of marine species is the issue of bycatch and incidental mortality. This occurs when non-target species like the endangered marine turtles or dolphins are killed by accident during fishing operations.

Marine resources are not extracted only for use as a source of food. Many fish are collected to be sold or used as aquarium fish and many shells are gathered by collectors or removed from certain areas to be released in others, affecting as such the equilibrium of the biocenoses.
Climate change effect on marine biodiversity is not clearly approached by scientists and the open system mariculture (the mass production of marine fish for human consumption) is not yet seriously practiced in Lebanon.

In 2006, 10,000 tons of heavy fuel oil has been spilled into the Lebanese sea, causing an environmental catastrophe with severe effects on health, biodiversity and tourism. It has affected more than 140 km of both public and private rocky and sandy beaches along the Lebanese coast including public and private marinas/ports for boats/ships of fishermen. The toxic oil, which covered rocky coasts, has killed algae and other organisms that fish and turtles feed on. Consequently, fishermen have reported decreased numbers of fish harvests compared to previous years. Oil, which has sunk to the sea bed reappeared in the form of tar balls and re-contaminated sandy beaches. Moreover, oiled and dead birds are still discovered in monitored places like Palm Islands Nature Reserve.

1.7 IMPLICATIONS OF BIODIVERSITY LOSS

The loss and degradation of Lebanon's biodiversity has serious implications for its society and economy. Natural ecosystems provide many essential services such as the provision of clean water and air, prevention of soil erosion, pollination of crops, provision of medicinal plants, nutrient cycling, provision of food and shelter, regulation of the gaseous composition of the atmosphere, protection of coastal zones, regulation of hydrological cycle and climate, generation and conservation of fertile soil, dispersal and breakdown of wastes, absorption of polluants and the meeting of spiritual, cultural, aesthetic and recreational needs. Large portions of the country's economy are heavily dependent on biodiversity including the fishing, livestock grazing, horticulture and agriculture based on native species, commercial and subsistence use of medicinal plants and ecotourism.

The services of ecological systems and the natural capital stocks that produce them are critical to the functioning of the Earth's life-support system. They contribute to human welfare, both directly and indirectly, and therefore represent part of the total economic value of the planet. The combined economic value of 17 ecosystem services at global level has recently been estimated in the range of US$ 16-54 trillion per year (Costanza *et al*. 1997).
However, in Lebanon the biodiversity resources as well as the ecological services that are provided by the various ecosystems are not valued yet. This is mainly due to gaps in knowledge about the direct and indirect services of biodiversity and the function of ecosystems, a matter which implicates insufficient awareness of decision makers of the value of biodiversity services and goods and subsequently absence of market values on ecological services (Sattout & Abboud, 2007).

Eco-tourism is a rapidly growing industry in Lebanon. It is a real environmentally responsible visitation to relatively undisturbed natural areas in order to enjoy, study and appreciate nature and any accompanying cultural features that promotes conservation and provides for

substantial beneficial active socio-economic involvement of local populations. Strengthened by the beauty of the country's landscapes and uniqueness and richness of its wildlife, the ecotourism in Lebanon is largely dependent on biodiversity. The loss or degradation of the latter through fire, wood cutting and overexploitation mainly during political instability will necessarily negatively impact the ecotourism industry. Moreover, the fall of snow makes Lebanon the only country in Arab world a winter resort for skiing. The climate change will not only affect this winter nature-based tourism but also the resisting biodiversity which extended its roots since thousands of years and the high rate of endemism that characterises the mountain summits.

The economic value of the different forest ecosystems in Lebanon is estimated at about 131.5 M US$ (millions of USD) (Sattout *et al.,* 2005). This includes the economic values of medicinal and aromatic plants (c.23.5 M US$) and honey production (c.17,M US$). The economic value of the legal game birds is estimated at (13.5 M US$) in term of meat and (c.6.6 M US$) in term of licenses value (Ramadan-Jaradi, 2008). The forests of the country are mainly threatened by deforestation, over-grazing, urban development, road development, bad agricultural techniques, excessive use of chemical products, illegal hunting and industrial development. If these threats persist, the situation will necessarily have grave implications for the people who use the forests and their indirect services which are not seriously considered yet.

Poor management of wetlands and rivers and the catchments in which they lie can lead to detrimental effects on water availability and water quality. Lebanon is a water-rich country and much of its economic growth depends on water. Furthermore, Lebanon has a goal to provide clean water to all its citizens. The country's economic growth and the provision of clean water to citizens are thus dependent on correct management of its catchments and wetland and river ecosystems.

Fishermen are considered as one of the poorest sectors of society with an average income of US$100 per month (MoE 2005 – CAMP/ Final Integrated Report). Lebanon has 3,000 to 4,000 fishermen. In 1996, annual fish production amounted to 4,485 tones (equivalent to 7 million US$) of which 4,110 tones of sea fish and 375 tones of freshwater fish (mostly in fish farms) (MoE, 2003 – CAMP). This production level was twice the average fish production in Lebanon over the previous 10 years, thereby, signaling a rise in fishing activities. However, the increased production still does not meet the annual internal consumption needs which is 75 million US$ of fish per year, therefore, Lebanon imports more than 10,000 tons of fish (1996), mainly from the Gulf countries, Morocco, and Turkey (MoE, 2003 CAMP). In brief, Lebanon can still improve its fish production through sustainable fishing practices which necessitates the regulation of fishing and the control of the destructive and illegal fishing gears through laws enforcement to stop dynamiting and the use of trawling or dragging lines with small mesh size. Furthermore, the preparation and implementation of oil spill contingency plan would reduce the risks faced by marine biodiversity from oil spill, including fishes, in Lebanon and would improve the availability of marine resources to those people who depend on them.

Lebanon is considered a major host for wild relative species and landraces of high genetic diversity, mainly in the dryland areas. They are most outstanding for their resistance to diseases and abiotic factors. Their disappearance will not impact only the sustainable livelihood of the local communities living in those marginal areas (drylands) but also the global food security which depends on them.
The overall socio-economic well-being of the population of Lebanon is thus directly dependent on the conservation and sustainable use of its biodiversity. Continued extensive loss of biodiversity and ecosystem health could have dire social and economic consequences. It is thus essential that sustainable biodiversity management is prioritised in the country.

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Chapter II
ASSESSMENT OF THE IMPLEMENTATION OF NBSAP IN LEBANON

2.1. INTRODUCTION

Lebanon signed the Convention on Biological Diversity (CBD) in 1992 and ratified it in 1994 (Law No. 360/94). The Ministry of Environment (MoE) developed in 1998 with the support of UNDP/GEF a National Biodiversity Strategy and Action Plan (NBSAP) thus addressing Article 6a of the Convention which calls contracting Parties to "*Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity*"

This step was highly significant; especially given that it was the first time that such a comprehensive and wide ranging planning initiative has been undertaken with respect to management of natural resources at the national level. An important consequence of this significant achievement is that it provided the basis in terms of information and policy to properly consider underlying trends and to identify priorities with respect to biodiversity. However, it was only the beginning of the planning process and the critical step remains the transformation of this strategy into action.

After the issuance of later COP decisions (and the adoption of new instruments) to guide the further implementation of the Convention, it was necessary to review the NBSAP with regards to the latest CBD requirements and provisions:

In decision VI/26 issued in 2002, the Conference of Parties (COP6) adopted the Strategic Plan for the Convention and urged the Parties "*to review their activities especially their NBSAPs in light of this Strategic Plan".* In the mission statement of the Strategic Plan, Parties committed themselves to achieving, by 2010, a significant reduction in the rate of biodiversity loss at the global, national and regional levels, as a contribution to poverty alleviation and to the benefit of all life on earth.

In addition, a provisional framework for goals and targets was adopted in 2004 by the Conference of Parties (COP8) in decision VII/30 to enhance the evaluation of progress in the implementation of the Strategic Plan in particular its mission to achieve the "2010 biodiversity target". COP8 invites Parties to incorporate the goals and targets of the provisional framework, as appropriate, into their national biodiversity strategies and action plans when these are revised consistent with national needs and priorities.

In response to these more recent obligations related to the 2010 biodiversity target, the Ministry of Environment with the support of the UNDP/GEF has revised its NBSAP in 2005 and elaborated a draft addendum to the National Biodiversity Strategy and Action Plan which aligns the proposed actions in the 1998 NBSAP with the goals and targets of the provisional framework, in addition to suggesting a time frame for execution, a responsible body as well as an expected budget for implementation.

2.2. DEVELOPMENT OF THE NBSAP AND ITS ADDENDUM

The preparation process of the NBSAP lasted for one year and involved 12 national experts and two international consultants. The development of the NBSAP was supervised by a steering committee which includes representatives from the concerned government institutions, academic institutions, research institutions and NGOs. Local communities were also actively involved in the preparation of the document: Awareness campaigns were conducted *andcommunity* participation was sought by organizing regional workshops in which approximately 500 individuals from all regions in Lebanon participated in the process.

The National Biodiversity Strategy and Action Plan (NBSAP) of Lebanon covered nine axes, elaborated as follows:

1. Terrestrial ecosystems and natural habitats;
2. Fresh water biodiversity conservation;
3. Marine biodiversity conservation;
4. Conservation of agro-biodiversity;
5. In-situ biodiversity conservation;
6. Urban biodiversity conservation;
7. Biosafety;
8. International cooperation;
9. Strategy implementation.

The NBSAP set one goal for each of the above mentioned axe, in total the strategy was based on nine major goals, fourteen objectives, with specific planned actions on the short, medium, and long term and it is supposed to be implemented by different stakeholders in the field of biodiversity.

Since its elaboration, several initiatives and activities have been undertaken, within the above mentioned different axes, to implement the actions of the NBSAP. However, and as is the case for the majority of these actions, there seems to be insufficient follow up on the mode of this implementation. Moreover, the NBSAP did not identify clear responsibility sharing for its implementation, nor did it set any specific timeframe for the execution of its actions. Accordingly, this rendered the monitoring of its execution more complex.

For that purpose, it was envisaged to elaborate on an addendum to the NBSAP that would detail its activities, set a definite timeframe for their implementation, assign responsibility, estimate the required financial resources and set indicators to allow for future monitoring and evaluation of progress in implementation. In addition to the need of an addendum to highlight Lebanon's effort towards the 2010 commitments following the adoption of the Conference of Parties of the Strategic Plan for the Convention, and afterwards of the provisional framework for goals & targets.

According to the above, a revision of the NBSAP has been performed in 2005 resulting in the elaboration of a draft addendum to the Lebanon National Biodiversity Strategy and Action Plan as follows: action sheets have been developed for each proposed action included in the 1998 NBSAP and were consolidated within the 2010 focal areas, goals and targets of the provisional framework adopted in COP decision VII/30 whenever possible. For each action of the 1998 original NBSAP - and where relevant- proposed activities were defined for its implementation in terms of research, policies & legislation and national capacity building; the civil society & public sector that need to be involved in its implementation were identified; and the needed timeframe, the estimated needed budget, and indicators were set. The 2005 draft addendum for the Lebanon National Biodiversity Strategy and Action Plan was an attempt ***to take into consideration both global needs and aspirations as well as local needs, capacities, and aspirations.***

2.3 STATUS OF IMPLEMENTATION OF THE LEBANON NBSAP

An overview of progress made in implementation of priority actions of the 1998 NBSAP will be provided in this section in an attempt to identify the status in the implementation of Lebanon NBSAP. The objectives and related planned actions set in the NBSAP under each goal of the thematic areas covered by the NBSAP, are presented in a form of a matrix with information provided on the status of implementation of each action focusing on concrete results achieved.

In addition, an alignment of each thematic area of Lebanon NBSAP with the CBD programmes of work on one hand, and on the other hand a more specific alignment of the planned actions under each thematic area with the relevant CBD articles and thematic

programmes and cross-cutting issues was also made and presented below, to provide information on how activities under the NBSAP contribute to the implementation of the articles of the Convention and the thematic programmes and cross-cutting issues adopted under the Convention.

2.4. Thematic area: Terrestrial Ecosystems and Natural Habitats

Relevant CBD thematic programme of work:

- **Dry and sub-humid lands biodiversity**
- **Forest Biodiversity**
- **Mountain Biodiversity**

Goal 1: To protect Lebanon's terrestrial biodiversity from degradation and ascertain their availability for environmental and economic benefits

Objectives	**Planned Actions**	**Relevant CBD articles and thematic programmes and cross-cutting issues**	**Status of implementation**
1. ***Provide stability for the ecosystems to permit the establishment of ecological equilibrium***	Preventing and combating forest fires	- Forest Biodiversity	A national campaign to combat forest fires was initiated in fall 2007 upon the huge forest fires that devasted Lebanon in October 2007. Accordingly, a temporary National Technical and Administrative Committee was established by the Prime Minister in 2007 for forest fires prevention, control and restoration of burnt areas. The Committee was headed by the Ministry of Environment and included representatives from concerned institutions: Ministry of Agriculture, Ministry of Interior and Municipalities (Directorate General of Civil Defense and Directorate General of Internal Security Forces), Ministry of National Defense, Council of Development and Reconstruction, the Higher Relief Council and an NGO (AFDC). The Committee has set the basis to strengthen the coordination among all concerned institutions and to unify their efforts to enhance forest fires prevention and fighting. In this regards, a MoU was signed between the Ministry of Environment and AFDC for developing and implementing an action plan for forest fires prevention and control (fighting) and rehabilitation of damaged forests. Through this partnership, several projects were mobilized from different donors (LRF, EU, Italian Cooperation, Spanish agency, private contributors) and activities were executed for the benefits of the concerned above mentioned government institutions mainly: - A National Forest Fires Strategy was developed and was endorsed by the Council of Ministers on 15 May 2009. - A Central Operation Room for forest fires was established and equipped in the

			Directorate General of Civil Defense location in order to ensure a quick and efficient action of the concerned institutions in preventing and combating forest fires, and to enhance coordination and unify the efforts of all concerned for a better forest fires management. - Equipments (fires trucks, safety uniforms, manual kits, forest fires sensors...) were provided to the Centers of Civil Defense, Forest Guards of the Ministry of Agriculture, and Army in the sensitive areas. - Establishment of necessary infrastructure such as water reservoirs, fire breaks etc… in forest sensitive areas. - Training on forest fires combating techniques and incident command system were provided to the members of the Civil Defense, the Army and the Ministry of Agriculture in addition to training about forest fires investigation to the Internal Security Forces members. In addition, training was provided to volunteers from the local communities about forest fires combating techniques and awareness sessions to the farmers about forest fires prevention and control. - A large Public awareness and Media campaigns were raised all over the Country. - Establishment of forest trees nurseries in addition to rehabilitation and reforestation of burnt areas that suffered from the huge forest fires in Lebanon in 2007 and 2008. Therefore, the most important achievements is that a coordination mechanism for preventing and combating forest fires will be set, and a national strategy for forest fires was developed in which the needed actions on short, medium and long term for forest prevention and fighting were identified and the role of each ministry and institution for their implementations were defined.
	Regulating hunting, including obligatory tests for acquiring necessary permits	- Article8: In-Situ conservation - Economics, trade and Incentive measures - Access to Genetic Resources and Benefit Sharing - Ecosystem Approach - Biological	- A new Hunting Law (Law No.580) was issued in Lebanon in 2004 to regulate hunting practices and to integrate sustainable hunting in Lebanon. The law established a “Higher Council of Hunting” (HCH) under the guardianship of the Minister of Environment and including representatives from: the Ministries of Agriculture, Interior and Municipalities, Justice, National Defense, Finance, National Center for Scientific Research, environmental NGOs, the Syndicate of Hunting Weapons and Ammunitions, Lebanese Federation for Shooting and Hunting in addition to an environmental specialist in birds and mammals.

		- Diversity and Tourism	-The law stipulates that decisions are to be issued by the Minister of Environment after consultation with the "Higher Council of Hunting" for defining hunting season and the permitted time for hunting, taking into consideration the principle of sustainability of natural heritage stipulated in the international agreements and conventions ratified by Lebanon whereby hunting is prohibited in the reproduction season and during the migration towards the breeding grounds or during the rearing period. In addition to decisions that identify animals and bird species for which hunting is allowed or banned, with special care for rare, endemic or threatened species including those mentioned in the IUCN Red list and the relevant international treaties ratified by Lebanon. In addition to decisions that define the criteria and conditions for the obligatory test that must undergo each applicant for a hunting permit for the first time, as well as the criteria and standards of the institutions and special clubs allowed to give the hunting test. However the law is not operational yet since it needs the elaboration of its implementation decrees, these decrees along with the needed ministerial decisions under the hunting law are currently in process of preparation by the Ministry of Environment (MOE) and the Higher Council of Hunting which is under the guardianship of MoE.
	Establishing ecological tourism associated with public awareness and environmental education	-Sustainable use of biological diversity - Economics, trade and Incentive measures - Ecosystem Approach - Biological Diversity and Tourism	Ecotourism activities were initiated in all existing nature reserves and large awareness campaigns were undertaken to encourage bed & breakfast initiatives in the different villages, as well as tour operators were invited and encouraged to include ecotourism on the programs they offer. The number of small eco-tour outfitters has increased during the last past years in Lebanon at level of private sector and NGOs. These tour operators promote responsible tourism by organizing trips that allow exploring the country's natural beauty and World Heritage Sites offering the chance for visitors to interact with biodiversity and local cultures while minimization negative impacts on surrounding natural environment The Lebanon Mountain Trail (LMT) (2006-2008) developed the first national hiking trail in Lebanon, stretching 440 Km from Qbaiyat in north Lebanon to Marjaayoun in the south, traversing 70 other towns and villages and countless natural and cultural monuments. The LMT project was conceived and implemented by ECODIT, a private environmental firm, with grant funding from USAID. The LMT is the first initiative of its kind to promote socially- and environmentally- responsible tourism at the national level. The purpose of this project is to

			expand economic opportunities in trailside communities (small enterprises, guesthouses, local guides, other support services) and bring people closer together from Lebanon, the Arab world and beyond. At the request of the Ministry of Environment, ECODIT conducted a Strategic Environmental Assessment (SEA) of the LMT project. As part of the SEA study, the LMT project team produced a preliminary inventory of flora and fauna near the trail. This information is presented on the LMT website (www.lebanontrail.org) and in "A Guide to the Lebanon Mountain Trail." The mandate of the newly established LMT Association is to protect and promote the LMT for generations to come. Aiming at encouraging the exchange and build on public awareness on the importance of biodiversity, a network of lodges in the area or Hermel, Akkar and Donniyeh has been created by Mada NGO in 2007; it is composed of different lodges interested in engaging in responsible tourism activities as well as sharing resources, clients and experience. All lodges have different approaches toward their touristic role but are all committed to improving their lodges in regards to environment protection, service quality and fair redistribution of wealth into the community. Many NGOs have associated public awareness and environmental education with the ecotourism programme that they are promoting e.g. The NGO “Society for the protection of Nature in Lebanon” (SPNL) has been working on promoting eco-tourism in IBA sites and on raising public awareness about those areas. In addition, SPNL has worked since 2004 on the revival of the “Hima” system in several important biodiversity areas of Lebanon, which is a traditional community based protected area system that was practiced at the time of the Arabic peninsula. SPNL has developed a strong partnership with an eco-touristic private company “The Lebanese Adventure” aiming to develop a master eco-tourism plan for the announced Hima sites and raise public awareness about their biodiversity importance. In addition, eco-tourism has been used as a mean to provide income generation for the local communities of the “Hima” sites and support their livelihoods. SPNL has been working also on raising environmental awareness in the Hima sites.
	Legislate to eliminate the conflict of interests between the governmental institutions.	- liability and redress	The legislation related to the mandate of each ministry defines its clear role, and points out when mentioning common tasks, the execution of said tasks in coordination with relevant ministries and institutions. However, a clear mechanism of coordination is not set.

	Identification of the potentialities of the Lebanese natural habitats and terrestrial ecosystems.	- Sustainable use of biological diversity	PAP/MAP/UNEP prepared and published in July 2003 a Guide entitled *"Good Practice in tourism Carrying Capacity Assessment"* and made it available for consultation at the Ministry of Environment documentation center.
	Creating Land-zoning maps.	- Sustainable use of biological diversity	In recent management plans of existing nature reserves and biosphere reserves, land-zoning maps are produced with a variety of zones like research, experimentation, regeneration, rural development, enclave, ecotourism, rangeland, green farming, and recreation zones, etc. A National Master Plan for land Management (Shema Directeur d'Ammenagement du Territoire au Liban "SDATL") was prepared for Lebanon by the Council for Development and Reconstruction in 2004. This Master Plan identifies the land use categories over the Lebanese territory and specifies among others the zones of ecological characteristics. The Council of Ministers (CoM) approved recently the adoption of this Master Plan in its Decision # 1 dated 26 February 2009. Based on the CoM decision, the related decree endorsing the Master Plan is in process of issuance.
	Protection of remarkable natural habitats, characterized by their ecology (endemic species, uniqueness…), their historical and /or socio-cultural and background (cedar forests, the valley of Qannoubine called "the valley of the Saints", Aammiq wetlands ...)	-In-Situ conservation -Sustainable use of biological diversity -Ecosystem Approach	There are seven Nature Reserves protected by Laws for their outstanding habitats and ecology and specific biodiversity importance, these nature reserves include two important cedar reserves: Al Shouf Cedars and Tannourine Cedar Forest, three mountainous forests: Horsh Ehden, Bentael and Yammouneh, one marine: Palm islands and one coastal: Tyre Coast, the two latter are declared also as Ramsar sites. Additional two sites are awaiting to be declared as nature reserves (Al Rihane Mountain and Kammouaa). Two other sites are declared in Lebanon as Ramsar sites but are not nature reserves, one coastal and marine Ras el – Chaqaa and one inland water: Aammiq wetland which it is a private property. Although Aammiq wetland is not declared yet as nature reserve, it is protected and managed through private initiative in coordination with MoE. Under UNESCO-MAB Programme, three sites are designated as biosphere reserves as follows: 1) Al Shouf Cedars including Aammiq Wetland & Aammiq village, 2) Jabal Rihane and 3) Jabal Moussa. The declaration of Jabal Rihane in 2007 and Jabal Moussa in 2009 as biosphere reserves increased the surface area of the protected habitats from 1.8% to 3.74% of the Lebanese territories. Other sites of historical, natural or socio-economic importance are listed under the UNESCO World Heritage list such as the valley of Qannoubine called "the valley of Saints" listed as cultural landscape and the forest of "Arz el Rab" or "Cedars of God" both located in North Lebanon.

			Fifteen sites in Lebanon are also highlighted for their importance for bird species and are declared as Important Birds Areas (IBAs) by Birdlife International among which 11 sites were recently added to the national inventory of IBAs in Lebanon. The identification of these 11 new IBAs in Lebanon was the result of a three year scientific national survey (2004 – 2008) carried out by two local NGOs: SPNL and A Rocha Lebanon. In addition many sites (river streams, valleys, sinkholes, forest etc,..) are declared as natural sites and landscapes under the protection of the Ministry of Environment through ministerial decisions issued by the Minister of Environment, but no actions for on site management are being done and their status of protection is different than the nature reserves. Fourteen touristic sites protected by the Ministry of Tourism for their natural landscapes and historical monuments. In 2006, the Ministry of Environment has developed a National Action Plan for Protected Areas (NAPPA) that accounts for the need to perform national surveys to identify key remarkable natural sites to be included in protection initiatives. The NAPPA is in the process of being implemented depending on the availability of funds. A local NGO “SPNL” has been working on the revival of the “Hima” system which is a traditional community based protection system practiced at the time of the Arabic Peninsula. The importance of this system is that it realizes the role of the local communities in the management of natural resources. It is important to note that the Ministry of Environment has adopted the Hima approach as a protected areas subcategory in the draft decree for the new classification system of protected areas in Lebanon. Since 2004, SPNL has revived the Hima system in five important biodiversity sites in Lebanon so far: Ebel Saqi forest in South Lebanon, which is an important route for migratory birds and an IBA, Qolielieh and Mansouri coasts which are important for sea turtles and Hima Kfar Zabad and Anjar Wetland in the Bekaa which are announced as an IBA and they lie on the flyway of migratory birds and represent an important habitat for water-birds which are listed under the AEWA agreement.

	Develop, finalize and monitor an Exhaustive Database, Regular updating of this data bank would ensure a preventive approach towards the moderation of the impacts of natural hazards as well as a quick response to anthropogenic environmental changes.	- Identification and Monitoring	To date, the only national assessment on biodiversity has been performed and published by the Ministry of Agriculture in 1996. Since then, no monitoring or updating have been performed at national level. However, initiatives in nature reserves have thrived to develop local databases on flora, avifauna and sometimes mammals: biodiversity assessment and monitoring were performed in these sites by MoE with technical assistance of the Lebanese University in 2004 and have generated biodiversity database in these sites. In addition, the nature reserves management teams have been trained on monitoring, and monitoring manuals have been developed but are not systematically followed nor are databases updated regularly. More details on Protected areas are given in appendix 3
	Rehabilitation of abandoned or degraded zones		Although legal texts regarding quarry exploitation as well as the National Action Plan for combating degradation and desertification, specifically mention the need to restore/ rehabilitate degraded areas to restore biodiversity and ecosystem functioning. Little or no action was effectively implemented in Lebanon in this regard. At the level of diverse projects activities, rehabilitation of lands used several methods such as rehabilitation of old abandoned terraces, proper mechanization, use of less harmful pesticides, growing of suitable cover crops, crop rotation, adequate forest management), etc. most efforts were oriented towards rehabilitation of existing irrigation networks and improve irrigation schemes in agricultural lands. The Agrobiodiversity project has also achieved activities related to rangeland rehabilitation: It has established several demonstration sites in Aarsal and Nabha to show the effect of protection, reseeding with native legumes and water-harvesting techniques on rangeland rehabilitation. In 2001, the Lebanese Ministry of Environment was handled the prerogative of initiating the National Reforestation Plan (NRP), aiming at the restoration of the country's green cover loss throughout the years. Accordingly, the Ministry of Environment has developed the NRP in 2001 and started its execution since 2002. During the selection of reforestation sites, specific criteria such as degraded rangelands were targeted. The reforestation activities covered about 600 Hectares of degraded rangelands and abandoned lands in all Lebanese regions and were executed from 2002 till 2006 through two consecutive phases with funds from the National Budget.

			In 2009, the Lebanese Ministry of Environment has launched the third phase of the reforestation activities, and initiated with co-funds from the Global Environment fund and collaboration of the United Nations for Development Program a project on "Safeguarding and restoring Lebanon's woodland resources" as a further step to complement the on-ground investments undertaken under the National Reforestation Plan. The objective of this project is to develop a strategy for safeguarding and restoring Lebanon's woodland resources and assist its implementation through capacity building and execution of appropriate Sustainable Land management (SLM) policies and practices. Within the context of this project, airplane seeding of forest native species seeds was carried out in about 160 hectares in 11 sites in different rural regions, furthermore reforestation of 55 sites of rangelands in different regions is planned to be executed in the upcoming fall season in 2009. Furthermore, the national campaign on forest fires launched in 2007 and executed till present, covers the rehabilitation and reforestation of burnt forest areas and rangelands. The Ministry of Agriculture has worked on flood management in pilot sites in Northern Bekaa area which is an area threatened by heavy floods following torrential rains in the Anti-Lebanon mountains and where severe soil erosion was reported in addition to substantial agricultural damage and destruction of several aqua farms. The absence of proper land management, uncontrolled grazing practices, and high land degradation in this area are not only contributing only to the problem of flash floods, but also leading to a high risk of rapid desertification in the area: In 2006, a pilot project was launched in Al'Qaa region by the Ministry of Agriculture and the German Agency for Technical Cooperation (GTZ), in collaboration with the Arab Centre for the Studies of Arid Zones and Dry Lands (ACSAD). The project handled 18 km^2 watershed area and established check dams, contour bunds and stone walls in addition to 3 collection lakes ranging between 20,000-40,000 cu. meters in volume. Early observations recorded after the recent torrential rains in 2007 showed a good level of flood prevention in that location. In 2008, the Ministry of Agriculture launched the first phase of a "Flood Risks Management" project in collaboration with the UNDP. The project is funded by the Spanish government through the Lebanese Recovery Fund and

			targets a watershed of 94 km^2 that affects primarily the villages of Aarsal and Fakhe in North Bekaa. In 2009, the second phase of the project was launched for a 200 km^2 watershed that affects the village of Ras Baalback. The project aims at supporting early recovery efforts in the area of Baalback-Hermel through the implementation of a flood risk management plan. The plan is based on the construction of stone walls, check dams and water collection reservoirs to prevent runoff water from reaching villages and farms and through the restoration of land cover to reduce soil erosion. However, no specific land rehabilitation is being implemented at national level in Lebanon. Some local NGOs have worked on rehabilitation of specific sites such as the Society for the Protection of Nature (SPNL) which has been working on the rehabilitation of "Hima" Kfar Zabad wetland in the Bekaa. The aim of the Rehabilitation plan is to revive the lost wetlands which are essential for the recovery of the ecosystem and for the attraction of waders which were present in the wetland before it was degraded. The Rehabilitation plan was developed with assistance of an expert from RSPB.

	Reforestation, along with related issues as forest management, plant nurseries, choice of species to be used in this process.	- Forest Biodiversity	The Lebanese Ministry of Environment has initiated since 2001 the National Reforestation Plan (NRP), aiming at restoration of the green cover loss throughout the years. This covered till present the execution of two phases of reforestation activities from 2002 till 2006 through national funds, where reforestation of about 600 hectares fairly distributed over 45 reforestation public sites (localities) in the five Lebanese governorates was carried out. Special care was paid to the selection of the forest species where only native forest trees was used in the reforestation activities and species were selected according to the ecological requirements of the sites and socio-economic needs in order to rehabilitate the local ecosystems and generate incomes for the local community. The third reforestation phase just started in 2009 with co-funds from the Government of Lebanon and GEF through the project "Safeguarding and Restoring Lebanon's Woodland Resources" executed by MoE and implemented by UNDP. With a total budget of 2,255,000 USD, the long-term goal of this (2009-2014) project is to complement the on-the ground investments undertaken through the National Reforestation Program through the creation of an enabling environment and by building capacity for sustainable land management as a contribution to greater ecosystem stability, enhanced food security and improved rural livelihoods. The rationale is to remove the institutional, economic, technical barriers to Sustainable Land Management (SLM) in this sector in order to enable National Reforestation Plan to meet its targets and up-scale forestry Sustainable Land Management models and approaches over 20 years at the national scale, The immediate objectives is to develop a strategy for safeguarding and restoring Lebanon's woodland resources and assist its implementation through capacity building and execution of appropriate SLM policies and practices. Airplane seeding of forest native species seeds was carried out through this project in about 160 hectares in 11 sites in different rural regions, furthermore reforestation of 55 sites of rangelands in different regions is planned to be executed in the upcoming fall season in 2009.
	Encouraging and supporting research projects (fundamental as well as applied) related to the specific goals set for the development of terrestrial ecosystems.	- Research and Training	The National Council for Scientific research (CNRS) Lebanon, has been encouraging and supporting research projects focused on biodiversity for more than 10 years, either through its PhD grant program or via the annual Grant research program. The CNRS allocates yearly a budget of 600 000 USD, to support PhD research grants and approximately 175 000 USD for the research grant programs; out of which 2 or 3 PhD per

	.		year are oriented towards biodiversity topics, and 1 or 2 to subjects related to fresh water biodiversity. The American University of Beirut (AUB) has been delivering degrees in Ecosystem management since 1998, specifically: BS of Science in Landscape design and eco management, BS in Environmental management, Masters in environmental and water ressources engineering, Public health, epidemiology, Population health, Ecosystem management, Environmental technology, Environmental policy planning as well as PhD in environmental and water ressources. The Interfaculty graduate Environmental Sciences Program at AUB includes as well a specialization in ecosystem management. In AUB, the Initiative for Biodiversity Studies in Arid Regions (IBSAR) was initiated in 2003 as an outreach and a research department. The University of Balamand delivers BS and MS degrees in Environmental sciences. The University of Saint Joseph, initiated in 2007 a Master in Environmental management "Sciences et Gestion de l'environnement" and the University of Saint Esprit Kaslik delivers a master in biotechnology and biodiversity since 2007 and recently, the Lebanese University initiated in 2008 a master in environmental management, the Lebanese American University (LAU) offers a Master in Environmental Engineering. The GEF/UNDP "Agrobiodiversity" project and the GEF/UNEP "Tannourine" project supported both the building of capacities of eight graduate students (four by each project), in following Masters studies in ecosystem management and biodiversity.
	Providing qualified staff to carry out efficiently the Identified measures, on condition that necessary funds are to be ensured properly.	- Research and Training	All Staff involved in biodiversity management, from the Ministry of Environment, Ministry of Agriculture (Forest guards) as well as staff within the Nature reserves, IBAs and "Hima", followed sustained training and capacity building sessions aiming at enabling them to gain necessary measures and skills for proper biodiversity management. The latest training was provided for the Nature reserves' management teams and the MoE staff about insect trapping in 2007 and 2008 and was organized through the project "Integrated management of cedars forest in Lebanon in collaboration with other Mediterranean countries" financed by GEF/UNEP, executed by the American University of Beirut under the supervision of MoE. The Ministry of Environment has developed in 2006 a training need assessment aiming to optimize and better organize training for Nature

			Reserve management team. The Ministry also developed and published detailed job description for staff involved in Protected areas in order to improve personnel recruitment. At the Ministry of Agriculture level, no specific training targeting biodiversity conservation were dispensed, however trainings were provided on Law enforcement, forest fires, fire prevention and fighting, fisheries and specifically fish species identification (provided by the FAO) as well as on the use of GIS and GPS which have indirect secondary benefits on biodiversity. Intensive sets of trainings were concentrated on the period of 2004- 2005 during the Forest Ressources Assessment project executed by MoA and FAO. Aiming to ensure that qualified staff is efficiently carrying the necessary measures related to forest biodiversity conservation, the forest guards of the Ministry of Agriculture follow 4 to 5 yearly sessions oriented to forest fires prevention. In addition, within the context of the national forest fire campaign initiated since October 2007, much training were provided to target institutions as well as farmers and local communities through the different projects executed within this campaign by MoE and a local NGO AFDC. These trainings include: - Training on forest fires combating techniques and Incident Command System to the officials of Civil Defense, the Army and the forest guards of the Ministry of Agriculture. - Training on forest fires investigations to the Internal Security Forces officials - Training to the volunteers from the local communities about forest fires combating techniques. - Awareness campaigns to the farmers on the prevention of forest fires. Furthermore, SPNL through the Sustainable Hunting Project offered training courses to the staff of nature reserves, forest rangers, and law enforcement officers. Trainings included introduction to bird ecology & importance, bird identification skills, conservation issues, IBA monitoring techniques and the hunting law.
	Solving the problem of overgrazing: identification and promotion of adequate fodder plants and pasture areas.	Biological Diversity of Dry and Sub-Humid Lands	The forest law (1949), Close 109, forbids grazing in cut and burned forest for a period of ten years. the Ministry of Agriculture is currently thriving to widen this legal binding to cover also forests sites impacted by fire events. By its mandate, the Ministry of Agriculture has authority to monitor and regulate grazing on public lands but has also

			been granted authority to issue ministerial decisions forbidding access on private lands upon written request of the landowners. Nonetheless, no data is available on the carrying capacity of the pasture in Lebanon and accordingly no control on grazing pressure is being applied. Traditionally, local communities used to apply a grazing management system on pasture which respected the inherent carrying capacity of the ecosystems and the Hima system of protected areas in Lebanon is building on this know how of the local community to promote sustainable use of natural ressources within municipal lands. Most of the efforts undertaken by NGOS in Lebanon and aiming to reduce grazing pressure build on awareness raising towards local communities and close collaboration with farmers and shepherds especially in sensitive areas. Within the GEF/UNDP Project on "Conservation and Sustainable Use of Dryland Agrobiodiversity in Lebanon", known as "Agrobiodiversity project" which was executed by the Lebanese Agriculture Research Institute (LARI) from 1999 till 2004, many species targeted by the project are wild relatives and landraces varieties including cereals, forage legumes and wild fruit trees. The project established several demonstration sites in the drylands of the Baalbeck caza, Bekaa valley, in three main sites, namely Ham/Maaraboun, Aarsal and Nabha. These areas are selected as demonstration sites to solve problems of overgrazing because they were experiencing a quick loss in their Agrobiodiversity due to habitats conversion, adoption of new varieties and overgrazing. Within this project, rotational grazing were practiced and fattening units were established and provided with agricultural fodder.
	Scientific and technical studies to promote development and sustainable use of medicinal plants and melliferous species.	-Sustainable Use of biological diversity	The Agrobiodiversity project mentioned above has a major study component dealing with promoting alternative sources of income in the project target area (villages of Aarsal, Nabha, Ham and Maaraboun), of which the use of wild species for medicinal purposes is an important aspect. The project "Mainstreaming Biodiversity Management Considerations into Medicinal Plants Production Processes" (LARI/GEF/UNDP) which started in July 2008 (4 years project), aims at introducing a certification system for sustainable harvesting and integrating conservation objectives into the gathering, processing and marketing of globally significant wild Medicinal and Aromatic Plants (MAPs) in Lebanon. The project will follow the ISSC-MAP standards which provides a framework of principles and criteria that can

			be applied to the management of MAP species and their ecosystems, serve as a basis for monitoring and reporting on these species, and recommend requirements for certification of sustainable wild collection of MAP resources. This would help ensure the long-term survival of MAP populations in their habitats while respecting the traditions, cultures, and livelihoods of all stakeholders. Other technical studies and initiatives regarding development and sustainable use of medicinal plants and melliferous species are carried out by some NGOs and also through private initiatives.
	Protection and management of the ripisylves.	- Biological Diversity of Inland Freshwater	Out of the 17 major rivers in Lebanon, 8 are protected by Decisions of the Minister of Environment on basis of the law of 1939 for the protection of Natural sites. Other rivers or streams are also protected within the biosphere reserves. The protection of rivers through the mentioned ministerial decisions extends from the crenons to the outlets and covers at least 500 m on both sides of the rivers, including of course the riparian (ripisylvic) habitats. However, the enforcement of this protection through these ministerial decisions is shyly applied. However, the Government of Lebanon through its various institutional structures requires some management regulations measures, including environmental conditions for infrastructure or any projects in these protected natural sites or if needed requires environmental impact assessment (EIA) and strategic environmental assessment (SEA) studies before allowing any activities in these classified sites and still impact assessment is requested when needed in the sites even not officially classified as protected.
2. ***To manage forests and ranges for productivity and sustainability****.*	Establish a forest management plan.	- Forest biodiversity	The Ministry of Agriculture is the tutelage body in Lebanon responsible for Forest conservation, management and sustainability. At National level, no forest management plans were developed, at the exception of those related to communal lands and specifically oriented to exploitation purposes, in which case the Management plans target sustainable use of existing forest ressources. The Project of “Assistance to the Plant Cover Protection in Lebanon” funded by EU in 1999 has prepared three management plans for three forest sites in Lebanon (Hadath el Jebbe, jabal Moussa and Kefraya). Regarding forest fires, the project "Towards developing and implementing a national strategy for forest fire management in Lebanon" falls in the framework of the national campaign to combat forest fires and recover Lebanon forest areas. This campaign is

			implemented by the Ministry of Environment and a local NGO the "Association for Forests, Development and Conservation" (AFDC) in coordination with a National Technical and Administrative Committee on forest fires established by the Prime Minister in October 2007 upon the huge forest fires that occurred in Lebanon. The project contributes to the national efforts being done in this regard at institutional and national levels. The project that was initiated in 2008 and funded by EU have resulted in the development of a national strategy for forest fires which was sent to the Council of Ministers in March 2009 and is awaiting official endorsement.
	Build up capacities that are are currently poor.	- Forest biodiversity - Research and Training	All Staff involved in biodiversity management, from the Ministry of Evironment, Ministry of Agriculture (Forest guards) as well as staff within the Nature reserves, followed sustained training and capacity building sessions aiming at enabling them to gain necessary measures and skills for proper biodiversity management, forest management and nature reserves management. The latest training provided in 2007 and 2008 by MoE was related to Insect trapping. The Ministry of Environment has developed in 2006 a training need assessment aiming to optimize and better organize training for Nature Reserve management team. The Ministry also developed and published detailed job description for staff involved in Protected areas in order to improve personnel recruitment. At the Ministry of Agriculture level, no specific training targeting biodiversity conservation were dispensed, however trainings were provided on Law enforcement, forest fires, fire prevention and fighting, fisheries and specifically fish species identification (provided by the FAO) as well as on the use of GIS and GPS which have indirect secondary benefits on biodiversity. Intensive sets of trainings were concentrated on the period of 2004- 2005 during the Forest Ressources Assessment project executed by MoA and FAO. Aiming to ensure that qualified staff is efficiently carrying the necessary measures related to forest biodiversity conservation, forest guards of the Ministry of Agriculture follow 4 to 5 yearly sessions oriented to forest fires prevention. Within the context of the national forest fire campaign initiated since October 2007, several training workshops were conducted through the different projects executed within this campaign by MoE and a local NGO "AFDC" in coordination with the National Technical and Administrative Committee on forest fires established by the Prime Minister. These trainings were provided to the officials of Civil

			Defense, the Army and the forest guards of the Ministry of Agriculture on forest fires techniques and Incident Command System, the officials of the Internal Security Forces Training on forest fires investigations and the volunteers from the local communities about forest fires techniques. In addition to awareness campaigns to the farmers regarding forest fires the prevention.
	Co-ordinate between involved institutions (Agriculture, Environment, Research and Education).	- Forest biodiversity	Coordination is being done among concerned institutions when needed but not in a systemic manner or through a methodical mechanism. The major overlapping occurs between the jurisdiction of Ministry of Agriculture and the Ministry of Environment on Forests as the MOA has authority over forest management and sustainability whereas the MOE has authority over protected areas, of which 6 out of 8 fall on forested lands. Within the context of the National Campaign on Forest Fires initiated in October 2007 upon the huge forest fires that devastated Lebanon in that period, coordination between involved institutions was ensured through a National Technical and Administrative Committee on forest fires established by a decision from the Prime Minister in order to face this emergency situation. The mentioned National Committee was headed by the Ministry of Environment and included representatives from concerned institutions: Ministry of Agriculture, Ministry of Interior and Municipalities (Directorate General of Civil Defense and Directorate General of Internal Security Forces), Ministry of National Defense, Council of Development and Reconstruction, the Higher Relief Council and an NGO (AFDC). The Committee has set the basis to strengthen the coordination among all concerned institutions and to unify their efforts to enhance forest fires prevention and fighting. In this regards, A National Forest Fires Strategy was developed and endorsed by the Council of Ministers in May 2009. The Strategy identified the needed actions for forest prevention and control (fighting) and rehabilitation of damaged lands and has defined the role of each ministry and institution for their implementation as an attempt to sustain the coordination between concerned institutions beyond the scope of an emergency situation. However, basis for coordination in forest management as a whole is still needed.
	Organize hunting to sustain equilibrium in ecosystem, provide economic incentive and allow for a recreational sport activity.	- Forest biodiversity - Ecosystem approach - Economics, trade and Incentive measures	A new Hunting Law (Law No.580/2004) was issued in Lebanon in 2004 to regulate hunting practices and to integrate sustainable hunting in Lebanon. The law established a “Higher Council of Hunting” (HCH) under the guardianship of the Minister of Environment and including representatives from concerned ministries and institutions. The law stipulated

		-Biodiversity and tourism	that decisions to determine hunting season, times, birds and animal of prey, protected species etc… are to be taken by the Minister of Environment after consultation with the HCH. Currently, the Ministry of Environment is preparing with the HCH the requested decisions as well as the needed implementation decrees for hunting law. Although the law has taken into consideration the sustainability of ecosystems and species, but it didn't specify any regulations related to economic incentives. The Sustainable Hunting Project – regional project for West Asia & North Africa countries – implemented by BirdLife International & funded by EU has produced regional synthesis reports about hunting (practices, management, legislation, cultural & religious relation, alternative models & economic incentives) in addition to regional guidelines for hunting management.
	Reduce grazing pressure and develop pasture conditions to maximize animal products.	- Forest biodiversity	The forest law (1949), Close 109, forbids grazing in cut and burned forest for a period of ten years. the Ministry of Agriculture is currently thriving to widen this legal binding to cover also forests sites impacted by fire events. By its mandate, the Ministry of Agriculture has authority to monitor and regulate grazing on public lands but has also been granted authority to issue ministerial decisions forbidding access on private lands upon written request of the landowners. Nonetheless, no data is available on the carrying capacity of the pasture in Lebanon and accordingly no control on grazing pressure is being applied. Traditionally, local communities used to apply a grazing management system on pasture which respected the inherent carrying capacity of the ecosystems and the Hima system of protected areas in Lebanon is building on this know how to promote sustainable use of natural ressources within municipal lands. Most of the efforts undertaken by NGOS in Lebanon and aiming to reduce grazing pressure build on awareness raison towards local communities and close collaboration with farmers and shepherds especially in sensitive areas. A Sub-Regional Action Program (SRAP) to combat desertification has been implemented by UNEP/ROWA (2003-2006) with the collaboration of ACSAD and ICARDA within the context of the UNCCD, through a fund mobilized by GM from OPEC. Within this SRAP, a pilot project on mountain agriculture has been implemented in Lebanon through MoA and in Yemen. Additional funds are still required to fully achieve the objectives of this pilot project.

	Reduce tourism (e.g. no visits during fire hazard season, Sept-Oct).	- Forest biodiversity -Biodiversity and tourism	A national awareness campaign has been launched in 2007 and 2008 to increase awareness towards forest fire prevention but to date, no concrete measures were taken to reduce tourism nor visits during fire hazards season.
	Choose the optimal criteria (age and diameter) for a sustainable use.	- Forest biodiversity	In 2006, YMCA has initiated in close collaboration with the Ministry of Agriculture, a project funded by the Agence Espagnole de cooperation international and the fundacion biodiversidad concerned by the collection of data on *Pinus brutia* forests in 50 different locations in Lebanon. The purpose of the project was to suggest a growth model for *Pinus brutia* enabling a better determination of optimal criteria of age and diameter for a sustainable exploitation of pine forests.
	Determine the ideal structure of forest tree populations.	- Forest biodiversity	A growth model of *Pinus brutia* has been developed by the YMCA project mentioned above but the model still needs fine tuning before being transferred to site managers and forests guards and municipalities.
	Spatial and temporal organization, in other terms planification, of all actions considering each and every previously identified forest product or service.	- Forest biodiversity	The adoption of spatial and temporal organization and planification is postponed to the time when the previous measures and recommendation are effectively implemented.
	Follow-up and monitor (1) to make sure that the suggested actions are correctly undertaken, (2) to correct any occasional mismanagement, and (3) to be able to supply quick remedy for any natural hazard outburst.	- Forest biodiversity - Identification and Monitoring	Natural hazards are rare to occur in forests in Lebanon at the exception of fire event which can be caused by anthropogenic or natural causes and the specific case of outburst of *Cephalcia tannourinensis* pest in Cedar forests ecosystems in the nature reserve of Tannourine. In this case, the Ministry of Agriculture had coordinated efforts with other concerned authorities such as Ministry of Environment, research institutes and the Army and Civil defense to secure quick and effective intervention against the pest. Furthermore, the MoE executed through the American University of Beirut (AUB) the "Integrated management of cedars forest in Lebanon in collaboration with other Mediterranean countries" financed by GEF/UNEP which has put into place a management plan for the reserve including the determination of the causes of appearance of the pest *Cephalcia tannourinensis* in the Tannourine Cedar Nature Reserve and its different lifecycles, the project resulted in the containment of this pest, the identification of

			the causes of its appearance the project output will help preventing similar outbreaks in other countries that might face such threats in the future. The Ministry of Agriculture can also, upon need provide assistance in terms of technicians, proposal writing, pesticides delivery, tree cutting licenses, monitoring….etc. There is a notable lack of monitoring expertise and skilled manpower, monitoring plans are almost non-existent, standards are not yet ratified and updated-upgraded equipment is lacking at the national level. Within the protected areas and in relation to terrestrial ecosystem, an integrated monitoring manual is in preparation for the Al Shouf Biosphere Reserve. The manual adopts adaptive management to improve actions or to correct any mismanagement. Within the IBA programme, SPNL is promoting the use of the IBA monitoring approach for monitoring the declared IBA sites in Lebanon. All data gathered during the "IBA research & community" project has been entered into the World Bird Data base as a baseline information about the IBA sites whereby monitoring would provide the basis for decision making & science based management of the sites. In terms of effective and timely intervention in case of natural hazards, there is a need for a national strategy that defines the roles and responsibilities of each involved Ministry, local authority or institution.

2.5. Fresh Water Biodiversity Conservation

Relevant CBD thematic programme of work: Inland waters biodiversity
Goal 2 : To conserve fresh water biodiversity, manage and wise use fresh water resources sustainably.

Objectives	Planned Actions	Relevant CBD articles and thematic programmes and cross-cutting issues	Status of implementation
1.To save, use and study biodiversity in fresh water ecosystem	Establish a water quality control system and implement safe water use programmes.		No national initiative aiming at establishing a water quality control system specifically targeting biodiversity conservation is implemented in Lebanon. Instead, there are few studies undertaken by CNRS to evaluate water quality in term of management like the "Role of the macrophytic communities in the functioning of a Lebanese river course (Litani): relation macrophyte - water quality" study and "Impact of anthropisation on the quality of Nahr el Bared waters: usage of index methods and correlation of physico-chemical, bacteriological and biological parameters" study.
	Well-drilling should be be managed to conform to aquifer capacity.		Very strict regulations exist in Lebanon with relation to well drilling; however effective law enforcement is still very weak and in practice the number of artesian wells is constantly increasing with no consideration of aquifer capacity.
	Water sources polluters should be asked to reduce pollution, pay to rehabilitate or encouraged to alleviate pollution pressure.	- Incentive measures	The law of Protection of Environment No.444 issued in 2002 has addressed the polluter pay principle. The principle states that every polluter should bear the costs of the preventive measures and the costs of combating pollution and its reduction. However, the principle is not implemented yet; it needs the elaboration of the necessary implementation decrees for its enforcement. In addition, the law dedicates an entire chapter for the penalties on infractions to the environment. Incentive measures were addressed also by the law 444/02 which includes a specific chapter on incentive measures. The chapter states that every person using equipments and technologies that avoid or reduce or destroy all forms of pollution as well as treat the waste, recycle it and reuse it, benefits from reductions on customs duties due on these equipments and technologies, in the proportion of maximum 50 % (fifty per cent). In addition, every physical or juristic person performing activities that protect the environment shall benefit of reductions on taxes due on these activities, in the proportion of maximum 50 %.

			The law states too that the Council of Ministers, upon the proposal of both the Ministers of environment and finance and the concerned minister, may adopt other economic or financial incentive measures. However, these measures are not applied yet due to the fact that relevant implementation decree was not issued yet.
	Impact assessment of projects dealing with water storage (dams, lakes) is needed prior to project execution.	- Impact assessment and Minimizing Adverse Impacts	The Environmental Impact Assessment (EIA) concept was endorsed through the Law for the Protection of the Environment (no 444/02) which set in article 4 many environmental principles one of which is the EIA principle; the law states that this principle should be used as a planning and management tool for preventing pollution and minimizing degradation of natural resources. Impact Assessment was addressed in particular through articles 21, 22 and 23 of the law: Based on the law 444, draft EIA decree and SEA decrees were prepared by the Ministry of Environment and submitted to the Council of Ministers for endorsement. The draft EIA decree includes details related to various steps of EIA system (screening, scoping, review and monitoring). The draft decree states that all major development, infrastructure and industrial projects will have to undergo an EIA study including effects on biodiversity, in order to promote conservation activities before receiving approval. Despite that the decrees were not endorsed yet, EIA studies are being already requested for main projects prior to their execution based on law 444, and accordingly MoE reviews the studies and provides its approval after verification of their compliance with environmental protection conditions and sustainability of natural resources.
	Exercise very close and strict conditions on introducing new species.	-Alien species	Very limited work was done in Lebanon to identify or control or track the introduction of alien species and no significant measures were taken in this purpose especially regarding fresh water ecosystems. Only few species of major concern to some scientists have been studied in the different ecosystems and even rarely in the inland water, only two examples of studies related to identification and monitoring of alien species in fresh water are known: 1) Assessment of the status and conservation requirements of the minnows (Teleostei: Cyprinidae) endemic to the inland waters of Lebanon (Bariche, M.) and 2) Case of Butomus umbellatus with invasiveness character in the Litani River (Abou Hamdan et al.) The Ministry of Agriculture has provided a list of exotic species to be banned at importation to the Lebanese customs as well as quarantines staff. However, the staff lacks proper skills to identify the species and apply the ongoing regulations. Moreover, the CITES convention regulates the trade

			of wild species and restricts throughout its annexes the exchange of certain species. Even if Lebanon has not yet signed nor ratified the CITES, the MoA, refers to those annexes when it comes to regulating import and export of species and issued accordingly a permit known as "CITES" permit.
	Wetland conservation areas should be established and aquaria set-ups must be implemented		Four Ramsar sites are declared in Lebanon: three coastal and marine areas (Palm Islands nature reserve, Tyre Coast nature reserve and Ras el Chakaa) and one wetland (Aammiq marsh) which is a private property not declared yet as nature reserve however is protected and managed through private initiative in coordination with MoE. Management plans were established by the Ministry of Environment for Aammiq wetland and the nature reserves of Palm Islands and Tyre Coast.
	Implement public awareness programmes in water use, quality, saving	- Public Education and Awareness	Local initiatives aiming at raising awareness on water saving were promoted and undertaken over the past 3 years (for ex: Bekaa Water establishment and South Lebanon water establishment). Those campaigns built on displaying waster saving messages on billboard, addressing reduction of water consumption and future generation attitude towards water use. The South Lebanon campaign was supported by USAID and targeted around 1200 subscribers and 37 schools and environmental clubs. It produced awareness material (brochures, stickers, leaflets, and ativity books for kids) as well as it provided school teachers on water conservation and the use of the material. The project also organized a water fair for the occasion of the world water day on March 22, 2006.
	Forest control programmes should expand to cover river basin habitats.	-Identification and Monitoring	Although the ecological link is obvious between achieving river basin protection and forest control, in Lebanon the major constraints lies in the fragmentation of responsibilities in the various disciplines interested in this topic. Most projects targeting river basins in Lebanon focus on water quality and water availability. Lately, in 2009, the MOA has launched a call for participation for the reforestation of the slopes surrounding the newly build dam of Chabrouh as a contribution to reduce erosion and sediments leaching and furthermore protection of the dam.
	Establish a data base system for fresh water richness and endangered species.	-Identification and Monitoring	The only national inventory on fresh water ecosystem richness for Lebanon was published by MOA/ UNEP/GEF in 1996 as a collaborative effort of several experts.
	Expand fresh water fish farms to reduce pressure on natural habitats.		Freshwater aquaculture has been practiced since the 1930s (El-Zein, 1997). More than 90 percent of aquaculture production in Lebanon is rainbow trout, Onchorhyncus mykiss. They are grown in semi-intensive growing systems which were introduced in 1958. There are currently about 150 fish farms or holdings. Tilapia farming was recently tried out through several private initiatives.

			Aquaculture is mainly practiced in the following regions of the country: Bekaa, Akkar district of Northern Lebanon and South Lebanon. In 1960 the Ministry of Agriculture (MOA) established the Anjar Center for Aquaculture in the Bekaa area to develop the sector. The Center started as a hatchery service producing rainbow trout fingerlings and distributing them free of charge to growers to encourage intensive and semi intensive growing of the species.
	Strengthen plant aquaculture to produce protein and organic matter efficiently.	- Ex-Situ Conservation	Fresh water fish are not very much appreciated on the Lebanese market. Lebanon imports yearly 3000 – 12000 tons of fish (chilled or fresh) very few of which are originating from fresh water. The production system used is mostly semi-intensive. The average annual production of trout is around 600 tones (MOA figures). This is produced by 150 farms, 80 percent of which are in Hermel-North Bekaa, at a total value of US$ 2 million and an estimated average yield of 10-12 tones (at approximately 1.5 Kg/liter/minute). Total fish production (capture and aquaculture) accounts for less than 27 percent of local consumption. Aquaculture contributes about 10 percent of local production and 3 percent of local fish consumption. Aquaculture production and productivity in Lebanon can be boosted in relation to water availability and quality and the favourable growing conditions. Apart from Morocco, Lebanon is the only Arab country growing trout. Farming practices and technologies used need to be enhanced. Investments are needed to develop the sector along with the support infrastructure. Research is needed to improve feed conversion, health management and growing techniques for different species.
	Mountain lakes have to be extended all over appropriate areas including protected areas.	-Protected Areas	Small mountain lakes for agricultural and aquacultural purposes are established in many areas of the country. They are of surface areas varying between 500 and 1500 m^2. Within the Al Shouf Cedar Biosphere Reserve, an artificial lake finance by Japan was created but in order to put out any possible fire.
	Research, building of capacities and studies on fresh water biodiversity should be expanded and supported	-Research and Training	The CNRS allocate yearly a budget of 600 000 USD, to support PhD research grants and approximately 175 000 USD for the research grant programs; out of which 2 or 3 per year are oriented to biodiversity topic and 1 to 2 to subjects related to fresh water biodiversity. The Marine Research Center is participating in a project on the role of the macrophytic communities in the functioning of a Lebanese river course (Litani): relation macrophyte - water quality.

			Research institutions for aquaculture are private and public. They are as follows: • Aquaculture research projects involve trout growing and technology transfer at the Anjar Center for Aquaculture Hatchery. • American University of Beirut research which currently focuses on rabbitfish, Siganus spp. and white seabream, Diplodus sargus. Other projects include work on grouper, Epinephelus spp. and the health benefits of fish consumption as well as dual water usage technology in semi-arid regions. • The Lebanese University, the national university, conducts research in collaboration with NCRM and the Anjar center. There is little cooperation among institutions, but this is being remedied by the researchers themselves who are now attempting to develop a joint aquaculture initiative for Lebanon. Although the Anjar Center is trying to transmit new findings and technologies to growers, a lot still remains to be done on the dissemination of information, training and technology transfer.

2.6. Marine Biodiversity Conservation

Relevant CBD thematic programme of work: Marine and Coastal biodiversity

Goal 3: To protect Lebanon's coastal and marine Biodiversity and develop their resources in a sustainable way.

Objectives	Planned activities	Relevant CBD articles and thematic programmes and cross-cutting issues	Status of implementation
1. To protect coastal and marine ecosystems and Biodiversity.	Identify hot spots and land based sources of pollution in addition to man-caused maritime sources pollution such as petroleum.		The Marine National Research Center undertakes monthly surveys to assess the quality of water with regards to land based sources of pollution. The information is published yearly in the Lebanese Science Journal and the Marine Center/ CNRS has published a 25 years report of the collected information on the hot spots for pollution. In addition, among the recent studies undertaken by CNRS is a scientific methodology and suggestion of a law project for chemical pollution protection of the Lebanese coast. After the oil spill catastrophe that occurred on the Lebanese shorelines resulting from the war in Lebanon in July 2006, the Lebanese Ministry of Environment took emergency actions with the financial and technical support of several international, regional and national partners. The damage caused to coastal and marine resources was assessed and emergency cleanup operations were done in two phases followed by waste management. In the first phase, floating or mobile oil was removed to avoid its movement to new sites; in the second a higher level of cleanliness was required as it involved the removal of remaining fuel oil off rocks and structures using High Pressure pumps. The oil spill and both cleanup phases generated oil waste that was removed and stored in safe storage. The Ministry of Environment identified the most feasible and environmentally sound Oil Spill Waste Management solutions for Lebanon and a Waste management concept has been finalized and shared with stakeholders and potential partners through dissemination but the treatment of waste was initiated in one site awaiting additional financial resources for completion in other sites. Projects of site restoration and rehabilitation were proposed by the Ministry of Environment in order to assist the natural processes of the habitat in rebuilding a healthy, functioning natural

			ecosystem that works as it did before it was polluted or destroyed, so far the rehabilitation was only initiated in Palm Islands Nature Reserve awaiting additional financial resources for execution in other sites. Working with partners and stakeholders already proved to be successful during the cleanup phases, the storage of contaminated debris and the already started waste management. The major development partners of the phase I include: -The Swiss Agency for Development and Cooperation (SDC-Switzerland) - The Italian Ministry of Environment (Italy) -The Canadian International Development Agency (CIDA - Canada) - The Oil Petroleum Exporting Companies - Opec Fund for International Development (OPEC-OFID) - The United States Agency for International Development - French Navy - Private companies. - The Lebanese Navy -National NGOs: Byblos Ecologia, Greenpeace, Bahr Lubnan, Cedars for Care NGO, Safer NGO, UNADP, The major development partners of the phase two include: - The Japanese Government - The Norwegian Government - The United States Agency for International Development - The Government of Spain. More specifically, in Palm Islands Nature Reserve (PINR), a project was implemented in 2006-2007 aiming at assessing the effect of the oil spill resulted from 2006 war on the biophysical environment of the islands through conducting terrestrial and marine surveys with ecotoxicological laboratory analysis. The project was co-managed by the Lebanese Ministry of Environment (MoE) and the IUCN Centre for Mediterranean Cooperation and technically supported by the American University in Beirut and the IUCN Mediterranean Marine Program. The project resulted in the Development of a short, medium, and long term monitoring plan of indicator/ key species and physical parameters of PINR based on the information collected in the biodiversity survey and pollution assessment.

			Furthermore, following the pollution by the black tide that hit the Lebanese coasts during the hostilities in July 2006, the CNRS has developed a National Action Plan: "Follow up of impact contamination by the hydrocarbons on the Lebanese sea environment". This program aims to evaluate the impact of this pollution on the whole marine ecosystem. A strategy following three phases was elaborated: Short term – 2006, Middle term – 2007, Long term -2011.
	Limit further industrial development along the coast.		Aiming to reduce the impact of coastal and sea based activities on water quality, Lebanon has suggested a national strategy that integrates the need to limit further industrial development along the coast (northern) as part of the Integrated Management of Eastern Mediterranean Coastlines (IMAC) that was executed by the Balamand University and the SDATL.
	Introduce incentives for a clean industry and legislate for "polluter pays principle.	-Incentive measures	Incentive measures were addressed by the law of protection of Environment (law 444/02) in a specific chapter; however this is not applied yet due to the fact that relevant implementation decrees were not issued yet. Perverse incentives were addressed also for the protection of the environment in general (covering biodiversity) by the above mentioned law which calls for the principle of polluter payer. The principle states that every polluter should bear the costs of the preventive measures and the costs of combating pollution and its reduction. However, the principle is not implemented yet; it needs the elaboration of the necessary implementation decrees for the enforcement.
	Conduct environmental impact assessment surveys prior construction of treatment plants.	-Article 14: Impact assessment and Minimizing Adverse Impacts	The Law for the Protection of the Environment (no 444/02) has called for the EIA principle as a planning and management tool for preventing pollution and minimizing degradation of natural resources. Impact Assessment was addressed in particular through articles 21, 22 and 23 of the law: The law stipulates that concerned institutions, both in public and private sectors should carry out Initial Environment Evaluation (IEE) or EIA studies to projects likely to threaten the environment due to their extent, nature, impact or activities which cover all projects dealing with construction or other infrastructure, all activities affecting the natural environment through extraction or dumping of natural resources, or any proposed program, study, investment, or management that might affect a whole Lebanese area or a certain sector. The projects that need EIA also include any change, addition, expansion, rehabilitation or closure of any activities mentioned above. The MoE undertakes the review of studies and consequently provides its approval after verification of their compliance with

			environmental safety conditions and sustainability of natural resources. Based on the law 444, a draft EIA decree was prepared by the Ministry of Environment and submitted to the Council of Ministers for endorsement. The draft EIA decree includes details related to various steps of EIA system (screening, scoping, review and monitoring). The draft decree states that all major development, infrastructure and industrial projects will have to undergo an EIA study including effects on biodiversity, in order to promote conservation activities before receiving approval. Despite that the EIA decree was not endorsed yet, EIA studies are being requested based on law 444 for major projects including waste water treatment plants prior to their execution and are submitted to MoE for review and approval accordingly. So far, 34 EIA studies for treatment plants were submitted to the Ministry since 2001.
	Develop National Action Plan within the Framework of Mediterranean Action Plan.		The Lebanese Ministry of Environment has prepared in 2002 a national report on the coastal and marine biodiversity and elaborated accordingly five national action plans, within a regional project known as SAP-BIO project executed by the Regional Activity Center for Specially Protected Areas (RAC-SPA) within the framework of the Mediterranean Action Plan (UNEP-MAP). The five national action plans (NAPs) of Lebanon were elaborated according to national priorities as follows: a NAP to “develop of a permanent monitoring strategies for marine and coastal biodiversity”, a NAP on the “Updating of Lebanese legislation and development of guidelines for coastal and marine conservation”, a NAP to “Determine the physical parameters of the Lebanese marine environment”, a NAP on “Awareness campaigns for the Lebanese coastal communities and the public sector” and a NAP on “Establishment of a conservation strategy for coastal habitats”. Based on the National Action Plans submitted by each Mediterranean country, the RAC-SPA has developed a Strategic Action Plan for the conservation of marine and coastal biodiversity in the Mediterranean. A regional project for marine biodiversity in the Mediterranean was elaborated based on the mentioned Strategic Action Plan and was integrated along with another component related to the sea pollution from land-based sources into an umbrella project for the Meditarranean sea the “Large Marine Ecosystems” which was submitted to the GEF for funding. The latter project in its two

			components (biodiversity and pollution) has got the GEF approval and is in process to be initiated. The biodiversity component of the regional LME project cover two main issues: a- Conservation of marine and coastal biodiversity through the development of a Mediterranean marine protected areas (MPA) network. b- Promote sustainable use of fisheries resources in the Mediterranean through the development and application of ecosystem-based management approaches. Among the recent studies undertaken by CNRS is the influence of river provisions on the marine productivity before the dam installation: case of Nahr El Kalb.
	Conduct a comprehensive survey of the situation of the coastal zone and review land use maps and legislation. Legislate for the necessity of co-ordination within the public sector in particular.	- Identification and Monitoring	The CNRS has developed with the International Center for Advanced Mediterranean Agronomic Studies (CIHEAM) particularly the Mediterranean Agronomic Institute of Bari (Italy), a project proposal on Environmental monitoring and sustainable development of the Lebanese Sea. The main objective is to support marine and environmental research over 3 years. CIHEAM- Bari, in collaboration with specialized marine researchers in Lebanon and Italy, participated in the rehabilitation of a fishing boat and its transformation into a scientific vessel specialized on marine research. In April 2009, an agreement was signed between the CNRS and the Italian Government which secures a 2.3 million euro financial support to research. The Scientific vessel, CANA- CNRS, will be used for a number of scientific campaigns such as monitoring: Coastal Bathymetry; physiochemical and microbiological sea parameters; primary and secondary ecological production; benthos community analysis, marine ressources, Marine mammalian protection and oil pollution. The project on Integrated Management of East Mediterranean coastlines (IMAC), has prepared the background for lacking national legislative and institutional framework for Integrated Coastal Zone management in Lebanon. Therefore the project has developed a structural sustainable mechanism for coastal zone management in cooperation with local stakeholders. In the long-term, the goal for coastal zone management should still be to establish a national framework for integrated management of the Lebanese coast, including clear legal provisions and institutional responsibilities, as well as to strategically integrate CZM with spatial planning.

			A diagnostic land use plan for the coast of North Lebanon has been prepared by the IMAC Project
	Enhance law enforcement authorities and put into place a co-ordination mechanism. Introduce the concept of the environmental police.		The law 690 dated 26/8/2005 related to the mandate and the organization and of the ministry of environment has defined a new service at the Ministry "the service of regional departments and environmental police", this service will be responsible for the supervision of the work of the regional departments and environmental police of the Ministry of Environment, and ensures the coordination and the collaboration between them and the different departments at the MoE headquarter. This new service will be functional once the new organizational decree of MoE is issued.
	Establish contingency plans to combat pollution or mitigate their harmful effects.	-Impact assessment and Minimizing Adverse Impacts	The law for the protection of Environment (law 444/02) states in article 50 that an emergency action plan should be elaborated for each region in Lebanon as response to any activities that might have negative impact on the environment in general; however the plan has not been developed yet. Nevertheless, measures in this regard are being addressed through the SEA plans and programmes and trough EIA studies for projects. The oil spill Catastrophe that hits the Lebanese coasts during the 2006 conflict has lead to the development of the International Assistance Action Plan which stresses on the importance of developing a national contingency plan for oil disasters. After this catastrophe, the damage caused to coastal and marine resources was assessed and emergency clean up operations were conducted along the affected coastal and marine areas through three phases: In the first, floating or mobile oil was removed to avoid its movement to new sites; in the second the removal of remaining fuel oil off rocks and structures using High Pressure pumps was done; in the third phase, the oil waste generated from the oil spill and from both cleanup phases was removed and stored in safe storage. The Ministry of Environment is continuing to look into the most feasible and environmentally sound Oil Spill Waste Management solutions for Lebanon and a Waste management draft concept note paper has been prepared and will be shared with stakeholders and potential partners once finalized, so far the treatment of waste was initiated in one site awaiting additional financial resources for completion in other sites. Projects of site restoration and rehabilitation were proposed by the Ministry of Environment in order to assist the natural processes of the habitat in rebuilding a healthy, functioning natural ecosystem that

			works as it did before it was polluted but this was not initiated yet except in Palm Islands Nature Reserve awaiting necessary financial resources for execution in other sites. These emergency operations were conducted by the Ministry of Environment with support by many partners and stakeholders including several Government States, regional and international organizations, international and regional financial institutions, international, regional and national non-governmental organizations and the private sector as well as national administrations and institutions (please refer to the list above). More specifically in Palm Islands Nature Reserve, the Ministry of Environment and IUCN carried out in August 2006 a rapid assessment of the reserve to quantify the impact of the oil spill resulting from the 2006 war, on the environment and management of the nature reserves. Furthermore, cleaning up operations were executed in the Islands and were conducted through the services of the local fishermen community which brought economic benefit to more than 100 families of fishermen. Moreover, the Ministry of Environment signed in 2007 a MoU with the Spanish Agency for International Cooperation (AECI) which is now under implementation for the removal of oil contamination that remains in Palm Islands Nature Reserve as well as implementing a monitoring program for the marine part of the reserve, in addition an "Emergency clean up operation on Palm Islands Nature Reserve" was also executed through a project supported by Swiss Government represented by The Swiss Development and Cooperation Agency (2006).
	Organise a network of observation stations centered around the National Centre Marine Sciences or the NCSR, and assist in the rehabilitation of research centers in general	- Technical and Scientific Cooperation	The national Council for scientific Research (CNRS) established since 1980 a National network for observing the Lebanese coastal waters in 30 sites along the Lebanese coastline whereby physical, chemical, bacteriological and biological analyses are carried out monthly in wither and 2 times per month during the summer. Furthermore, the CNRS is building partnership for the creation of a network for the observation of Cetacean of the Mediterranean sea and has conducted in January 2008, a workshop on developing a national action plan for cetacean conservation. The Marine Resources and Coastal Zone Management Program (MRCZM) at the institute of the Environment-UoB has been monitoring commercial fisheries in North Lebanon at the level of species.

	Develop partnership and co-ordinate action with all concerned parties such as the government, the industry, and NGK's, and conduct public awareness campaigns targeting society at large.	- Article 5: Cooperation	The management of the marine nature reserve, Palm Islands and the coastal nature reserve, Tyre Coast and the related projects and activities within these sites are implemented in partnership with local communities, civil society, local and central authorities thus promoting partnership and coordination with all concerned to ensure sound management of the reserves and the conservation of its biodiversity. A Local NGO which is represented in Palm Islands Nature Reserve Committee received a financial support from Dutch Ministry of Foreign Affairs in 2007 for a project aiming at building common consenus among local communities and stakeholders on the sustainable use of Palm Islands. More recently, a monitoring programme of marine turtles was developed for the Palm Islands nature Reserve and will be implemented in partnership with an industrial institution located in the same area the "Cimenterie Nationale". As for the conducted awareness campaigns in the reserves and its environement, awareness activities were performed by management teams of Palm Islands and Tyre Coast Nature Reserves targeting local communities, fishermen, schools and visitors and using different awareness materiel like brochures, posters, birdwatching events, press releases, etc… to sensitize a wide range of people. In Tyre Coast Nature Reserve, partnership was created with a local NGO as well as with some local volunteers to conduct awareness campaigns and training on Marine turtle monitoring. At the beginning of 2007, SPNL NGO entered in partnership with major national and international organizations including SDC, IUCN, Euronatur, BirdLife International and Qoleileh Municipality to develop an innovative initiative for assisting the economically distressed fishermen and for serving the environment at the same time. Accordingly, SPNL raised funds to initiate a marine "Hima" in Qoleileh village located after Tyre city in South Lebanon, at an aim of conserving the southern Lebanon beach and its maritime marine resource, stimulating socio-economic development and benefiting 15 families of fishermen by creating jobs for them and investing in the tourism potentials of the area and encouraging ecotourism. Accordingly, Qoleileh coast was declared as a Marine "Hima" which is a traditional community based protected area system and the awareness efforts concentrate on the biodiversity value of the site, legal fishing and diving.

	Integrate action with International activities and pool expertise.		There is a continuous demand for technical and financial assistance from international concerned agencies to implement projects and activities related to biodiversity; proposals are being continually prepared integrating the national needed actions and priorities with international programmes to mobilize necessary funds from related donors in the biodiversity field in general and its components. The best examples of integrating actions with international activities are offered by the marine research center of CNRS and the Balamand University who is conducting an integrated management of east Mediterranean coastlines (IMAC). The project aimed at: 1) improving the living conditions of local communities along the coast of North Lebanon; 2) maintaining and enhancing a clean and healthy coastal environment for the benefit of present and future generations and 3) ensuring the economic development of different sectors and communities along the coast through sustainable use of natural resources.
	Establish natural reserves and marine park representing major eco-geographical areas.	-In-Situ Conservation	The existing network of Protected areas in Lebanon includes a marine nature reserve (Palm Island) and a coastal Nature Reserve (Tyre Coast). The existing adopted system does not consider marine parks as one of the potential categories for protection. Under the “Coastal Areas Management Programme” CAMP project which includes within its activities, a thematic activity related to the “Marine Conservation areas”, Lebanon elaborated the technical and administrative profile for the declaration of two marine sites located in South of Lebanon (Naqoura beach and Damour River Basin) as specially protected areas at national and Mediterranean levels. Ministerial decisions aiming to achieve protection of those two sites were prepared but are not yet forwarded for endorsement. A “Memorandun of Understanding” between MoE and IUCN was signed in 2009 in order to implement a two years project supporting the management of important marine habitats and species in Lebanon, the project aims at the development of a network of marine protected areas and an associated monitoring programme. On the other hand, a national NGO SPNL has initiated a marine “Hima” in Qoleileh & Mansouri coastal areas in South Lebanon through municipal decrees and in collaboration with the local communities. The “Hima” is a traditional system of protected areas which is based on the role of the local communities in the protection, management and sustainable use of natural resources.

	Develop an environmental monitoring programme for pollutants and other bio-indicators.	Identification and Monitoring	The National Council for Scientific Research (CNRS) implement since 1980 regular monitoring program for pollutants from marine and coastal based sources through monthly surveys. In addition, after the oil spill that hit Lebanon shorelines during the July 2006 hostilities, the CNRS has developed a National Action Plan to monitor the effect of the fuel pollution along the Lebanese coast and implemented accordingly in 2006-2007 a monitoring program of the contamination impact by the hydrocarbons on the Lebanese sea environment through monthly surveys. Afterwards, within the same National Action Plan, the CNRS focused its monitoring on the sediments caused by the oil spill in seven sites where marine organisms are collected (e.g. bivalves) on the basis of two times per year. More recently, the CNRS received a gifted boat from the Italian Government with 2.5 M $ to continue the multi-monitoring allover the waters of Lebanon. In addition the CNRS marine center is participating to several research projects aiming at completing the coastal monitoring approach such as: - A project enrichment of marine water by river sediments provisions in Nahr el Kalb - A project on the wind effect on the dispersion of water rejections in Ghadir - A project aiming to suggest a draft law for chemical pollution protection on the Lebanese coast - A project on mercury level in precipitations (rain and snow) - A project on the impact of chemical rejections on meiofauna in Batroun / Selaata. - A project was implemented in Palm Islands Nature Reserve (PINR) in 2006-2007 aiming at assessing the effect of the oil spill catastrophe resulted from 2006 war on the biophysical environment of the islands through conducting terrestrial and marine surveys with ecotoxicological laboratory analysis. The project was co-managed by the Lebanese Ministry of Environment (MoE) and the IUCN Centre for Mediterranean Cooperation and technically supported by the American University in Beirut and the IUCN Mediterranean Marine Program. The project resulted in the Development of a short, medium, and long term monitoring plan of indicator/ key species and physical parameters of PINR based on the information collected in the biodiversity survey and pollution assessment. In relation also to the oil spill catastrophe, at present the Ministry of Environment is planning to initiate a detailed oil spill environmental monitoring plan for one year

			which monitors marine ecosystem health (water, biodiversity, etc.), and assess physical damage, as well as chemical damage & identifies site rehabilitation/restoration where needed.
2. To use marine and coastal resources in a sustainable manner by creating partnerships with the stakeholders, in particular, the local communities.	Enhance the economic impact of monitoring programmes such as coastal quality monitoring for bacterial indicators in order to enhance the market value of the local beaches and produce.	-Identification and Monitoring - Sustainable use of biological diversity - Economics, trade and Incentive measures -Biological Diversity and Tourism	Following an agreement between Lebanon and Spain, the Agency AECI (Agencia Espanola de Cooperacion Internacional) and Tragsa public company in Spain implemented in 2008 a serious bio-monitoring programme in the marine environment of Palm Islands Nature Reserve. The IMAC Project has been monitoring E. coli in marine waters in four localities in North Lebanon. The Marine Centre of CNRS has been continuously monitoring the physical, chemical marine environment. In addition, monitoring of bacteria and other lower organisms is done on a monthly basis for the past 25 years.
	Study the fishing sector scientifically (practices, needs, potential, and stocks).		The marine fish diversity has been investigated in North Lebanon by the Marine Resources and Coastal Zone Management Program (MRCZM) at the institute of the Environment-UoB and is now being investigated in South of Lebanon to identify fish stocks, and implement new fishing methods.
	Develop new legislation or modernise existing ones as regards fishing periods, fishing technology, gear, etc. to protect turtles and marine mammals.		The Ministry of agriculture has issued many decisions banning the fishing by using dynamites and trawling nets. In addition to decision banning the fishing of marine turtles, cetaceans and monk seals issued in 1999 as well as selling, use or trade of any derivates from the mentioned species. However the main obstacle remains the proper enforcement of legislation. The Law for fisheries in Lebanon dates back to 1928. The Ministry of agriculture have coordinated efforts with the FAO since 2004 to draft a new law on basis of extensive field data collection. However, the draft law is still being discussed with fishermen and no consensus is reached yet.
	Identify all types traditional industries that were marine oriented such as salt production and sponge fishing.	- Traditional Knowledge and related provisions - Economics, Trade and Incentive measures	Salt industries in North Lebanon were very flourishing in the late 70s but since then, a lot of small traditional slat production went out of business and only one salt industry remains active to date. Regarding sponge fishing, the Statutory Order No 95 dated 9/5/1939 regulates Sponge Fishing in Lebanon, and No 63 dated 16/3/1993 prohibited sponge fishing for five years and afterwards the Statutory Order No 281 dated 19/11/1998 was issued and it prohibited sponge fishing for another five years.

			Moreover, in North Lebanon, one small industry for smoking salmon fish is active. The IMAC project worked to preserve and promote traditional industries such as the salt extraction industry by promoting local salt products, rehabilitating the existing wind mills and establishing a Salt museum, i.e. in Deir el Natour in North Lebanon; and to protect the traditional boat manufacturing industry and copper making in addition to traditional soap manufacturing. The Marine center/ CNRS always tries to involve fishermen in researches ongoing on marine biodiversity or fisheries to place detectors, locate interesting spots etc… but no systematic partnership is clearly established with fishermen. The Italian NGO 'Ricerca e Cooperazione' promoted the ***project***:'Socio-economic development of the fishing community of ***Tyre and Batroun in 2008.*** A project on "Common consensus among local communities to manage Palm Islands financed by the Netherlands Embassy successfully attempted to create a partnership with locals and fishermen. More recently a CDR/EFL/GTZ project is assessing the needs of locals as well as of fishermen and planning to capitalize on their traditional knowledge while building their capacities.

	Create partnerships with the local population, particularly the fishermen and local municipalities. NGK's could play a catalytic role in this.	-Traditional Knowledge and related provisions	The IMAC project mentioned above has involved fishermen and farmers in recreational and eco-tourism activities to generate alternative jobs and income opportunities. E.g. by offering recreational fishing tours or organizing on-farm-visits to experience Lebanese rural life. Following the oil spill that resulted from July 2006 war and that hit the Lebanese seashores causing damages to the different fishing equipments and engines of the fishermen, UNDP had allocated 1.1 million USD to help the Fishermen's Associations in Lebanon by repairing their damaged boats as well as providing them with fishing nets and engines, and rebuilding the fish market in selected areas. The NGO "SPNL" consolidated a site support group (SSG) of 15 fishermen and scouts to support in the conservation of Qoleileh Marine "Hima" located in South Lebanon and which is a community based protected area, after prolonged meetings with the municipality and the community of the village. Frequent meetings have been carried out with the SSG members based on repeated visits to gather the information needed for a successful project implementation. SPNL employed these fishermen in the rehabilitation of the site, and mobilized a grant from Care International to supply the fishermen with two fishing boats equipped with 16 fishing nets. The purpose behind the "Hima" is to allocate fishing rights with the purpose of re-establishing stability in the industry and realistically addressing the issue of job creation as eco-guides linked with environment conservation.
	Develop training programmes and awareness campaigns, particularly as regards the importance of conservation of biodiversity.	-Research and Training Article 13: Public Education and Awareness	The National Center for Marine Sciences/ CNRS is building partnership for the creation of a network for the observation of Cetacean of the Mediterranean sea and has conducted in January 2008, a workshop on developing a national action plan for cetacean conservation. The IMAC project worked to generate jobs consistent with traditional livelihood through encouraging ecotourism activities in coastal areas and provided training to students on agro and eco-tourism to become seasonal eco-touristic guides. A three day training for stakeholders of the Northern coast of Lebanon was carried out in December 2008 on CZM that included one day of field research activities. In addition, an awareness campaign was implemented in March 2009 to promote CZM in Northern Lebanon.

			Under the MedWetCoast project, training of women in the project sites has been done on organic/agro-food to be sold in the community-owned shop, eco-guide training program was conducted to train people from the local community to become guides in the protected areas and training to all protected areas management teams and committees and concerned ministries about management planning. In addition, the project has developed a training program to improve the management of Tyre Coast nature reserve which is one the project's sites. Furthermore, practical monitoring of biodiversity manual was developed for Tyre Coast Nature Reserve to be used by the management team to monitor the ecological status of the site including monitoring of marine turtles. The following materials intended for public awareness & education have been developed for nature reserves including marine and coastal nature reserves (Palm islands and Tyre Coast) by the MoE through the MedWetCoast Project which is an initiative under the RAMSAR Conventions: o An eco-guide training module on five fronts: *Certified eco-guide / Tour operators both eco-tourism and traditional / Natural sites / Visitors / Local community.* o Management kits o Wetland brochure including Tyre Coast Nature Reserve and PalmIslands Nature Reserve o Website on Ramsar Sites in Lebanon, three of them marine and coastal sites: the nature reseves of Tyre Coast and Palm Islands in addition to "RAs el Chaqaa" marine area. o Supply of news to the regional newsletter and website o 15 min documentary on two nature reserves o in Lebanon one of them the "Tyre Coast Narture Reserve" o A bird visitor field leaflet o A poster on the values and benefits of wetlands o Screen saver on protected areas in Lebanon and a poster for the National Day for Protected Areas o Educational and environmental songs tape for Tyre Coast Nature Reserves. o Educational posters to be used during school awareness campaigns. o Four posters about the four Ramsar Sites in Lebanon o Visitor field leaflets on the site's fauna & flora o Site brochures

	Compile an updated national database of local biotopes, flora and fauna. Specify species that are under-utilized or with potential for economic impact. Highlight the unique nature of terraces and the coastal historical settlement sites since prehistory (e.g. sites used f the manufacture stone tools in Rauche)	Identification and Monitoring	The national Council for scientific Research (CNRS) established 1980 a National network for observing the Lebanese coastal waters in 30 sites along the Lebanese coastline. Physical, chemical, bacteriological and biological analyses are carried out monthly in winter and two times per month during the summer. Of the observed biodiversity, algae, planktons and Tintinnids seemed to be of the most steadily studied. Biodiversity Assessment and Monitoring in Palm Island Nature was carried out in the marine part of Palm Islands Nature Reverve: Following an agreement in 2007 between the Lebanese Ministry of Environment and the Spanish Agency for International Cooperation (AECI) and Tragsa (public company in Spain), baseline biodiversity evaluation was carried out in 2008 in the marine environment of Palm Islands Nature Reserve and its monitoring program is in progress currently (in 2009). A practical monitoring of biodiversity manual was developed for Tyre Coast Nature Reserve to be used by the management team to monitor the ecological status of the site including monitoring of marine turtles.
	Study the potential of marine fresh water sources.	Research and Training	The University of Saint Joseph undertook in 2007 a study on physico chemical, bacteriological and biological parameters in the karsts of Chekka which aimed at assessing the impact on marine ecosystems of future eventual karstic water exploitation. A scientific paper was published in 2004 (Shaban, Khawlie, Abdallah & Faour) synthesizing the results of a survey which aimed to locate submarine water discharges using Thermal infrared survey and Satellite images interpretation. 27 major sources were indentified, 10 of which off shore and 17 littoral springs that have a considerable discharge estimated at approx 700 M m3/year.
	Enhance the concept of integrated village developing traditional industries and other related activities associated with coastal area such as olive oil and carob production.	- Traditional knowledge and related provisions - Sustainable Use - Economics, Trade and Incentive measures	The IMAC project worked to generate jobs consistent with traditional livelihood through encouraging ecotourism activities in coastal areas for example: -Involve fishermen and farmers in recreational and eco-tourism activities to generate alternative jobs and income opportunities. E.g. by offering recreational fishing tours or organizing on-farm-visits to experience Lebanese rural life. -Provide training to students on agro- and eco-tourism to become seasonal eco-touristic guides. -Encourage the elaboration of traditional arts and crafts which can be offered to the tourism sector and marketed in Sunday markets or on the Internet: e.g. jewellery, manufacturing of traditional soaps, glass and potter

			-Develop programmes that encourage the young population to work in agricultural activities in order to reduce the rapid migration into cities due to the availability of more job opportunities offered in urban areas, especially in the tourism sector.
	Develop new sectors such as mariculture in order to improve employment conditions of marine operators including fishermen (co-operatives). Local environmental conditions are more favourable than the western Mediterranean basin	- Article 10: Sustainable Use - Economics, Trade and Incentive measures	The establishment of marine aquaculture farms needs the approval of the Ministry of Environment which requires an Environment Impact Assessment study. The start-up of such enterprises is also subject to local authority control whereby such farms are treated as classified enterprises subject to local authority licensing. At present, there are no regulations in direct relation with aquaculture but the MoA is currently reviewing its existing decisions namely Decision 320/1926 on activities affecting water bodies and Decision 8/2001 on liquid waste discharged into the sea in order to include aquaculture activities and resulted discharges. Despite all and the fact that there are around 1 685 species in the marine ecosystem, there is only one saltwater aquaculture facility in Lebanon: a penaeid shrimp (*Penaeus vannamei*) farm in the northern town of Abdeh. On the shrimp farm the fish are stocked into half-acre earthen ponds filled with paddle wheel-aerator seawater and equipped with paddlewheel aerators. Water is exchanged as required. In 2003 the farm imported a new species from Florida, but survival was less than 20 percent. In 2004 it imported from Malaysia. The farm manager reported that 20 g shrimp are sold live for US$ 12/kg. Research institutions for mariculture are as follows: • Public research institution - the National Center for Marine Research (NCMR) under the National Council for Scientific Research (NCRS) is responsible for marine aquaculture research. • American University of Beirut research which currently focuses on rabbitfish, *Siganus* spp. and white seabream, *Diplodus sargus*. Other projects include work on grouper, *Epinephelus* spp. and the health benefits of fish consumption as well as dual water usage technology in semi-arid regions. • Balamand University is planning to construct a research facility to conduct research studies into marine aquaculture. • The government's Oceanographic and Fisheries Institute of Batroun in North Lebanon.

	Highlight the cultural, traditional and artistic significance of the sea by encouraging non-destructive traditional sports		In order to highlight the cultural, traditional and artistic significance of the sea by encouraging non-destructive traditional sports, the Integrated Management of Eastern Mediterranean Coastlines (IMAC) project recommended to: 1) Preserve cultural identity by protecting heritage sites and places ; 2) Preserve archaeological artifacts and places that show the country's history and diversity; 3) Protect and promote archaeological places that date from different historical times (e.g bathhouses, ruins, medieval castles, Tripoli Citadel…); 4) Protect and promote religious buildings and sites as proof of cultural and religious diversity and 5) Organize archaeological excavations in collaboration with international universities.
	Put into place a co-ordinating mechanism of stakeholders.		No systemic coordination mechanism between stakeholders was set in biodiversity field and its components except for the management of nature reserves including marine and coastal nature reserves where a committee are established by decisions from the Ministry of Environment including representing from all concerned parties including government institutions, local authorities, local NGOs, and individual experts to ensure sound management and supervision of the nature reserves. On the other hand, SPNL NGO through the revival of the "Hima" concept in natural resource conservation which is a community-based system of protected areas, initiates a Site Support Group-SSG from the local community in addition to a local committee representing the different stakeholders in the site. A scheme of coordination between the municipality, SSG, and the local committee is set in partnership with SPNL for the sustainable management of the Hima site.

2.7. General Measures for the Conservation of Agro-biodiversity in Lebanon

Relevant CBD thematic programme of work: Agriculture biodiversity

Goal 4: To protect Lebanon's agricultural diversity from degradation, and to maintain agricultural resources availability, while maximizing both environmental and economic benefits.

Objectives	Planned Actions	Relevant CBD articles and thematic programmes and cross-cutting issues	Status of implementation
1 To protect the agricultural ecosystems and to maintain native biological diversity.	Conduct environmental/ economic assessments for new construction projects, buildings, roads, etc., in agricultural areas.	-Impact Assessment	This issue is covered by the Law of Protection of Environment (Law444/02) and the EIA draft decree in general for all major projects including construction and infrastructure in all ecosystems including agriculture areas and the draft SEA decree for plans and programmes.. Although the EIA decree is not endorsed yet, EIA studies are requested for main projects prior their execution and submitted to MoE which undertakes their review and consequently provides its approval after verification of their compliance with environmental protection conditions and sustainability of natural resources. SEA decree was not endorsed as well, but the preparation of related studies for Master Plans and their submission to MoE for review was initiated since 2005.
	Provide more executive authority to the Ministry of Environment to protect agro-biodiversity.		The mandate of the Ministry of Environment according to law No. 690 issued in 2005 in relation to biodiversity is to protect the ecosystems and biodiversity; the identification of endangered species of fauna and flora and the measures to protect them; the designation, conservation and management of protected areas. However no specific prerogatives related to agro-biodiversity are given to MoE as per current laws and regulations.

	Implement legislation for the sustainable use of natural resources	Sustainable Use	The Agrobiodiversity project (1999- 2004) funded by GEF, implemented by UNDP and executed by LARI, has reviewed the national legislation related to biodiversity and nature protection in Lebanon and has drafted a policy for conservation of Agrobiodiversity in Lebanon and submitted it to the Ministry of Agriculture in 2005, however this policy was not yet officially endorsed by the Ministry. This policy included suggestion for different policies at various levels as follows: Policies for management of agricultural production Policies for rural development Policies for Protected areas Policies for eco tourism Policies for land use management Policies for maintaining information and database. In addition, in 2005, the MOE prepared a draft law regulating access to and benefit Sharing of biological and genetic resources of Lebanon, this draft law has not yet been forwarded for endorsement.
	Support research on sustainable use of resources applied agrobiodiversity, grazing pressure and biological diversity, and encourage research on native forage crops.	Research and Training	The Agrobiodiversity project supported 4 full MSc researches in agrobiodiversity related fields and 8 partial undergraduate researches from national universities between 2001 and 2005. In addition several trainings and workshops were conducted to more than 800 persons on areas related to the topic of agro-biodiversity. Trainings covered the following topics: integrated pest management, organic farming, orchard management, water harvesting, GIS techniques for applications on agro-biodiversity, plant taxonomy, NGO management, and tenure and natural ressources management, agro-food processing, in situ conservation, indigenous plant genetic ressources in sustainable agriculture, fruit tress nurseries, pasture management.
	Establish land use and zoning standards and policies.		In 2004, the Government of Lebanon has designed a general land use planning scheme for Lebanon which accounts for the need to increase protected areas at national scale, and recognizes the ecological and the agricultural and cultural values of the different zones in Lebanon. This general scheme (SDATL), have been unofficially followed by land use planners for the past 5 years. Recently in February 2009, the Council of Ministers (CoM) approved the adoption of this Master Plan in its Decision # 1. Based on the CoM decision, the related decree endorsing the Master Plan is in process of issuance.
	Establish traditional farms to maintain and propagate the traditional	Article9:Ex-Situ Conservation	The project on “Conservation and sustainable use of dryland agrobiodiveristy in Lebanon” aimed at promoting in situ and on farm conservation of landraces and wild relatives of important field crops, food and forage legumes and fruit trees species originating in the region.

	or "heritage" varieties or breeds that are being replaced by "modern" varieties.		The project thus supported the establishment of local nursery for the production of wild and local varieties of fruit trees with more than 40 000 seedlings/ plantlets (over a period of 4 years)
	Establish a service to facilitate the exchange of material between farms, and disseminate local or regional collection to appropriate sites	Article5: Cooperation	The project on Conservation and sustainable use of dryland agro-biodiversity in Lebanon" known as Agrobiodiversity project supported the establishment of local nursery for the production of wild and local varieties of fruit trees with more than 40 000 seedlings/ plantlets (over a period of 4 years).
	Establish nature reserves on several sites representing the major eco-geographical areas of Lebanon, that have a wide diversity of naturally growing plants and animals, and with as many wild relatives of agricultural crops as possible.	-Article8: In-situ Conservation	The Horsh Ehden nature reserve, Shouf Cedar Biosphere Reserve and Jabal Moussa Biosphere Reserve include wild relatives varieties but no specific action directly oriented to protecting wild relatives have been mentioned in Lebanon nor any initiative to declare any protected areas was directly oriented to the presence of wild relatives of agriculture crops.
	Establish at least one botanical garden for ex-situ conservation of perennial crops including cultivated trees, annuals and biennials.	-Article9: Ex-Situ Conservation	To date, no botanical garden is established in Lebanon for ex-situ conservation of Perennial crops including cultivated trees, annuals and biennials. A Mediterranean botanical garden is proposed at the American University of Beirut but funds for its establishment are lacking.
	Establish a central genebank, where the different aspects of ex-situ conservation are performed via 1) survey, collection and preservation of genetic resources; 2) evaluation and	-Article9: Ex-Situ Conservation	Most efforts in Lebanon have concentrated on in situ conservation, with few activities involving technology transfer for maintenance of ex situ collections, and no technology development. One notable *ex-situ* conservation activity is carried out under the LARI/MSB, KEW agreement, where wild plants are being conserved as seeds and as herbaria in trust for Lebanon within the MSB facility in Sussex, UK. On the other hand, within the context of the "Agrobiodiversity" project, more than 1200 seed samples of cereal, legume, and their wild relatives, previously collected in Lebanon, were

	documentation of the collected material; and 3) breeding based on clearly defined goals and objectives.		transferred by the end of June 2004 from the Seed bank of the International Center for Agricultural Research in the Dry Areas (ICARDA) to the AUB/AREC (Agricultural Research and Education Center) gene bank in Beqa'a. Currently LARI is conducting some dispersed activities on the characterization of local germplasm of olive and fruit species via morphological descriptors and molecular markers. Also LARI is carrying some breeding activities on wheat, barley, chick pea, within collaborative projects with ICARDA, where LARI has to experiment the new varieties before being released by ICARDA.
2. To protect agrobiodivers from deleterious agricultural practices, and to develop and implement policies and practices to minimize loss in genetic diversity.	Reduce excessiv use of agrochemicals through publications on integrated pest managemer broad-spectrum pesticides, multiple cropping/season, extension programmes, etc…	-Article14: Impact Assessment and Minimizing Adverse Impacts	Lebanon was part of an Italian funded regional project on "Near East Regional Integrated Pest Management programme" aiming to contribute to the achievement of food security through an Integrated Pest Management programme approach. The project was carried out in 2004-2007 and executed in Lebanon by the Ministry of Agriculture. Within the Agrobiodiversity project, an on-farm and on-station trials were used to demonstrate to farmers that seed cleaning and treatment can increase the grain yields of cereal and legume landraces by 17-82%. Incentives are now being provided to encourage farmers and communities to buy seed cleaning and treatment equipment, in order to develop efficient, informal seed-multiplication initiatives. The positive impacts of different water-harvesting and Integrated Pest Management techniques on target fruit-tree species were demonstrated to collaborating farmers.
	Implement environmental education in schools.	- Article 13: Public Education and awareness	The Agrobiodiversity project has promoted the introduction of biodiversity in education curriculum, by making available a Curriculum guide that was presented to the CRDP(National Center for Research and Development- a Governmental institution directly related to the Ministry of Education and is responsible for updating the Lebanese curricula.
	Develop agro-biodiversity extension programs and training centers.	Article 12: Research and Training	In 2005, the Project on Agro-biodiversity has supported the establishment of two new agricultural cooperatives and one agro food processing for women. Two local nurseries were also supported. The national capacity on agro-biodiversity was enhanced through extensive trainings and workshops organized by the project for farmers, technicians and NGOs. In addition, the project established in 2005 in the LARI's permises a permanent agro- biodiversity awareness unit on the values and importance of conserving agro biodiversity. It includes expositions, books, computers and other materials addressing scientists , students and the general public.

	Issue guidelines the conservation agro-biodiversity.		Answering the need for in situ and ex situ conservation of agro biodiversity, the agrobiodiversity project has established 3 filed gene banks for fig, grapes and almond local varieties as well as one for wild trees.
	Develop an education campaign on biodiversity conservation, to increase public awareness of the threats to agro-biodiversity	-Article 13: Public Education and Awareness	The Agrobiodiversity project has promoted the introduction of biodiversity in education curriculum, by making available a Curriculum guide that was presented to the CRDP (National Center for Research and development- Governmental institution directly related to the Ministry of Education and responsible for updating the Lebanese curricula). In addition the project organized a large awareness and education campaigns to the local farmers and local NGOs through extensive training sessions to increase public awareness of the importance of the agrobiodiversity and the need for its conservation in addition to brochures, posters, TV Spots, exhibition etc…
	Develop framework to assess the potential impact of agrochemical on biodiversity, and to identity the levels of biodiversity that likely to be affected.	- Article 14: Impact assessment and Minimizing adverse Impacts	To date, no efforts were invested to develop an integrated framework to assess the potential impact of agro chemicals on biodiversity and to identify the levels of biodiversity likely to be affected by such use.
	Develop incentives, taxation measures and penalties.	-Article 11: Incentive Measures -Economic, Trade and incentive measures	Chapter 3 of the Law of Protection of Environment (law 444/02) was dedicated to incentive measures, article 4 has addressed the polluter pay principle, Articles 54,55,56,57,58,61, 62 and 63 have addressed penalties on infractions to the environment. However, the enforcement of these measures still needs the development of relevant implementation decrees. A taxation policy is being applied by the the Ministry of Agriculture to encourage the production of pine nuts (or pinelets) from *Pinus pinea,* .the Ministry has set a maximum price for the kilogramme of pine nuts (20 USD) above which the top quality nuts should not be sold on the local market, in addition to the imposition of taxes on the import of nuts. This policy encourages the local production and pushes the consumer to give the priority to the local pine nuts. The Agro-biodiversity project executed from 1999 till 2004 by LARI/UNDP/GEF provided significant incentives to support the rural development activities, mainly: The project financed the establishment of fruit tree nurseries for production of around 10,000 seedlings per year of wild and local varieties

			aiming at their conservation and sustainable use. The nurseries are operated by a local NGO, the Aarsal Rural Development Association. The project also financed a regional training course conducted at the International Center for Agricultural Research in the Dry Areas (ICARDA) on establishment and management of a seed bank, attended by a national staff from LARI. YMCA (NGO), through USAID fund, established two agro-food processing centers in the Agrobiodiversity Project Sites of Nabha and Ham/Maaraboun in the Bekaa region. The equipment provided to the centers is co-shared between the project and YMCA. YMCA also provided intensive training (9 weeks) to the local women groupings to be able to operate the centers. The project and YMCA assist the women groupings to establish two cooperatives, which are the main beneficiaries from this initiative. A training course on orchard management and post-harvest practices was provided by the Agrobiodiversity project to farmers from the villages of Aarsal, Nabha, Ham and Maaraboun. All the above actions serve both as incentive for biodiversity conservation as well as social measure preventing rural areas from abandonment and contributing in poverty alleviation.
	Regulate grazing.	- Biological Diversity of Dry and Sub-Humid Lands	The Bekaa is one of the most sensitive areas that are submitted to the pressure of overgrazing. The agro-biodiversity project targeted many wild relatives and landraces varieties including cereals, forage legumes and wild fruit trees, aiming to serve in site restoration on heavily overgrazed areas. The pilot areas were selected as demonstration sites to solve problems of overgrazing because they were experiencing a quick loss in their Agrobiodiversity due to habitats conversion, adoption of new varieties and overgrazing. In order to regulate grazing, the Ministry of Agriculture has authority to monitor and regulate grazing on public lands but has also been granted authority to issue ministerial decisions forbidding access and grazing on private lands upon written request of the landowners.
	Develop a better understanding o the impacts of the lo of genetic variabilit due to chemical stress.	- Article 14: Impact assessment and Minimizing adverse Impacts	.

3. To establish a national biodiversity database for documentation and monitoring of biodiversity.	Assess the present status of agrobiodiversity at the national level.		Until 2000, Lebanon lacked gene banks that could be used as ex situ means for conserving agro biodiversity, and little knowledge was available on the overall status of agro biodiversity. The project has achieved considerable improvement in terms of government commitment (central and executing agencies), mainstreaming agro-biodiversity into reforestation programs, introducing agro biodiversity into the education curriculum, improving the staff involved, commitment of local communities as well as development of new projects.
	Support environmental and socio-economic research.	-Article 12: Research and Training	The Agrobiodiversity project as supported environmental and socio economic research by providing full support to 4 MSc degrees and 8 undergraduate BS degrees on topics related to agro biodiversity topics.
	Support all institutions involved in environmental and biodiversity conservation including municipalities.		The project provided support to the LARI (executing agency), Ministry of Agriculture, Ministry of Environment somewhat, as well as the municipalities in the pilot areas.
	Develop a national GIS lab.	-Article 12: Research and Training	The project has relied on the GIS technique and remote sensing to develop thematic maps and assist the assessment of dry land agro biodiversity in Lebanon. A national project to develop a national GIS lab and database has been initiated at the Directorate general of Geographic affairs in the Lebanese army, but the project has not yet been achieved to date.
	Develop guidelines and standards for designing and implementing an agrobiodiversity -monitoring network on arable land.	-Biological Diversity of Dry and Sub-Humid Lands	A draft project has been prepared for a GEF funding on "Applying agro biodiversity knowledge for effective up take in the near east" and the project has foreseen the development of guidelines and standards for designing and implementing a monitoring network on arable land.
	Establish a national database for crops, weeds and livestock, including a database for tracking livestock migration and immigration.	Article 7: Identification and Monitoring	The draft project on "Applying agro biodiversity knowledge for effective up take in the near east" mentioned above has foreseen as well the establishment a national database for crops, weeds and livestock in Lebanon .
	Establish an environmental research station to study the ecological changes over time.	- Article 12: Research and Training	Such a national environmental research station to study and monitor ecological changes is planned but not yet implemented for Lebanon.

4. To develop partnerships with the environmental community at the national, regional and international level.	Establish a natio biodiversity committee or department to oversee agrobiodiversity policies and programmes	-Article 18: Technical and Scientific Cooperation	No National Biodiversity Committee among relevant ministries and institutions was established
	Investigate potential linkages with the Biotrade Initiative, the ICGB Program and other international initiatives, particularly with regard to controlling bioprospecting and ensuring sustainable benefits	- Article 15: Access to Genetic Resources - Access to Genetic Resources and Benefit Sharing - Economic, Trade and incentive measures	A draft law was developed by the Ministry of Environment in 2005 regulating access to and benefit Sharing of biological and genetic resources of Lebanon, with GEF financial support through the UNDP/GEF Top-Up Biodiversity Enabling Activity project and technical assistance from IBSAR/AUB. According to the draft law, any person or entity that wishes to access the biological and genetic resources of Lebanon should file an application for that purpose with the Relevant Department at the Ministry of Environment. The application should be accompanied with a legalized Prior Informed Consent obtained from the owner or owners of the property or site where the biological and genetic resources will be collected, or from the government in the case of public land. If the application was approved, the Relevant Department of the Ministry of Environment shall invite the applicant as soon as practicable, to sign the Access and Benefit Sharing Agreement with the Ministry, the land owner or owners and/or the local communities where the biological and genetic resources are located which can of four types: 1) Academic research agreement, 2)Conservation biological and genetic resources agreement, 3) Commercial research agreement, 4) Commercial exploitation agreement. According to the draft law any scientific, medical, pharmaceutical, commercial, or legal results derived from the access to, use, research, experiments, and developments of the biological and genetic resources should be shared in a fair and equitable manner with the State and the local land owner or owners and communities whose biological and genetic resources were involved in the activity of the applicant. The sharing of such results shall be provided for in the Access and Benefit Sharing Agreement, which will describe the benefit sharing method that the parties to the agreement shall agree upon, and the share of each one of them. However, the law is not endorsed yet and these measures are not enforced currently.

			However, some initiatives have been executed in Lebanon regarding bioprospection by research and academic institutions within international collaboration: - The Bioprospection project executed by AUB in 2001 for a period of 5 years in collaboration with universities from the USA assessed the market potentials for plant species with potential medicinal, bioactive, and/or ornamental value, initiating production of plants with market potential and investigated the medicinal/agricultural potential of selected plant species to diversify the national agricultural portfolio and promote sustainable agro-industrial growth in rural communities. For this purpose propagation and on farm trials have been initiated with the intent to domesticate those species that prove to be with market value and to avoid overexploitation of wild species with medicinal and ornamental potential. -The Agrobiodiversity project (LARI/UNDP/GEF) has executed many activities that encourage sustainable use: the project has established two agro-food centers in the project's sites in the Bekaa region namely Ham and Nabha, it has provided support for a fruit trees nursery operated by a local NGO "ARDA" in one project site "Aarsal ", it has conducted training sessions on agro-food processing at ARDA premises for the cooperatives and women groupings in the Project Sites of Aarsal, Ham, Maaraboun and Nabha and has organized an international conference on "Promoting Community-Driven Conservation and Sustainable Use of Dryland Agro-biodiversity" at ICARDA (April 2005) and has provided training on organic farming to the local farmers in the projects sites and held a two-day training course, on "Good Governance and Management of Cooperatives".

2.8 In-Situ Biodiversity Conservation in Lebanon

Relevant CBD article: article8: In-Situ Conservation

Goal 5: To conserve biodiversity under natural conditions and establish a balanced ecosystem where plants and animals evolve naturally.

Objectives	Planned Actions	Relevant CBD articles and thematic programmes and cross-cutting issues	Status of implementation
1. Expand and manage the protected areas system terrestrial, marine and fresh water environments.	Introduce sustainable harvesting into some protected areas like honey production.	- Article 10: Sustainable Use	Sustainable harvesting in the majority of protected areas is introduced in form of honey production following training sessions on beekeeping and protection of milliferous plant species, processed food items out of wild fruits (molasses, jam, distilled rose water, etc) and wise collection of culinary and medicinal plant species from the surroundings of the nature reserves and their sale at the entrance of the nature reserves.
	Manage sites according to the local needs and requirements.		Collaborative management principles and common consensus among local communities to manage protected areas are adopted and applied by nature reserves' managers of marine, freshwater and forest environments.
	Lease lands for use and avoid ex-appropriation.		
	Recruit locals to work on site (guards, technicians, etc.) and provide suitable training.	-Economics, Trade and Incentive Measures - Article 13: Public education and Awareness	MOE pre-established Terms of Reference and procedures for jobs and positions for the management of the nature reserves and encourage to give the local communities from the surroundings of the protected areas the highest priority to work on sites as rangers, guides, managers, labors, technicians and to conduct required work such as establishment of infrastructures and other facilities.
	Characterize and classify protected areas. (mapping, protection, rehabilitation , updating inventories) .	- Article 7: Identification and Monitoring	The National category system for Protected Areas in Lebanon, emanating from a participatory approach (consultative meetings, round table, national workshop) resulted in 2005 in suggesting for Lebanon four categories of Protected Areas with clear guidelines for designation and defined management bodies. Legal endorsement of those suggested categories will require approval of the draft decree defining criteria for PAs designation in Lebanon prepared by SISPAM project (MoE/UNDP/EC-life) in collaboration with ECODIT Liban.
	Establish core (Biodiversity warehouses)		All existing protected areas include a core zone for biodiversity conservation along with a designation of a buffer zone.

	and buffer zones with access to fire-fighters and restricted vehicles.		Furthermore, the draft framework law on protected areas stipulates the designation within the nature reserves of two zones: a core zone of strict biodiversity conservation and a zone of sustainable development, in addition to a buffer zone surrounding the reserve. Arz el Chouf.Cedar Nature Reserves has established water ponds for forest fires fighting and is launching a project to establish a mechanism for detection and control of forest fires.
	Collect entry fees, and reduce prices for the local population.	-Economics, Trade and Incentive Measures -Biological Diversity and Tourism	the laws establishing and governing the existing nature reserves don't authorize the collection of entrance fees, they do not grant the legal status for the reserve committees to do this. The Ministry of Environment has prepared a Draft General Framework Law for Protected Areas that is still awaiting to be voted in the Council of Ministers and later in the parliament. The draft framework law accounts for the need to recognize the legal identity of the reserve committees granting them, among others, the right to collect entrance fees and to issue citations upon violations.
	Locate rehabilitation nurseries within the protected areas and use indigenous species		Al-Shouf Cedar Nature Reserve has established within the reserve a nursery of indigenous cedar trees using seeds from the reserve. The trees grown in the nursery will be used for reforestation activities. Two other nature reserves are planning to establish such nurseries.
	Set up recreational areas, tourist centres, and open-air theatres to attract visitors for enjoyment, education, participation and economic involvement.	-Economics, Trade and Incentive Measures -Article 13: Public Education and Awareness -Biological Diversity and Tourism	The protected areas of Lebanon have all management zones, including recreational areas and tourist facilities for visitor attraction, education and awareness raising.
	Set up, wherever possible, zoos, aquaria and aviaries for educational and touristic purposes.	- Article 9: Ex-situ conservation -Article 13: Public Education and Awareness -Biological Diversity and Tourism	An Animal encounter, a non-profit educational facility began in 1993 as a commitment to preserve Lebanese Wildlife. The center has assisted in the conservation of mammals, birds and reptiles. The encounter acts as rehabilitation center since it receives injured and orphan animals that are released back into nature after being fully recovered.

2.9. Urban Biodiversity Conservation

Goal 6:To conserve Biodiversity ex-situ, utilising existing capacities.

Objectives	Planned Actions	Relevant CBD articles and thematic programmes and cross-cutting issues	Status of implementation
1.To protect endemic species using urban and landscaping habitats.	Help in establishing zoos and aquaria.	- Article9: Ex-Situ Conservation	
	Expand public awareness and qualities of loca Biodiversity.		
	Apply strict regulations on imported germplasm (plants, animals fish , birds)	- Article 8 H: Alien species	Regulations on import of germplasms was established for LMOs and GMOs within the draft biosafety decree developed by the Ministry of Environment within the context of the UNEP_GEF Biosafety project (2003-2005) to implement the provisions of the Cartagena Protocol and to put necessary interim procedures to regulate transboundary movement, import, export and use of LMOs and GMOs. However the decree has not yet been submitted yet to parliament.
	Establish botanic gardens in cities national parks	-Article9: Ex-Situ Conservation	No national parks are established in Lebanon in urban areas No botanical gardens exist yet in Lebanon, but the Ministry of Education is in process of establishing a national botanical garden in Beirut. Collaboration was done between the Ministry of Education and the Ministry of Environment regarding the floral species in the garden whereby the Ministry of Environment has provided the Ministry of Education with the list of endemic species to be used in the garden, scientific and educative information regarding each species and the way of their distribution in the garden.
	Join efforts with municipalities and NGO's to use and conserve local germplasm.		Through the agro biodiversity project, coordination efforts to use and conserve germ plasm were implemented in north Bekaa, Ham, Maaarabboun, Nabha and Aarsal.
	Plant roadsides with endemic suitable plants which are numerous.		No specific efforts at national level to encourage nor undertake road sides plantation with endemic plants in urban areas. However, the IBSAR AUB, has launched a project "seeds for hope" aiming at encouraging community tree with native trees and shrubs especially in urban areas.

	Cover landfills, roadsides, roofs, balconies, etc., with local green vegetation.		- One of the requirements of MoE for rehabilitation of landfills after the end of its use, is to cover it with green vegetation - Planting green vegetation on roadsides is being executed by the relevant municipalities as per their mandates - Official enforcement measures are not required to cover balconies and roofs with green vegetation
	Establish germplasm bank cryofrigeration and tissue cultu technologies to conserve living material.	-Article9: Ex-Situ Conservation	Currently LARI is conducting some dispersed activities on the characterization of local germplasm of olive and fruit species via morphological descriptors and molecular markers. Also LARI is carrying some breeding activities on wheat, barley, chick pea, within collaborative projects with ICARDA , where LARI has to experiment the new varieties before being released by ICARDA.

2.10. Biosafety

Relevant CBD article: Article 8: Notification
Article 19: Handling of Biotechnology and Distribution of Benefits

Goal 7: To protect natural ecosystems from invading species.

Objectives	Planned Actions	Relevant CBD articles and thematic programmes and cross-cutting issues	Status of implementation
1.To protect natural ecosystems and indigenous genetic biodiversity from the purposeful introduction or accidental release of exotic or genetically engineered plant and animal species. .	Encourage the use of native rather than introduced species for aquaculture, mariculture and agriculture.	- Article 8H: Alien Species	In the National Reforestation Plan executed by the Ministry of Environment since 2002 in all Lebanese territories for rehabilitation and restoration of degraded forest areas, only the use of native forest trees in the reforestation activities was allowed with specific ban of the utilization of introduced species. Otherwise, very limited measures are taken in Lebanon to identify and prevent the introduction of alien species in Lebanon and to encourage native species. Only one Ministerial decision was issued by the Minister of Agriculture in 12 September 1995 to stop the introduction in response to the uncontrolled introduction of alien trees from the *Cedrus* genus through the ornamental industry, this decision (Dec. 108/1) prohibits the import and introduction of any Cedar seeds, seedlings and plants. Laws establishing nature reserves prohibit the introduction of any alien species to the reserve and the developed management plans the eradication of those alien species that may threaten ecosystems, habitats or species. Within the frame of the National Biosafety Framework elaborated under the Biosafety project (2003-2005), the issue of trading partners and neighboring countries in relation to the introduction of LMOs and control of threats of LMOs which might be invasive species to biodiversity is being addressed. However, the biosafety regulations are not applied yet. The fauna and flora of freshwater of Lebanon account for 987 species (Al-Zein, 1997). There are 25 fish species pertaining to different families: *Cyprinidae, Cyprinodontidae, Cobitidae, Salmonidae, Anguillidae, Cichlidae, Mugilidae, Puciliidae, Blenniidae, Lutjanidea.* In addition to these, other species have been introduced: rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta fario*; Al Zein, 1997), brook trout (*Salvelinus fontinalis*), common carp

			(*Cyprinus carpio*), mosquito fish (*Gambusia affinis*), silver carp (*Hypophthalmichthys molitrix*), mangrove red snapper (*Lutjanus argentimaculatus*), nomadic jellyfish (*Rhopilema nomadica*), narrow-barred Spanish mackerel (*Scomberomorus commerson*) and obtuse barracuda (*Sphyraena obtusata*). Some were introduced from other countries/regions such as the Red Sea *(Rhopilema nomadica, Scomberomorus commerson).* Others were introduced for sports purposes in addition to aquaculture *(Salvelinus fontinalis).* Other species were introduced to control different pests, for example snails *(Cyprinus carpio),* mosquitoes *(Gambusia affinis)* and weed *(Hypophthalmichthys molitrix).* The accidental or intended release of these exotic species into water bodies hosting native species may cause economic damage by (1) hybridizing with valuable species and producing worthless crossbreeds, (2) carrying or supporting harmful pests, and (3) possibly reducing recreational prospects in an area.
	Establish environmental screening procedures for importation of plant and animal species. Ban or strictly control the import of potentially invasive species, and establish quarantine controls on all imports.	-Article 8H: Alien Species	Necessary interim procedures to regulate transboundary movement, import, export , use etc.… of LMOs and GMos were established under the draft biosafety decree developed by the Ministry of Environment the context of the UNEP_GEF Biosafety project (2003-2005) to implement the provisions of the Cartagena Protocol, however the decree is not endorsed yet. Within the frame of the National Biosafety Framework elaborated by the above mentioned project, the issue of trading partners and neighboring countries in relation to the control of threats of LMOs which might be invasive species to biodiversity is being addressed. Moreover, the NBF addressed also the issue of risk assessment for the threats of imported GMOs and LMOs However, these measures are not implemented yet, waiting for the endorsement of biosafety decree mentioned above. In addition, assessment used to address threats of invasive alien species is mainly used in protected areas and to a lesser extent in forestry. The decisions pertaining to the consent for intentional introduction of alien species are issued after having performed assessment of risk that an introduced species might pose to native biodiversity. However, the methods for risk assessment are not specified. The risk posed by alien species is taken into account in EIAs for planned ventures and strategies to a small degree, at least until the draft EIA and SEA decrees are ratified. Decision banning the import of alien species was only taken for Cedar trees. Invasive Alien Species are not yet considered a major threat to biodiversity in the country nor recognized as key element of strategy development.

			Regarding quarantine control on imported species: The animal quarantine is related to the Directorate of Animals Resources at the Ministry of Agriculture. The Directorate follows the guidelines of the IAO (International Animal Organization) when it imports animal species and consequently prohibits the import of any animal species if it is prohibited by the IAO. On the other hand, the Directorate requires for the import of the species a certificate of origin, a health certificate and a CITES permit to species listed in Annex 1 of CITES. Concerning the import of plants species, it is regulated by the agriculture quarantine under the Directorate of Agriculture Resources of the Ministry of Agriculture. The latter issues regular ministerial decisions specifying the species prohibited for import according to several criteria of which country of origin, health requirements etc…A certificate of origin and a health certificate are required for the import of plant species.
	Establish an expert committee on biotechnology and genetic engineering to advise on regulatory requirements for dealing with biotechnology and genetically engineered organisms.		The draft biosafety decree developed in 2005 has stipulated the establishment of a National Bosafety Council which includes representatives from all concerned organizations to assist and advise on regulatory requirements dealing with the transboundary movement and use of LMOs and to carry out risk assessment associated with said LMOs. However the decree is still a draft and is not endorsed yet.
	Develop biosafety policy, legislation and regulations dealing with the handling, release and disposal of exotic or genetically engineered organisms		Lebanon ratified the Cartagena Protocol on Biosafety through law No. 31. dated 16/10/2008. A National Biosafety Framework was developed in 2005 by the Ministry of Environment with the support of UNEP/GEF and UNDP. A draft decree to implement article 8 and 19 of the CBD and the provisions of the Cartagena Protocol was developed by The Ministry of Environment in 2005 with support of UNEP/GEF and UNDP. The draft decree provide the necessary interim procedures to regulate the transboundary movement, import, export. Passage in transit, contained use, release into environment, direct use as food, feed, and processing, handling, transportation, use in research and testing, and placing on the market, of goods containing LMOs with the aim of protecting the environment and the humans from the potential negative effects of the LMOs. However the decree is not endorsed yet.

2.11. International Cooperation

Relevant CBD article: article 5: Cooperation
Goal 8: To share global responsibilities in use; conservation and management of biodiversity.

Objectives	Planned Actions	Relevant CBD articles and thematic programmes and cross-cutting issue	Status of implementation
1.To ensure effective participation in international and regional conventions, protocols, agreements and technical programmes regarding biodiversity.	Review all international and regional conventions, protocols and agreements regarding biodiversity to determine their relevance to the State of Lebanon, and prepare a framework for effective participation.	- Article 5 (Cooperation)	Lebanon has ratified the major biodiversity related international Conventions and Agreements namely: CBD, Ramsar, UNESCO World Heritage Convention, Barcelona Convention and its protocols mainly the Protocol on specially protected areas and biological diversity, AEWA, ACCOBAMS. However, a framework for effective implementation was not developed for all these Treaties. Lebanon has not ratified yet CITES and CMS.
	Co-ordinate and minimize overlap in reporting.	- Article 17: Exchange of information	Coordination is established among national focal points of different international Conventions ratified by Lebanon but not in a methodical way and no systematic mechanism was elaborated nor for coordination neither for minimizing overlapping in national reports.
	Review bilateral and multilateral development and technical assistance programmes related to biodiversity or having biodiversity components, and prepare a framework to optimize participation	- Article 18: Technical and scientific cooperation	There is a continuous seek for assistance programmes to implement projects and activities related to biodiversity, project proposals are being continually prepared to mobilize necessary funds from related donors in the biodiversity field however no framework has been set to optimize participation.
	Ensure that all development assistance agencies with programmes in Lebanon are aware of the Biodiversity Strategy and Action Plan, and develop a framework for inter-ministerial co-ordination to prevent conflicting externally supported development activities.	- Article 20: Financial Resources	The NBSAP was submitted to concerned institutions following its development; project proposals are prepared by relevant institutions each within the component relevant to its mandate and submitted to donors to attract projects in related biodiversity field. However, no specific framework was set for inter-ministerial coordination in this purpose.
	Establish a centralized co-ordinating body (National Biodiversity Unit).	- Article 18: Technical and scientific cooperation	A centralized coordinating body for biodiversity issues among relevant different institutions in Lebanon was not established.

2.12. Strategy Implementation

Goal 9: To share knowledge, costs and benefits with individuals and communities.

Objectives	Planned Actions	Relevant CBD articles and thematic programmes and cross-cutting issue	Status of implementation
1. To implement the strategy and action plan in partnership with all relevant organizations.	Strike a National Biodiversity Committee to oversee strategy and action plan implementation.	- Article 18: Technical and Scientific Cooperation	The Department of Ecosystems at the Ministry of Environment is in charge of organizing activities related to the conservation, study and use of Biodiversity and the follow-up of the implementation of the CBD, however no coordination committee among ministries and relevant institutions was established for monitoring and coordination strategy and action plan implementationt.
	Establish a National Biodiversity Unit to co-ordinate, oversee and organize activities related to the conservation, study and use of Biodiversity.	- Article 18: Technical and Scientific Cooperation	
	Explore and implement funding arrangements for both priority and long-term activities identified in the strategy and action plan.	- Article 21: Financial Mechanism	Financial resources are constantly explored and funds were mobilized from international donors namely the GEF, FFEM, EC-life Third Country to execute projects implementing the actions of the NBSAP mainly enabling activities projects for biodiversity and biosafety, protected areas related projects, agrobiodiversity project, projects related to sustainable hunting and protection of migratory birds species and recently project on mainstreaming biodiversity consideration into medicinal and aromatic production processes and on safeguarding and restoring Lebanon's woodland resources. However, national funds was mainly allocated and in considerable amount to implement a national reforestation plan in all Lebanese territories.
	Develop appropriate institutional arrangements for effective strategy and action plan.	-Article6: General measures for conservation and sustainable use	Institutional systematic arrangements for effective strategy and action plan implementation are still lacking.

2.13. Obstacles and challenges in the implementation of the NBSAP

The implementation of the NBSAP must be realized (carried out) by different ministries and stakeholders in the field of biodiversity and other relevant sectoral and cross-sectoral fields.
Thus, one of the major challenges in the implementation of the NBSAP is the limited involvement of the other different concerned ministries and institutions responsible for its implementation and the lack of a systematic coordination mechanism. In addition to the lack of awareness about the importance of biodiversity at the level of decision makers in other relevant sectors leading to an insufficient mainstreaming and integration of biodiversity considerations into other sectoral and cross-sectoral planning and programmes.
When it was developed, the NBSAP proposed a coordination unit which would be in charge of monitoring and coordination the implementation of the strategy however this unit has not been established.
Furthermore, the political instability in the country impedes the adequate implementation.

Resources availability

To date, many activities for the implementation of the Convention and the NBSAP are done through projects financed mainly by the GEF and to certain extent by other donors (FFEM, EC-life Third Countries). However, the financial resources are still inadequate to effectively implement the NBSAP and for coordination and monitoring of activities in the field of biodiversity. Furthermore, there is a lack of human resources to cover all the themes and programmes of the CBD and a need to further adequate scientific capacities to support all the objectives.

CHAPTER III
SECTORAL AND CROSS-SECTORAL INTEGRATION OF BIODIVERSITY CONSIDERATIONS

3.1 BACKGROUND

Article 6(b) of the Convention on Biological Diversity (CBD) states that each Contracting Party shall with its particular conditions and capabilities, integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral and cross-sectoral plans, programmes and policies.

The National Biodiversity Strategy and Action Plan (NBSAP) developed by the Ministry of Environment (MoE) in 1998 with the support of UNDP/GEF has included in its Action Agenda many actions aiming at the conservation and sustainable use of biodiversity which are related to different sectors and that fall under the responsibilities of many ministries and institutions such as the Ministries of Agriculture, Energy and Water, Education, Communication, Public works and Transport, Interior and Municipalities, Tourism etc… in addition to research institutions, academic institutions and NGOs thus providing the basis of mainstreaming biodiversity considerations into other relevant sectors such us agriculture, fishery, forestry, urban planning, tourism, industry etc…

Representatives from the concerned mentioned institutions were part of the steering committee that supervised the development of the NBSAP which lasted for one year and involved 12 national experts and two international consultants.

The extent of implementation of the NBSAP is covered by chapter 2 of this report, but one of the main challenges in its implementation was the involvement of the other different concerned ministries besides the Ministry of Environment, in the implementation of the activities of the NBSAP that fall under their prerogatives thus the integration by these concerned institutions of the conservation of biodiversity and sustainable use into their plans and programmes.

The principle of biodiversity protection was adopted by the law for the Protection of Environment (Law No.444 dated 29/7/2002). The principle stipulates that all activities should avoid causing damages to the different components of the biodiversity.

In addition, the law 444 has dedicated an entire chapter for the management of natural resources and conservation on biological diversity - specifically articles 47 to 49 which call for the protection and sustainable use of biodiversity, the establishment of nature reserves, regulating access to genetic resources and for public participation as well public and private institutions participation in the conservation of biodiversity and the sustainable use of natural resources. Furthermore, the Law for the Law 444 endorsed the EIA principle in its article 4; the law states that this principle should be used as a planning and management tool for preventing pollution and minimizing degradation of natural resources. Impact Assessment was addressed in particular through articles 21, 22 and 23 of the law.

With regards to other sectors besides the environment, chapter 3 will provide a description of the extent to which biodiversity has been integrated into relevant sectors and cross-sectoral plans, programmes and policies. The chapter reveals that some programmes have mainstreamed environmental considerations but most of them didn't not tackle specifically biodiversity, some others have addressed biodiversity among other environmental components and some has not integrated even significantly environmental considerations.

3.2. Government Policy Statement: (2008-2009)

The Government Policy Statement issued on 5/8/2008 has included an entire section related to the environment, this section covered nature resources and green cover but not specifically biodiversity.

The statement affirmed that "*The Government of Lebanon is keen at protecting Lebanon's natural resources as it is concerned in providing a good life quality to the Lebanese generations, present and future. That is why the Government shall seek to establish a sustained environmental development through supporting the cooperation between the private and the public sector locally, regionally and internationally, as well as incorporating environmental principles in the policies and programs of all development sectors, and activating the legislation, monitoring and guiding role of the Ministry of Environment*".

In addition the Government confirmed in its statement that "*On the international level, the Government shall continue implementing and concluding environmental conventions, treaties and protocols*". In relation to the green cover and water resources, the Government states that "The *Government shall seek to expand Lebanon's green cover through strengthening the management (both prevention and fighting) of fire catastrophes and forestation, land rehabilitation, and protection of Lebanon's water capita as a basic economic resource*"

3.3. National Plans, Policies and Programmes related to main sectors:

a) Forestry:

The "National Reforestation Plan"

The "National Reforestation Plan" (NRP) prepared by the Ministry of Environment in 2001 and executed till then, has referred explicitly to the Convention on Biological diversity and took into considerations its provisions. The NRP has only allowed the use of indigenous forestry species in the reforestation activities prohibiting the use of any alien species and has specified the native species to be used in the reforestation activities in each site according to the ecological criteria and the climate and the soil characteristics in the related ecosystem.
In addition, the NRP prohibited any techniques during the land preparation that may cause any loss or harm to the biodiversity in the site, by stating that "*During the land preparation, we must conserve the biological diversity by minimizing as much as possible the extraction of the existing wild plants in the site* "

It should be noted that the NRP mentioned in its first section related to the current status of degraded lands and forests in Lebanon, the threats that the biodiversity is facing due to the habitats loss, as one of the need for the development and execution of the NRP and it has highlighted the importance of habitats protection to ensure the survival of animal and plant species and their multiplication.

The "National Strategy for Forest Fires"

The "National Strategy for Forest Fires" in Lebanon developed in 2009 by the Ministry of Environment, IUCN, and a local NGO "the Association for Forests, Development and Conservation" (AFDC) has promoted the prevention and combating of forest fires and rehabilitation of degraded lands and the enhancement of synergy and coordination between all concerned institutions responsible for forests and forest fires in Lebanon. Accordingly, the Strategy promoted the conservation of forest biodiversity and ecosystems and the mitigation of the threats to natural forest habitats and species.

The National Strategy was officially endorsed by the Council of Ministers in May 2009 and the future steps will be the implementation of the Strategy through the execution of its various activities.

General Status of forest biodiversity:

Despite the efforts deployed for launching and promoting awareness among local communities on the importance of forest biodiversity being a source of income, there is no real implementation of project aiming at sustainable use of forest resources. Therefore still the resources are over-exploited. Although three conventions have been ratified in this regard (Convention on Biological Diversity, Combating desertification convention and Climate Change convention) still there are constraints related to the enforcement of laws related to forest management and exploitation and the mainstreaming of action plans into implementation of activities. Given the shy initiatives undertaken, more coordination among ministries, scientists in addition to providing needed equipments are needed to promote effective sustainable use of forest biodiversity.

Some studies were undertaken in relation to sustainable use of forest biodiversity for example within the frame of the bio- prospection project at AUB and through the initiatives of some private NGOs.

Overall, there is a strong need to mainstream the efforts into a comprehensive strategy for forest management.

b) Hunting:

The Hunting Law

The Hunting Law (Law no. 580 dated 25/2 /2004) has integrated sustainable hunting in Lebanon and has referred explicitly to abide to the biodiversity related Conventions and Agreements and their provisions. The law states that defining hunting season and the permitted time for hunting, shall take into consideration the principle of sustainability of natural heritage stipulated in the international conventions ratified by Lebanon. Furthermore, the law requires that during the identification of animal and bird of prey, animal and bird species for which hunting is totally banned, special ban must be done for bird & animal species that are useful for the ecological balance or for the purpose of increasing their numbers locally or for the globally threatened species listed in the relevant international conventions ratified by Lebanon and those listed in the IUCN Red list.

The Law states as well that, with the aim of conserving the biological diversity and the ecological balance, decisions shall be taken regarding the establishment of breeding centers for various wild birds and animals on the condition that these species must be native species or migratory species that cross Lebanon during their natural migratory routes specifically the threatened species for the purpose of increasing their numbers and then release them back to the wild.

The Hunting Law also prohibited in any season to snatch nests, or take, destroy, sell, buy, transport, grab, or hurt eggs, chicks, or juveniles' wild animals. Moreover the Law prohibited the export of eggs or the new offspring of any wild bird or animal (except for the wild animals that are bred in farms) as well as the young of furred animals. Moreover, the hunting law banned the export of hunted preys without a special permit from the Ministry of Environment.

The Law allowed only for scientific researchers to capture wild animals or birds for research reasons on the basis to release back these species to the nature alive and unharmed, also scientific researchers are allowed to take eggs for research purposes, these researchers should obtain a special license based on an application submitted to the National Center for Scientific Research.

c) Agriculture

C.1 Agrobiodiversity

In relation to the conservation and sustainable use of agricultural biodiversity, Lebanon has proved its ability to elaborate on policies, strategies and national plans however what is lacking is a long term vision with clear setting of priorities; implementation of activities and the adaptation of various components related to a certain sector into the different hierarchical systems of ministries and institutions.

With grant funding from the GEF, Lebanon was part of a regional project (Jordan, Palestine, Lebanon, and Syria) on the "**Conservation and Sustainable Use of Dryland Agrobiodiversity in the Near East**". This five-year project (1999-2004) was implemented in Lebanon by the Lebanese Agriculture Research Institute (LARI) and UNDP and brought together several international organizations. Implementing partners included several local academic and research institutions and NGOs. Many experts were involved in this project to characterize the floristic richness and study the genetic diversity and potential uses of selected species. The project aimed at promoting the conservation and preservation of important wild relatives and landraces of agricultural species by introducing and testing in-situ and on-farm mechanisms and techniques of conservation and sustainable use of agro-biodiversity in three pilot sites located in mountainous dry areas in Lebanon.

The Agrobiodiversity project prepared a study that proposes the mechanism for the national domestication of international conventions and agreements, through a thorough review of international conventions and agreements related to the conservation and sustainable use of agrobiodiversity, that have been ratified by the Lebanese government or that are expected to be ratified in the future. It has worked on the establishment of national plant genetic resources (PGR) programme in Lebanon. The objective of this PGR programme is to regulate the conservation and exchange of the national plant genetic resources by setting the scientific, administrative, institutional and legal framework for this sector, in the light of the international and regional relevant agreements and conventions that were ratified by Lebanon. However this PGR programme was not executed yet. On the other hand, the project formulated policy options at the farm-household, community and national levels that promote sustainable agrobiodiversity conservation and sustainable management of natural resources. Those recommendations for policy options were followed up by a scientific committee within LARI, however no real follow up nor implementation of these recommendations were done because of lack of financial and human ressources for proper execution.

Aiming to secure sustainability for the agro biodiversity project, a follow up committee was created at LARI, as well as the staff in LARI followed intensive trainings for capacity building, and a special unit concerned with agro-biodiversity was created at LARI, along with an agro-biodiversity awareness unit.

The project has also mainstreamed the use of wild fruit tree species in national reforestation programmes and promoted the introduction of biodiversity in education curriculum, by making available a Curriculum guide that was presented to the CRDP (National Center for Research and development) which is related directly to the Ministry of Education and is responsible for updating the Lebanese curricula.

The Agro-biodiversity project has also prepared two proposals that were submitted to GEF for funding, on basis of the achievements of the project, one of which is related to "Mainstreaming Biodiversity management considerations into medicinal and aromatic plants production processes" (simply known as Medicinal plant project).

The project "Mainstreaming Biodiversity Management Considerations into Medicinal Plants Production Processes" started in July 2008 for a period of 4 years project and is executed by the LARI and UNDP. The purpose of the project is to create a network of small community based enterprises who would work as a center for collecting and distributing the fresh material collected from the wild, and to introduce a certification system for sustainable harvesting of wild medicinal and aromatic plants, builds on the general rules adopted by IUCN and WWF. The overall objective is to integrate conservation objectives into the gathering, processing and marketing of globally significant Medicinal and Aromatic Plants (MAPs) in Lebanon.

The project will basically follow the ISSC-MAP standard, on order to better ensure the long-term sustainability of MAP in their natural habitats while respecting the traditions, cultures, and livelihoods of all stakeholders. ISSC-MAP serves to provide a framework of principles and criteria that can be applied to the management of MAP species and their ecosystems, and serve as a basis for monitoring and reporting on these species, and recommend requirements for certification of sustainable wild collection of MAP resources.
The project foresees several actions aiming to mainstream biodiversity considerations into the medicinal plant production processes mainly through for collectors on plant identification and sustainable harvesting techniques.

On the other hand, following the 2006 July conflict in Lebanon, a project on "Promoting Cultivation of Medicinal and Aromatic Plants for Livelihood Recovery in South Lebanon" was launched. This project derives from the south recovery plan targeted areas in which livelihood was negatively affected by the widespread problem of cluster bombs, including those who depend on additional income generation from the collection, primary processing and marketing of Medicinal and Aromatic Plants (MAPs).
MAP cultivation can be an alternative for wild harvesting in affected areas, offering high level of yield with minimum inputs, in particular cultivation of *Origanum syriacum* (Origano) and *Salvia fruticosa* (Sage), two MAPs in Lebanon of significant economic value.

C.2 National Agriculture Strategy

Lebanon's agricultural policy is, as in many other countries, conceived within the overall national economic policy framework. While, agriculture is considered as an important and critical economic sector, no special or specific policies were developed that contradicted or deviated from the general liberal and non-interventionist economic policy stance. Lebanon has pursued a liberal economic policy ever since independence. This policy restricted the government to the development of the required social infrastructure and to maintaining a policy environment favorable to free trade. The public sector invested heavily in building an extensive infrastructure of trade routes, ports, airports, warehouses, and an excellent communication network. Unfortunately, this same policy framework also required the government to restrict its activity in promoting competing commodity producing sectors or regions that could undermine the dominance and the free flow of imports. The accepted liberal policy framework also called for a pro free trade, pro business policy environment with minimal government interference, low or no income taxes, bank secrecy laws and a free foreign exchange market.

In 2004, the Ministry of Agriculture, in the frame of the FAO/LEB 016 project, has published a five years "Strategy for Agricultural Development in Lebanon". This strategy recognizes the need to account for the impacts (positive and negative) of current agricultural practices on natural ressources and on biodiversity. It specifically stresses on the need to develop agriculture in respect with the conservation of both natural ressources and biodiversity in line with the carrying capacity of marginalized lands (appendix 3, paragraph 4.a). The Ministry of Agriculture is currently planning to start soon revising and updating its Strategy for Agricultural Development.

Moreover, the LARI, has developed in 2006 a Global Plan for genetic ressources, aiming to establish a national information Sharing mechanism on the implementation of the global action plan on plant genetic ressources. The action plan was ready since 2006, but the unstable socio economic events that overruled in Lebanon since 2006, seriously delayed its effective implementation.

C.3 Examples of other Projects related to Agriculture

In Lebanon, organic farming is being applied through different projects and initiatives implemented by various academic institutions, international organizations and private initiatives thus promoting agriculture practices with less negative impacts on environment and biodiversity, one example is the three year programme executed by World Vision and the United States Agency for International Development (USAID) and achieved in 2008. This progamme helped hundreds of Lebanese farmers grow organic agriculture in Lebanon. The programme - called the Sustainable Agri-Business Initiative for Lebanon - directly helped 800 farmers and over 4500 people in total.

On the other hand, another programme called CEDARSplus funded by USAID and CHF (Cooperative Housing Foundation) in the north and by USAID, CHF and Mercy Corp in the south has an underlying strategy aiming at increasing the quality of olive oil to meet international standards and promote market diversification by targeting high-valued niches. The programme activities are designed to increase yields and improve processing efficiencies.

The "Export Plus Program " that was launched by the Lebanese Government through Investment Development Authority of Lebanon (IDAL) in 2001, based on the decree number 6041/2001, aiming at supporting the Lebanese agricultural exports is still in place. Of this program's aims:

- To supervise the quality of agricultural exports and ensure compliance with international standards, and
- To transfer technology & know-how to farmers and exporters.

The Export-plus Program minimizes detrimental impact on the environment, reduces the use of agrochemicals, promotes organic farming and improves the efficiency of natural resource use.

d) Fishery:

The law for fisheries in Lebanon dates back to 1928, and since 2004 the Ministry of Agriculture has worked with the FAO to update it on basis of field data collection. A draft amended law, including list of allowed and banned species, as well as fishing seasons and methods, was prepared and submitted to fishermen and cooperatives of fishermen to seek their comments, but to date, no consensus has been reached related to this draft amended law. Moreover, many constraints are preventing this draft law to move forwards and the statu quo is still the ongoing status of this text.

On the other hand, the MoA has issued many decisions regulating fisheries practices that prohibit the use of trawling nets or putting specific criteria to the trawling nets, prohibit fishing by dynamites and shotguns, defining the type and instruments of fishing, defining specific legal size of fishes and mollusks that are subject to fishing, transport, purchase and import. These decisions if well enforced contribute to the sustainable fishing of marine species and their conservation.

In relation directly to endangered and rare marine species, the MoA has banned through decision No. 125/1 dated 23/9/1999 the fishing of whales, monk seal and marine turtles in all the Lebanese coast, and the trade of these species or their derivatives.

However, what is needed is the effective enforcement of all the above mentioned ministerial decisions.

On another hand, following the July 2006 oil spill catastrophe that occurred along the Lebanese coasts resulting from 2006 war, an International Assistance Action Plan on Lebanon marine and coastal oil pollution was prepared by the experts working group for Lebanon supervised by REMPEC. The clean-up activities undertaken under this action plan have indirectly benefitted the fisheries sector and biodiversity marine habitats.

The clean up process was not specifically assessed in terms of impact on biodiversity except on Palm Island Nature reserve which was harshly affected by the oil spill. However, precise assessment of the impact of the oil spill and the clean up was not possible since pre and post status were evaluated by different methodologies and approaches which renders comparison almost impossible. Nonetheless, the American University of Beirut in 2007 (through an assessment project co-managed by MoE & IUCN Center for Mediterranean Cooperation and funded by the Italian Government) and a delegation from the Spanish Agency for International Cooperation in October 2008 and February 2009 (through a project executed in partnership with MoE), have assessed the effect of the oil spill on the biophysical environment of the islands and carried out biodiversity survey and monitoring and have reported the state of the ecosystem on Palm Island Reserve to be “in resilient” status.

Furthermore, due to the damages caused by the oil spill to the different fishing equipments and engines of the fishermen, UNDP had allocated 1.1 million USD to help the Fishermen’s Associations in Lebanon by repairing their damaged boats as well as providing them with fishing nets and engines, and rebuilding the fish market in selected areas.

e) Urban Planning:

National Master Plan for land Management in Lebanon/ Shema Directeur d’Amenagement du Territoire Libanais (SDATL):

A National Master Plan for land Management was prepared for Lebanon by the Council for Development and Reconstruction in 2004 to reinforce the following objectives:

- Unity of the country
- Balanced development of regions
- Optimal and sustainable exploitation of resources
- Reduction of the State's debts
- Improvement of productivity and economic growth
- A more even foreign trade balance
- Improvement of living conditions
- Protection of the environment
- Preservation of the heritage

These objectives paint the picture of an "ideal" future that is not difficult to imagine: a prosperous and unified Lebanon that respects and emphasizes the importance of its resources and heritage, rationalizing its public expenditure and ensuring high quality public services.

Volume 2 of the SDATL is entirely dedicated to natural ressources and environment, and chapter 3 deals with natural ecosystems and presents a detailed description of terrestrial and marine ecosystems with a specific focus on biodiversity aspects and the risks faced by biodiversity conservation. This approach has lead to defining sensitive areas in terms of biodiversity which were considered when suggesting the ecological network and the importance of valuing and conserving natural assets by promoting ecotourism and conservation of biological reservoirs.

In 26 February 2009, the Council of Ministers (CoM) approved in its Decision # 1 the adoption of this Master Plan. Based on the CoM decision, the related decree endorsing the Master Plan is in process of issuance.

With reference to decision #1/2009, the execution of the SDATL must be done by the concerned ministries and institutions through decisions issued by the Council of Ministers.

Therefore, the SDATL becomes a reference document for the different concerned administrations as follows:

- The Directorate General for Urban Planning will have to take into consideration the recommendation listed in the SDATL, when suggesting, revising or approving land use maps.
- Concerned ministries (Agriculture, Environment, Public Works and Transport, Water & Energy, Industry, Economy and the Directorate General of Antiquities) will have to refer to the SDATL when taking decisions related to natural environment issues.

f) Industry:

At present, no plan for the industrial sector has been developed at national level, but the Ministry of Industry has established “National Industrial Permits Committees” in each Governorate to advise on the issuance of permits for industrial establishments. Each committee is headed by the Ministry of Industry and includes one representative from each of the following institutions: Ministry of Health, Ministry of Environment and Directorate General of Urban Planning.

After that the permit’s applicant got the approval of the related municipality, he submits the permit application to the Ministry of Industry which transfer it to the concerned institutions mentioned above for review and verification of its compliance with the criteria and conditions related to their respective sector. The Ministry of Environment undertakes the review of the application in terms of the location of the concerned industrial establishment, legal documents and the activity of the industrial establishment. Accordingly the MoE either refuses the application due to the potential enormous threats that may occur from the industrial establishment to the environment and that cannot be alleviate by any mitigation measure, or gives its approval after defining the necessary environmental conditions for the construction and operation of the establishment. These conditions aim at the prevention of the threats that may cause the industrial activity on any component of the surrounding environment including natural resources and biodiversity.

The Ministry of Environment along with the other institutions which are members of the “National Industrial Permits Committee” in each Governorate, submits its decision to the head of the committee who send its final decision to the Ministry of Industry. Accordingly, the Minister of Industry issues the permit to the concerned industrial establishment.

It is worth to mention here, that in some cases and according to the extent of the potential threats that may arise from the industrial establishment, the Ministry of Environment requests an EIA or IEE study for the establishment rather than just defining environmental conditions.

g) Economy and Trade:
In 2007, ESCWA as member of the Joint Secretariat along with the League of Arab States CAMRE Secretariat (Council of Arab Ministers Responsible for the Environment) and UNEP/ROWA (Regional Office for West Asia), are responsible for coordinating the Regional Program on Trade and Environment Capacity Building in the Arab Region. The program seeks to provide a platform for a variety of technical assistance and training support on trade and environment issues within the context of the global trading system, specifically on four pillars related to market access, competitiveness, dispute resolution the implementation of trade-related multilateral environmental agreements (such as the CBD).

ESCWA (as one of the five Regional Commissions of the UN (ESCWA, ECA, ESCAP, ECLAC and ECE) has signed on 25 October 2007, a Memorandum of Understanding with the CBD Secretariat to promote joint activities aiming to support mainstreaming of biodiversity topics into sustainable development and socio-economic plans and projects.

Under the leadership of the University of Manchster, ESCWA cooperated with other partners to prepare the sustainability impact assessment of the Euro-Mediterranean Free Trade Area (SIA/EMFTA) between 2004 and 2007. The purpose was to assess the potential impacts of the establishment of the EMFTA, which was proposed for implementation by 2010. The SIA examined economic, social and environmental impacts of the anticipated EMFTA through various scenarios associated with liberalization of trade related to industry, agriculture and services. Biodiversity was one of the aggregate indicators used to assess the potential environmental impacts of the free trade zone on the EU and on Mediterranean Partner Countries (MPCs, e.g., Southern Mediterranean Countries). The other environmental indicators were on environmental quality (e.g., air/water pollution, solid waste and climate change) and natural resources. Indicators were identified through a consultative process with regional stakeholders.

Biodiversity was also proposed as one of the key indicators to be included in a proposed post-assessment monitoring mechanism, based on indicators adopted in the Mediterranean Strategy for Sustainable Development (MSSD). Two specifically were identified, namely MSSD indicator 16 on loss of arable land by desertification and MSSD 26 related to surface protection of coastal and marine areas.

ESCWA, in cooperation with the LAS and UNEP/ROWA, for 2010- 2011, is responsible for regional preparations for CSD cycles (Commission on Sustainable Development), and more specifically CSD-20 and CSD-21 addressing biological diversity and biotechnology topics.

On the other hand, The UNDP supported a project to the Ministry of Economy & Trade (MOET) which started in April 2001 with a dual funding from the World Bank and UNDP. The World Bank funding expired in July/August 2003 and since then the project is co-funded through the Lebanese Government and UNDP budgets (90% & 10% respectively), the project was extended recently till the end of 2010. The project implemented in 2005 the sustainability Impact Assessment with the aim of assessing the social, economic and environmental impact of the Association Agreement with the EU on selected sectors – namely the olive oil sector.
The project provided the draft Law for animal Quarantine that was sent to Council of Ministers in the 4th quarter of 2003 and the Law on Plant Quarantine that was ratified by the Parliament in November 2006. Moreover, the project provides the necessary facilitation to prepare Lebanon to access the WTO, the latter contributes to the protection and preservation of the environment through its objective of trade openness. Thus, once Lebanon will join the WTO it will integrate environmental considerations into the economy and trade sectors. However, at present the MoET/UNDP project is not mainstreaming biodiversity issues.

h) Water & Energy:

h.1) Ten Years Water National Action Plan (2000-2009)

Lebanon recently initiated a reform process that relies on private sector participation and includes a 10-year national strategy to meet water demand by building a series of dams and lakes to store surplus winter water, the promotion of drinking and irrigation water projects, and confrontation of wastewater and water quality problems (MEW, 1999; Comair, 2005). However, this official strategy makes no mention of plans to secure legal rights for all Lebanese to access sufficient and clean water. The strategy, which was approved by decision of Council of Ministers in 1999, mentions the need to conserve cleaner environments in terms of water and waste water but does not refer specifically to natural resources management nor to the conservation of biodiversity.

h.2) Energy:

At national level, no strategy or action plan relevant to energy was prepared. However, various plans addressing electricity sector were developed successively by the Ministry of Energy and Water (MEW). The Lebanese Center for Energy Conservation (LCEC) supports the MEW and the government with all issues related to energy efficiency and renewable energy (EE and RE). Accordingly, LCEC is in the process of developing a national EE and RE plan that can be included in any overall plan that could be developed later.

i) Tourism:

The Ministry of Tourism (MoT) is the main government agency responsible for tourism regulation and development. Guided by the World Tourism Organisation (WTO) and with support from the French Government and the United Nations Development Programme, the Ministry of Tourism has elaborated in 1996 a Master Plan for Reconstruction and Tourism Development in Lebanon. The Plan entitled “Tourism: A Future for Lebanon”, amplifies the principles of sustainable development, but did not specifically highlight the relation of tourism to biodiversity.

Even if conservation of biodiversity is not specifically mentioned in the strategy of the MOT, its involvement in supporting ecotourism as well as its partnership with MOE, have benefitted in the conservation of natural ressources and biodiversity.

On the other hand, in 2000, the Ministry of Environment (MoE) has developed, in collaboration with UNEP as part of the coordinating unit for the Mediterranean Action Plan, a “National Action Plan and strategy framework for sustainable tourism development in Lebanon”. This Action plan accounts for the need to consider the negative impact of mass tourism on natural ressources and the potential contribution of sustainable practices in tourism with respect to carrying capacity of natural ecosystems and natural ressources.

The Ministry of Environment integrates the issue of ecotourism within its different activities and projects with the civil society and NGOs including its small grant program which aims at providing financial support for local NGOs to implement different environmental projects based on priority areas identified by MoE one of which is ecotourism. This contributes to the implementation of the strategy framework for sustainable tourism prepared by MOE in 2000, which recommended the importance of enhancing the role of civil society in promoting ecotourism and awareness.

Collaboration between the Ministry of Environment and the Ministry of Tourism is being done in relation to ecotourism. On the occasion of the International Year on Ecotourism in 2002, several activities were executed in collaboration between MoT, MoE, UNDP, eco-tour operators and other concerned institutions to promote ecotourism concept in Lebanon. The campaign included a national workshop on ecotourism, exhibitions, field visits for donors and international institutions to natural sites including ecotourism activities in order to

mainstream ecotourism among international donors and projects, as well as other dispersed activities promoting ecotourism.

As a result of the campaign mentioned above, and since no legal status of ecotour operators is available in Lebanon even though many small tour outfitters adopting ecotourism as main area of activity are operating in Lebanon, the MoT started in collaboration of MoE and these tour operators to develop a draft legislation for ecotour operators to grant them legal official status and to regulate environmentally oriented activities including outdoors sporting and ecotourism, but to date, no such legislation is issued. However, the MoT has drafted a law concerned with alternative lodging.

i.1) Ecotourism/Specialty Tour Operators (Outfitted Trips)

At level of private sector and NGOs, many small tour outfitters in Lebanon cater to the outdoor adventure and historical/cultural travel market, although, no legal status of ecotour operators is available in Lebanon. Several of these tour operators are embracing the ecotourism ethos. The number of eco-tour operators has increased during the last past years in Lebanon, offering trips that will allow exploring the country's natural beauty and World Heritage Sites on foot, bicycle, and raft while leaving a minimal ecological footprint. Additionally, by arranging for small groups to stay in ecolodges, as well as hotels and campsites, visitors get the chance to interact with biodiversity and local cultures; and local communities get the opportunity to directly benefit from tourism. Small outfitters offer visitors the chance to custom tailor their trips and activities (from high-intensity trekking and mountain climbing, to low intensity hikes and cycling, to educational homestays with local families). They are also flexible in terms of the length of trips and offering different packages for different budgets. All activities promote nature sites and the biodiversity that it harbors and responsible tourism.

The need to coordinate with the private sector has been listed as prime recommendation of the strategy framework of MoE and accordingly a series of activities were initiated and implemented with objective to promote ecotourism. As examples to such cooperation between the public and private sectors are the eco guide training program implemented by MoE/UNDP through the MedWetCoast project, the diyafa program, the creation of destination Lebanon website and tourism package with SRI, the support of Souk el Tayyeb, the Lebanese Mountain trail, etc…

The Ministry of Environment and UNDP have prepared the environmental guidelines for Hotels and the environmental audit manual for hotels. Although those manuals are not mandatory, the Ministry of tourism has adopted them and is encouraging the hotels to abide by their recommendations.

j) Communication:

Coverage of environmental news and issues in the media has increased in recent years. Most environmental and biodiversity issues involve complex scientific arguments and conflicting points of view. However, to make exciting and accessible news stories, the media often presents these issues in simple black-and-white or 'good-versus-bad' terms, involving dramatic statements and images.

Most of Lebanon's leading newspapers introduced each a daily page for environment and heritage issues. However, the subjects are not frequently related to biodiversity and often deal with hot and social topics, preferably with political implications.

The weekly newspapers also address human rights, education and environment issues. A monthly magazine "Environment and Development" that started issuing in March 1997 is

concerned with environmental news and sustainable development at the global, regional and local level and is the first of its kind in the Arab world.

One of the most communication powerful sources of information for biodiversity, environment and others in Lebanon is the internet which permeates our media environment. Information about environment and biodiversity are available on the websites of most of the institutions dealing with environmental issues starting from the Ministry of Environment, academic and research institutions, local NGOs, international organizations working in Lebanon and others. More specifically, the Ministry of Environment has established in 2005 a biodiversity and a biosafety Clearing-House which are specific WebPages related to biodiversity and biosafety under the Ministry's website and which were established based on the requirements of the CBD.

Environmental priorities are progressively taking the lead in several daily issues and politics has also been lately tagged in green by the establishment of the Green Party in 2008. Same observations apply to the economic sector as more and more banks and insurance companies build their promotional campaign on their "green" performance. Nevertheless, biodiversity is still a relatively timid component of this type of communication as shocking topics such as pollution, degradation, and corruption are still taking the lead.

k) Education:

The Ministry of Education and the Ministry of Culture and Upper Education are the government institutions responsible for education in Lebanon. The "Centre du Development et du Recherche Pedagogique (CDRP)" is the main national body responsible to prepare studies and formulate the educational framework and scholaristic programs. It is directly linked to the Ministry of Education. Non-Government actors include NGOs, CBOs, and others in the private sector In addition to UNDP, UNICEF, and UNESCO collaborate with bilateral donors and through projects in some cases.

An "*Environmental Education Study*" in Lebanon has been prepared in 1998 by the Centre du Development et du Recherche Pedagogique (CDRP)" /Ministry of Education in collaboration with the Ministry of Environment, UNDP, UNICEF, UNESCO and WHO. This study identifies ways of integrating environment at the different levels of education (primary, intermediate and secondary). The study stresses the incorporation of environmental issues into all courses, rather than teaching separate environment courses. It mainly aims at helping each citizen acquire values related to the respect of natural ressources of Lebanon and its natural environment. Based on this study, the environmental concepts were integrated in the schools' curriculum through the notification No. 73/98 dated 23/11/1998 issued by the Minister of Education.

Such a reform of the educational programme in Lebanon, shifting from including ecology in sciences courses according to the curricula issued in 1964 to effective mainstreaming of environmental education within the school curricula into the various disciplines, have resulted in the increase of extra curricular activities within environmental clubs, especially in public schools for example.

The Ministry of Education, Ministry of Environment, UNESCO, UNDP and NGOs are coordinating efforts to encourage extra curricular activities oriented to environmental priorities, such as contests, trainings sessions, etc.…

Moreover, education programmes are being carried out in Lebanon also through different initiatives executed by several non-profit, non-governmental organizations NGOs dealing with environmental education and nature conservation. They execute several activities in schools, related to environmental issues including the establishment of Environment Information Centers and the opening of Environmental Clubs in Lebanese schools. Some of these activities were executed with financial support from MoE.

3.4. Other National Plans, Policies and Programmes related to main sectors:

1-Impact Assessments:

Environmental Impact Assessment (EIA)

The EIA concept was endorsed through the Law for the Protection of the Environment (no 444/02) which set in article 4 many environmental principles one of which is the EIA principle; the law states that this principle should be used as a planning and management tool for preventing pollution and minimizing degradation of natural resources. Impact Assessment was addressed in particular through articles 21, 22 and 23 of the law:

The law stipulates that concerned institutions, both in public and private sectors should carry out Initial Environment Evaluation (IEE) or EIA studies to projects likely to threaten the environment due to their extent, nature, impact or activities which cover all projects dealing with construction or other infrastructure, all activities affecting the natural environment through extraction or dumping of natural resources, or any proposed program, study, investment, or management that might affect a whole Lebanese area or a certain sector. The projects that need EIA also include any change, addition, expansion, rehabilitation or closure of any activities mentioned above. The MoE undertakes the review of studies and consequently provides its approval after verification of their compliance with environmental safety conditions and sustainability of natural resources.

Based on the law 444, a draft EIA decree was prepared by the Ministry of Environment and submitted to the Council of Ministers for endorsement. The draft EIA decree includes details related to various steps of EIA system (screening, scoping, review and monitoring). The draft decree states that all major development, infrastructure and industrial projects will have to undergo an EIA study to evaluate their impacts, in order to promote conservation activities and sustainability of natural resources before receiving approval. The EIA draft decree has listed in its annexes - related to the content of impact assessments studies- biodiversity as one of the component to be addressed in the EIA study.

Despite that the decree was not endorsed yet, EIA studies are being already requested for main projects prior to their execution based on law 444 and submitted to MoE. These studies identify potential impacts of relevant projects on the various environmental components including their effects on biodiversity. The MoE reviews the EIAs studies and provides its approval on the related projects after verification of their compliance with environmental standards.

Strategic Environment Assessment (SEA)

Over the period 2002- 2005, the Ministry of Environment started the implementation of the SEA project funded by EC-life third countries and managed by UNDP; aiming at mainstreaming environmental considerations into sectoral plans and programmes. Based on the law for the protection of Environment (law 444/02) the project prepared a draft decree for the implementation of SEA at national level and submitted it to the Council of Ministers for approval. The annexes of the draft SEA decree specified the content of the SEAs studies that have to be carriet out, and have listed biodiversity as one of the component to be addressed in the SEA studies.

SEA being a tool to mainstream environmental sustainability in public planning and decision making, the implementation of the related draft decree, once issued, would de facto lead to the mainstreaming of biodiversity considerations into plans, programmes and policies thus leading to the minimization of their adverse impacts on biodiversity including habitats loss and land use change and promoting accordingly the conservation and sustainable use of biodiversity.

Moreover, based on the need for integrating biodiversity components into impact assessment processes, the MoE developed in 2005 practical guidelines, in the form of a manual, for the integration of biodiversity considerations into SEA and EIA.

It is worth here to mention, that despite that the SEA decree is not endorsed yet, the Ministry of Environment started since 2005 to request officially SEA studies for plans and programmes. Through these SEA studies, impacts of related plans and programmes on all environment components including biodiversity are addressed which lead to the minimizing of negative impacts on biodiversity from unsustainable consumption of natural resources.

2-Action Plans to Combat Desertification:

Lebanon developed its National Action Plan (NAP) for the UNCCD in february 2003 during a participatory process including all relevant and active stakeholders representing all sectors, public, private, civil society and academia. The NAP was developed through a project executed by the Ministry of Agriculture and supported by the German Technical Cooperation (GTZ) and the Drylands Development Centre of the United Nations Development Programme.

The NAP has established the current state of desertification and land degradation in Lebanon, and has formulated mitigation measures, and has identified gaps in legislation.

Throughout the process, the conservation of biodiversity has been one of the major axis for the development of the action plan. The need to respect the carrying capacity of natural ecosystems is clearly accounted for in chapter 5 of the NAP in terms of natural resources with special focus on the pressure resulting from over exploitation and the consequences in terms of land degradation and desertification; chapter 6 of the NAP recognizes the role of vegetation cover and vegetation type in combating desertification and chapter 7 places the importance of conserving biodiversity as one of the mail lines of action leading to reducing desertification; finally appendix IV is dedicated to listing previous, ongoing and planned activities aiming at conservation of natural ressources in Lebanon as follows:

- National Biodiversity Strategy and Action Plan (NBSAP) (1998)
- Strengthening of National Capacity and Grassroots In Situ for Sustainable Biodiversity Protection (Protected Areas) (1996)
- Conservation of Wetlands and Coastal zones in the Mediterranean (2002)
- National Biodiversity Country Study (1997)
- Biodiversity Enabling Activity (Phase I) (1998)
- Biodiversity Enabling Activity (Phase II) (2003)
- Med Wet Coast (2002)
- Biodiversity Top – Up Enabling Activity Project (2002)

Within the framework of the NAP, four Local Action Programmes (LAPs) were elaborated in four different areas of Lebanon that were previously considered as homogeneous areas with respect to a combination of criteria such as the topography, the agricultural aspect, the communication means between the population zones, the marketing and human transaction, the zone dimension and the development master plan of the zones. The aim of the LAPs is to measure the human resources needs, to determine the desertification causes thus defining the necessary interventions to be later developed as bankable proposals.

However, the LAPs as developed to date, did not focus on biodiversity issues nor on the conservation of natural ressources.

In 2006, the National Action Plan for combating desertification was ready to be submitted to Council of Ministers for governmental endorsement, it has been translated to Arabic but the overall prevailing socio economic situation in the country since then, has delayed this procedure and the NAP is not yet submitted to Council of Ministers.

3-National Master Plan for Quarries:

A National Master Plan for Quarries was issued in 2009 as part of the decree No.1753 dated 23/4/2009 (latest amendments of the decree No.8803 dated 4/10/2002 related to the organization of the operations of quarries & crushers in Lebanon). The decree states that each application for quarries license must include –among other documents- a preliminary study that identifies the impact of the quarry on the surrounding environment but did not specifies the biodiversity component, in addition the study must includes the measures that will be taken for the rehabilitation of the site progressively during the extraction works and after their end.

The decree also states that rehabilitation must be done to the site after the extraction works which include remediation of the extraction sites and soil preparation for agriculture and forestry purposes.

In Lebanon, A National Council for Quarries is established to decide on granting the licenses for the operations of the quarries. The National Council for Quarries is headed by the Minister of Environment and includes representatives from eight other concerned government institutions.

The MoE/National Council for Quarries undertake the review of the license applications and its related documents and studies required by the decree No.1753 dated 23/4/2009 mentioned above and verify its compliance with the environmental standards and criteria, and propose accordingly to the Minister of Environment either the approval or rejection of the application's license. Finally, the Minister of Environment takes the final decision and sends it to the Governor who is the authority responsible for issuing the quarries license.

4- National Action Plan for Solid Waste Management in Lebanon:

The National Action Plan for Municipal Solid Waste Management in Lebanon was prepared by the Council of Development and Reconstruction (CDR) in cooperation with the Ministry of Environment (MoE) and approved by the Council of Ministers through its decision No.1 dated 28/6/2006. The Action Plan specifies the suitable locations for the establishment of solid waste management facilities (sorting, composting and landfilling). According to the official request of the Ministry of Environment about the necessity to conduct EIAs and SEAs studies for the suggested sites and proposed technologies prior to the execution, these sites were subject to environmental impact assessments studies in 2008 to evaluate their impact on the different environment components including their effects on the biodiversity. The MoE has reviewed theses studies and accordingly provided its comments and recommendations to ensure that the projects will comply with environmental standards and sustainability of nature resources.

5- Millennium Development Goals:

Since 2007, the Ministry of Environment and UNDP have worked on finalizing a draft report on environmental sustainability in Lebanon (MDG goal 7). Nevertheless, to date, this report has not been processed through official channels and no national plan or strategy related to the MDG has been adopted for Lebanon.

The draft report states that since the previous report published in 2003, and despite the serious challenges facing Lebanon, progress in environmental sustainability aspects has been observed over the last few years. In early 2006, Lebanon ranked 36 out of 133 countries and came in first within the Arab region on the Environmental Performance Index (EPI). Moreover, the Ministry of Environment has continued to push the environmental agenda to the forefront of the government's programme to ensure that Lebanon's environmental resources are maintained and remain in line with international conventions that Lebanon continues to ratify and meet. However, the July/August 2006 Israeli war on Lebanon resulted in a heavy environmental degradation equivalent to an average cost of 729 million dollars, which is equal to 3.6% of GDP. (Source: World Bank)

The draft report (MDG 7) has highlighted the specific challenges faced by biodiversity in Lebanon especially those related to habitat fragmentation, forest fires, pollution and oil spill (july 2006), lack of environmental monitoring and baseline data in specific sectors (such as marine and fresh water biodiversity), lack of comprehensive environmental strategy to be mainstreamed across different ministries and sectors, overlapping mandates of public institutions, limited public budget, lack of environmental law enforcement and lack of integrated water resource management approach.

Accordingly, the report has listed a series of recommendations and has suggested some key indicators to be adopted for future monitoring of biodiversity priorities. Those indicators include:

- Total forest coverage
- Total area under protection (protected area network)
- Number of threatened species

3.5- Other Conventions besides the CBD:

1- United Nations Framework to Combat Climate Change:

Lebanon ratified the UNFCCC in 1994 (Law 359 dated 1/8/94) and committed itself to develop and regularly update GHG Inventory and to formulate, implement and regularly update national and regional programs containing measures to mitigate Climate Change.

Article 12-5 of the UNFCCC stipulates that all parties to prepare their national communications on climate change, which includes the assessment of the vulnerability of the country to the adverse effects of climate change and to propose adaptation measures to the most vulnerable sectors (Decision 17/CP.8, Part IV), Lebanon, has already prepared in 1999 its Initial National communication where the vulnerability of terrestrial ecosystems, natural habitat, wildlife and coastal systems were studied and relevant adaptation measures proposed. Mitigation measures were also proposed for the conservation of forests, as they are the main carbon stock/sink of national GHG emissions. Through this process, biodiversity issues were indirectly linked to climate change impacts, specifically when forests and marine and terrestrial ecosystems were taken into account in the report.

No national plan or strategy was established in relation to climate change in Lebanon, however independent projects were launched at the MoE and other public and governmental institutions that tackle different vulnerable sectors to climate change taking as baseline the findings of the initial national communication..

The project "Enabling Activities for the Preparation of the Second National Communication (SNC) to the United Nations Framework Convention on Climate Change (UNFCCC)" executed by MoE and implemented by UNDP through GEF funds since 2007 till 2010, aims at assisting Lebanon with the enabling activities necessary to undertake the Second National Greenhouse Gas Inventory and to prepare and report the Second National Communication

to the Conference of Parties in accordance with guidance of the UN Framework Convention on Climate Change (UNFCCC). In addition, this project will help strengthen Lebanon's capacity to fulfill its commitments to the UNFCCC on a continuing basis. The structure of this project is based on the country's previous experience and studies already identified under a stocktaking exercise. The main components of the project are: (a) an inventory of greenhouse gases for the year 2000 and time series 1994-2000; (b) an update of analysis of potential measures to mitigate the increase in greenhouse gas emissions in Lebanon; (c) an assessment of potential impacts of climate change in Lebanon and adaptation measures; (d) preparation of the Second National Communication of Lebanon and submission to the COP. In addition, public awareness activities and stakeholder consultations will be cross-cutting along the overall course of this project. Therefore, the preparation of the Second National Communication is expected to enhance general awareness and knowledge on climate change-related issues in Lebanon, and to help into highly taking them into account in the process of national planning and policy.

At a later stage, Kyoto protocol introduced the CDM (Clean Development Mechanism) process, where afforestation and reforestation were considered as a mean to reduce GHG emissions. However, due to the weakness of the related methodologies, the issue was presented in Montreal COP 11 in 2005 where the parties established a 2-year process to explore how deforestation in developing countries could be integrated into the climate process and was later discussed in Bali COP 13 in 2007 where parties agreed to include sustainable management of forests, forest degradation and deforestation in post-2012 climate agreements and further develop the mechanism for Reducing Emissions from Deforestation and Degradation (REDD).

The Ministry of Environment in Lebanon has been designated as the National authority entitled to revise and accept projects related to Clean Development Mechanism (CDM). Clean Development Mechanism projects include carbon sequestration projects, where two types of carbon sequestration projects are eligible under CDM: afforestation and reforestation projects. In Lebanon, the eligibility of a site for A&R projects, depends on the existing tree cover and is applicable if: (1) tree crown cover is less than 0.5 ha, or if tree height at maturity is less than 2.5 m, and tree density on is at minimum tree at 15 %; or (2) Both, the tree crown cover and the tree height at maturity are less than the adopted threshold values. Lebanon is in process of considering potential reforestation and afforestation projects under the CDM that comply with the above mentioned criteria.

On the other hand, a report was recently finalized in April 2009 about the "National Overview on Vulnerability and Impacts of Climate change on Marine and Coastal Biodiversity in Lebanon" prepared under MAP/RAC-SPA. The report highlighted the expected impact of climate change on marine biodiversity based on the assessment of available information about climate change impacts in Lebanon and has proposed a series of priority actions to be developed, one of which is an "Oceanographic Observations– Climate Change" action.

2- United Nations Convention to Combat Desertification:

Since the ratification of UNCCD by the Lebanese Parliament, The Ministry of Agriculture in its capacity as the focal institution has prepared three national reports (2000, 2002 and 2006) on the progress in the implementation of the Convention.

Main achievements in Lebanon to fulfill the requirements of the UNCCD are the desertification National Action Plan (NAP) and the four Local Action Plans (LAP) mentioned in the section III-2 above, which were developed through a project executed by the Ministry of Agriculture and supported by the German Technical Cooperation (GTZ) and the Drylands Development Centre of the United Nations Development Programme. The extent of mainstreaming biodiversity considerations into the NAP and LAPs are highlighted in the section III-2 of this chapter.

The MOA as focal point for the UNCCD in Lebanon has developed in 2007 a financing strategy to implement the NAP. Starting November 2008, the MOA has initiated the implementation of this financing strategy by identifying various funding means either internal (from its own budget) or external (fund raising and project development) or innovative (debt swap, CDM, carbon trade etc…).

On the other hand, the MoA has executed since 2006 two projects on flood control and management (the first one in 2006 in collaboration with GTZ and ACSAD and the second one in 2008 in collaboration with UNDP and funds from the Spanish government through the Lebanese Recovery Fund) in order to reduce the damages of flood on downstream villages in North Bekaa area which is an area threatened by heavy floods following torrential rains in the Anti-Lebanon mountains. These flash floods lead to severe soil erosion in addition to substantial agricultural damage and destruction of several aqua farms and their contributing causes are: absence of proper land management, uncontrolled grazing practices, and high land degradation. These factors are, not only contributing to the problem of flash floods, but also leading to a high risk of rapid desertification in the area.

The GTZ project handled in Al'Qaa region a watershed area of 18 km^2 and established check dams, contour bunds and stone walls in addition to 3 collection lakes ranging between 20,000-40,000 cu. meters in volume. The UNDP project on "Flood Risks Management" aims at supporting early recovery efforts in Baalback-Hermel region through the implementation of a flood risk management plan. The plan is based on the construction of stone walls, check dams and water collection reservoirs to prevent runoff water from reaching villages and farms and through the restoration of land cover to reduce soil erosion. The project includes two phases, the first phase initiated in 2008 targets a watershed of 94 km^2 that affects primarily the villages of Aarsal and Fakha and a second phase launched in 2009 for a 200 km^2 watershed that affects the village of Ras Baalback.

All the above mentioned projects aiming at reducing the damages of the flood on the mentioned targeted downstream villages will help also to reduce soil erosion, increase water infiltration towards ground water aquifers, increase soil humidity and regeneration of vegetation cover. In addition the phase I of the UNDP project will initiate in October 2009 in collaboration with local communities the plantation of 25 000 plants of wild native plants including wild pear, wild almond and wild plum as well as Juniperus and Cratageus.

In Lebanon, the combat desertification approach has been adopted in various projects and development programmes to guarantee the sustainability of the actions of the NAP.

The country profile is very crucial in the assessment of progress made in the improvement of natural resources management and runs a risk of not capturing important development taking place at local levels. That could be a major constraint. However, the country still needs capacity building on data reporting and storage as well as the necessary tools and instruments for data collection, analysis and reporting.

As drylands are priority habitats in Lebanon, efforts are being exerted to address the issue of the degradation of dry and sub humid lands through the United Nations Convention to Combat Desertification (UNCCD) and Climate Change and to mainstream prevention of land degradation into development processes.

3- World Heritage Convention:

Lebanon ratified the World Heritage Convention (WHC) on February 3, 1983 and has since then 5 sites were inscribed on the World Heritage List: four cultural sites (Anjar, Baalbek, Byblos, and Tyre) and one site classified as cultural landscape, which actually include two sites under one nomination: Qadisha Valley (the Holy Valley) and the Forest of the Cedars of God (Horsh Arz el Rab).

The conservation and sustainable management of the latter two sites cover de facto the conservation and sustainable use of terrestrial and forest biodiversity since they have natural properties and harbor important plant species: Qadisha Valley is known for its floaral richness and variety and the Cedars of God site harbor the famous Cedars of Lebanon *Cedar Libani* .

The Directorate General of Antiquities/Ministry of Culture is the focal point of the WHC regarding the Cultural sites and the Ministry of Environment regarding the Natural sites. Regarding the sites classified under the WHC as "Cultural Landscape", both Ministries collaborate together in the issues related to this type of nomination.

4- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

Lebanon is not a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) which aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival. Through its three appendices, the Convention accords varying degrees of protection to more than 30,000 plant and animal species.

Nevertheless, and even though Lebanon is non party yet to the CITES, the Ministry of Agriculture/Directorate of Animal Resources which is the authority responsible of the supervision of the veterinarian health of the animals exported and imported in Lebanon, is also granting permits for the export/import of animal species listed in Annex1 of CITES, these permits known as "CITES permits" are given after consultation with a scientific committee.

However, the CITES regulations are not fully enforced while issuing the CITES permits.

5- RAMSAR Convention

Lebanon has ratified Ramsar Convention on August 1999 and actually hosts four RAMSAR sites: Palm Islands Nature Reserve, Ammiq Wetland, Tyre Beach nature Reserve and Ras el Cheqa'a.

Since the RAMSAR sites harbor significant biodiversity species specially migratory birds species, the management of these sites as per RAMSAR Convention requirements will lead de facto to the conservation and sustainable use of biodiversity, specially that two of these sites are nature reserves managed according to CBD *in-situ* conservation provisions and have specific management plans, in addition Ammiq wetlands is a private property managed by an NGO but was managed in collaboration with the Ministry of Environment and its management plan was developed in full partnership and collaboration with the Ministry within the context of the "MedWET Coast project".

The Ecosystem approach:

The Ecosystem Approach is considered as one of the most important principles of sustainable environmental management. The Fifth Conference of the Parties to the Convention on Biological Diversity defined the Ecosystem Approach in Decision V/6, Annex A, section 1 as 'a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way'. Essentially it requires taking into consideration the effects of actions on every element of an ecosystem, based on the recognition that all elements of an ecosystem are linked.

As described by the Conference of the Parties, the ecosystem approach is the primary framework for action under the Convention. The Conference of the Parties, at its Fifth Meeting, endorsed the description of the ecosystem approach and operational guidance and recommended the application of the principles and other guidance on the Ecosystem Approach (decision V/6). The seventh meeting of the Conference of the Parties agreed that the priority at this time should be on facilitating implementation of the ecosystem approach and welcomed additional guidelines to this effect (decision VII/11).

In Lebanon, the ecosystem approach was adopted in Nature Reserve management especially in 2007 at Tyre Beach Nature Reserve and in 2008 at Palm Islands Nature Reserve where the two reserves developed each an ecological monitoring manual focusing on a holistic ecosystem approach based on the interaction between different species and their habitat in terms of biological and physical parameters.

In 2009, another manual using the principle of ecosystem approach is currently under development at the Shouf Biosphere reserve. Similarly, the recent management plan developed for Tannourine Cedar Forest Nature Reserve in 2008, adopted in its implementation plan the principles of ecosystem approach by recommending actions and activities accounting for all the elements of the ecosystem simultaneously. Comparable initiatives related to grazing management have been attempted in the Shouf Biosphere reserve.

At research level, although the ecosystem approach is prone for and recommended, it is seldom practical to effectively put in into practice since it requires a good level of inter-disciplinarity and coordination among scientists and experts from the various fields. Therefore, examples of implementation and adoption of the ecosystem approach are restricted to nature reserve management or experimental scientific projects as the multidisciplinary team is already part of the approach.

3.6. Conclusion

The overview provided by this chapter about biodiversity mainstreaming into relevant sectoral and cross-sectoral plans, programmes and policies besides the environment, indicates that some have addressed directly biodiversity considerations such as the "National Reforestation Plan", the "Hunting Law", the "Strategy for Agricultural Development in Lebanon", the "National Master Plan for land Management in Lebanon (SDATTL)" and the "Desertification National Action Plan" and in these cases the major challenge remains the proper enforcement of the requirements of these policies and plans.

In the majority of the cases, environmental considerations were integrated in the main sectors or into their related plans and strategies but without referring specifically and directly to biodiversity components such as the "National Master Plan for Quarries" and the "National Strategy for Forest Fires" and the following sectors: Tourism, Education, Communication, Economy and Trade, Fisheries and Industry.

Some sectors didn't address even considerably the environment component such as the Water and Energy sectors and the "National Action Plan for Solid Waste Management in Lebanon" however the locations defined in the latter for the establishment of solid waste management facilities were subject to impact assessment studies before their establishment thus covering biodiversity components among other environmental components.

On the other hand, mainstreaming biodiversity considerations is achieved within the context of some projects such as on "Mainstreaming Biodiversity Management Considerations into Medicinal and Aromatic Plants Production Processes" and the "Agrobiodiversity project".

The findings of Chapter 3 reveal that there is a major progress in Lebanon in mainstreaming environment into other sectoral plans and programmes but the biodiversity component is not tackled in particular, therefore biodiversity considerations need to be integrated more directly and specifically into the relevant related sectors and the sectoral and cross-sectoral plans, policies and strategies. Nevertheless some of the plans have addressed the biodiversity components, and others which have integrated environmental considerations and not specifically biodiversity, cover though natural resources and biodiversity among other environmental components thus contributing indirectly to biodiversity mainstreaming. In the cases of the closely related plans, strategies and programmes, even if it did not refer in particular to biodiversity considerations such as "The Forest Fires National Strategy" or did not integrate explicitly the CBD provisions such as the biodiversity related Conventions and Agreements, their implementation contribute definitely to the conservation of biodiversity and their sustainable use.

Chapter IV

Conclusions

Progress Towards the 2010 Target
And
Implementation of the Strategic Plan

Chapter IV draws upon the information in the first three chapters of the report to analyse how national actions taken to implement the Convention and the NBSAP are contributing to achievement of the 2010 target and relevant goals and objectives of the Strategic Plan for the Convention adopted in COP decision VI/26 issued in 2002 in which Parties committed themselves **to achieve, by 2010, a significant reduction in the rate of biodiversity loss at the global, national and regional levels, as a contribution to poverty alleviation and to the benefit of all life on earth,** and the provisional framework for goals and targets adopted in COP decision VII/30 in 2004 to enhance the evaluation of achievements and progress in the implementation of the Strategic Plan.

According to the guidelines from the CBD Secretariat, Chapter IV is divided into three sections:

1. Section A. Progress towards the 2010 Target: An assessment of progress towards the 2010 target at the national level will be done using the CBD framework for goals and targets.

2. Section B. Progress towards the Goals and Objectives of the Strategic Plan of the Convention by assessing progress in meeting, or contributing to, the relevant goals and objectives of the Strategic Plan.

3. Section C. Conclusions: An overall assessment of whether implementation of the Convention has had an impact on improving conservation and sustainable use of biodiversity, and the fair and equitable sharing of benefits arising out of the utilization of genetic resources in their country. An analysis of lessons learned regarding implementation, a summary of future priorities and capacity-building needs, and suggestions for actions that need to be taken at the regional and global levels to further enhance implementation of the Convention are also requested.

4.1. Section A: Progress Towards the 2010 Target

As mentioned in the chapter 2, Lebanon has prepared its National Biodiversity Strategy and Action Plan (NBSAP) in 1998 in which national goals and objectives were set and actions to achieve these targets at national level were defined.

In response to the more recent obligations related to the 2010 biodiversity target namely the Strategic Plan for the Convention adopted by the COP in 2002 and the provisional framework for goals and targets adopted in 2004 to enhance the evaluation of achievements and progress in the implementation of the Strategic Plan,

Lebanon has initiated in 2005 a review of its NBSAP and has issued accordingly a draft addendum to the National Biodiversity Strategy and Action Plan in which an alignment of the proposed actions of the 1998 NBSAP with the goals and targets of the provisional framework of the CBD mentioned above were done.

In decision VI/26 issued in 2002 the Conference of the Parties adopted the Strategic Plan for the Convention on Biological Diversity. In its mission statement, Parties committed themselves to a more effective and coherent implementation of the three objectives of the Convention,

to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth.

This target was subsequently endorsed by the World Summit on Sustainable Development. In decision VII/30 issued in 2004, the Conference of the Parties adopted a framework to facilitate the assessment of progress towards the 2010 target, and communication of this assessment and to promote coherence among the programmes of work of the Convention and to provide a flexible framework within which national and regional targets may be set, and indicators identified.

The framework includes seven focal areas, these are:

(a) **Reducing the rate of loss of the components of biodiversity** including: (i) biomes, habitats and ecosystems; (ii) species and populations; and (iii) genetic diversity;
(b) **Promoting sustainable use** of biodiversity;
(c) **Addressing the major threats** to biodiversity, including those arising from invasive alien species, climate change, pollution, and habitat change;
(d) **Maintaining ecosystem integrity**, and the provision of goods and services provided by biodiversity in ecosystems, in support of human well-being;
(e) **Protecting traditional knowledge**, innovations and practices;
(f) **Ensuring the fair and equitable sharing** of benefits arising out of the use of genetic resources; and
(g) **Mobilizing financial and technical resources**, especially for developing countries, in particular least developed countries and small island developing States among them, and countries with economies in transition, for implementing the Convention and the strategic Plan

For each above mentioned focal area, global goals and targets were established by the COP in the same decision VII/30 and were provided in the Annex II of the decision in a Provisional Framework for Goals and Targets, in order to clarify the 2010 global biodiversity target adopted by decision VI/26 and help assessment progress towards the target. Such goals complement the existing goals of the Strategic Plan.

The above mentioned focal areas defining the 2010 commitments have been addressed by the Lebanon 1998 NBSAP through its national goals, objectives and related proposed

actions, to various extent based on the country's identified priorities, constraints and national peculiarities.

COP7 emphasises in its decision VII/30 that the provisional framework of goals and targets should be viewed as a flexible framework within which national and/or regional targets may be developed, according to national priorities and capacities, and taking into account differences in diversity between countries, and invites Parties accordingly to develop national and or/regional goals and targets, and, as appropriate, to incorporate them into relevant plans, programmes and initiatives, including national biodiversity strategies and action plans, when these are revised.

Lebanon did not develop new national targets in accordance to the four goals of the Strategic Plan and the goals and targets of the provisional framework, but a revision of the NBSAP has been performed in 2005 to highlight Lebanon's efforts towards 2010 commitments through the Top-up Biodiversity Enabling Activity project funded by UNDP/GEF and executed by MoE with assistance of a group of scientists "IBSAR" from the AUB. This has resulted in the elaboration of a draft addendum to the Lebanon NBSAP within which Action Sheets have been developed for each proposed action of the 1998 NBSAP and consolidated within the 2010 defined focal areas, goals and targets of the CBD provisional framework for goals and targets whenever possible.

In the above mentioned sheets, indicators and monitoring activities have been proposed for all proposed national actions but Lebanon still needs to develop its own indicators and come up with a monitoring strategy that is sustainable and not limited within the period of the execution of a short term project funding. An example illustration the lack of resources that Lebanon is suffering from, is related to the LEDO project (Lebanese Environment and Development Observatory) which has developed in 2002 indicators in all environmental fields but did not progressed further following the termination of the project funds despite the participatory approach that was used to develop the indicators. On the other hand, guidelines for biodiversity indicators and project monitoring were developed in 2005 within the above mentioned Top-up Biodiversity Enabling Activity project. It is recommended that national indicators for assessing progress towards the 2010 biodiversity target and monitoring be developed within the context of LEDO and drawing on the above mentioned guidelines for developing biodiversity indicators and project monitoring.

To sum up, an alignment of the actions of the Lebanon NBSAP with the goals and targets of the provisional framework of the CBD were done and indicators were set for each of these national actions that are linked to the global goals and targets, but this did not include specifically the identification of national indicators for measuring progress towards the 2010 biodiversity target and related global goals and targets due to the obstacles and needs mentioned in the paragraph above, therefore no information will be reported on national indicators in this chapter.

An attempt to assess Lebanon progress towards the 2010 Target will be provided in the form of a table in which:

Column 1. The provisional framework of goals and targets from COP Decision VII/30

Column 2. Includes the actions proposed in the 1998 NBSAP, showing how these actions link to the respective CBD targets.

Column 3. The text in this column describe the outcomes of actions taken in Lebanon to implement the Convention at national level and the NBSAP and which have contributed to the achievement of the relevant global goal and target of the provisional framework where applicable. The information provided in this column will be based on key findings from previous chapters of this report.

Column 4. Obstacles and needs in achieving the related CBD target.

Table 1. Illustrative table showing how national actions of the 1998 NBSAP aligns with relevant global goals and targets of the provisional framework adopted in COP decision VII/30 and how actions taken at national level to implement the Convention and the NBSAP contribute to the achievement of relevant global goals and targets. The table was completed on the basis of available information from literature review and individual consultative meeting with the stakeholders.

Global goals and targets	***NBSAP actions related to the global target***	***Lebanon contribution to progress towards the global target***	***Obstacles and needs***
Protect the components of biodiversity			
Goal 1. Promote the conservation of the biological diversity of ecosystems, habitats and biomes			
Target 1.1: At least 10% of each of the world's ecological regions effectively conserved. **Target 1.2: Areas of particular importance to biodiversity protected**	Characterize and classify protected areas. (mapping, protection, rehabilitation updating inventories Establish natural reserves and marine parks representing major eco-geographical areas. Protection of remarkable natural habitats , characterized by their ecology. Establish in protected areas core zones (Biodiversity warehouses) and buffer zones with access to fire-fighters and restricted vehicles. Establish nature reserves on several sites representing the major eco-geographical areas of Lebanon, that have a wide diversity of naturally growing plants and animals, and with as many wild relatives of agricultural crops as possible.	Till present, the Ministry of Environment (MoE) has declared by law, seven locations as nature reserves. All of them cover about 1.8% of the Lebanese territory. In addition three biosphere reserves were declared recently and cover 3.82% of the Lebanese territory. In addition, 15 sites are declared in Lebanon as IBAs by BirdLife International thus increasing the number of IBAs from four in 1994 to 15 in 2009, the new additional 11 sites were declared in 2005-2008. The seven nature reserves are areas of particular importance to biodiversity and cover the following ecosystems: five forest mountainous ecosystems two of which are cedar forests, one island ecosystem and one coastal and marine. Two nature reserves are in process of declaration and continuous requests are submitted to the Ministry of Environment for the declaration of new sites. In addition to the nature reserves, the law of protection of forests and forest resources (Law 85 dated 7/9/1991), amended by the Parliament through the Law of forest protection (Law 558 dated 24/7/96) stipulates that all cedar, fir, juniper forests and "other coniferous forests" in Lebanon are protected de facto.) Sixteen forests	Lot of actions were done in Lebanon regarding protected areas but currently we are still behind the target for protected area coverage and representativity of ecosystems and habitats, but the quality of PAs and effectiveness of conservation compensate the low coverage of protected areas. The ownership status of most areas meriting protection and the lengthy period for the preparation and approval of nature reserves requests are considered the main obstacle at the present, however these issues are considered by the draft framework law for protected areas prepared by MoE and will be resolved once the law will be issued but the obstacle here consists in the lengthy process for the endorsement of the law.

Global goals and targets	*NBSAP actions related to the global target*	*Lebanon contribution to progress towards the global target*	*Obstacles and needs*
	Issue guidelines for the conservation of agrobiodiversity. Wetland conservation areas should be established. Protection and management of the ripisylves.	were declared protected explicitly by ministerial decisions issued by the Ministry of Agriculture under the law of forests protection However there is a need to a more effective management and monitoring of human activities or natural catastrophes within these protected forests. On the other hand, the MoE is continuously issuing ministerial decisions to classify important natural sites and landscapes, until present there are many ministerial decisions declaring valleys, mountain tops and mainly river mouths under the protection of the Ministry of Environment. However, these decisions need a mechanism for proper enforcement and monitoring. Other sites of cultural or natural importance are listed under the UNESCO world heritage such as the valley of Qannoubine called "the valley of Saints" which is classified as "Natural Landscape". More details on protected areas are provided in Appendix 3.	Only the nature reserves have proper management plans and the human activities and biodiversity conservation are well controlled within these reserves, there is a need to a more effective management and monitoring within the sites classified as protected forests and natural sites/landscapes. There is a need to establish new protected areas in new ecological regions like the semi arid places which are till today more or less neglected and in marine areas since only one marine nature reserve exist.

Global goals and targets	*NBSAP actions related to the global target*	*Lebanon contribution to progress towards the global target*	*Obstacles and needs*
Goal 2. Promote the conservation of species diversity			
Target 2.1: Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups. **Target 2.2: Status of threatened species improved.**	Rehabilitation of abandoned or degraded zones. Locate rehabilitation nurseries within the protected areas and use indigenous species Join efforts with municipalities and NGO's to use and conserve local germplasm. Expand fresh water fish farms to reduce pressure on natural habitats. Solving the Problem of overgrazing: identification and promotion of adequate fodder plants and pasture areas. Regulating hunting, including obligatory tests for acquiring necessary permits. Preventing and combating forest fires. Water sources polluters should be asked to reduce pollution, pay to rehabilitate or encouraged to alleviate pollution pressure. Help in establishing zoos and aquaria for endemic species.	Species diversity is being conserved mainly in the nature reserve through in-situ conservation. The seven nature reserves of Lebanon are areas of particular importance to biodiversity and include many endemic, rare, threatened and noteworthy species. In some nature reserves, the MoE is carrying out restoration activities of populations of species of selected taxonomic groups. This is the case of the Audouin's Gull threatened species which is subjected to restoration efforts at the Palm Islands Nature Reserve. At a global scale the IUCN Red Data Books identify species at high risk of global extinction. Considering the vulnerable, endangered and critically endangered categories, 14 bird species within the list occur in Lebanon. The law of hunting considers the protection of these species and doubles the penalties in case of law breach. The hunting law dedicates an entire chapter for the penalties on infractions to the hunting regulations. The IUCN red data lists encompass 11 species of trees that are present in Lebanon (most of them are coniferous trees that are protected by the forest law). Those species are however listed at low risk as per IUCN reference. Out of the 29 species of fish of Lebanon mentioned in the IUCN red data list, 1 is vulnerable, 3 are considered endangered and 2 are critically endangered. Concerning the mammals recorded in Lebanon, 2 species are near threatened species, 10 are already extinct and 12 are globally vulnerable. The programmes executed during the last past years (2007-2009) regarding prevention and fighting of forest fires mentioned in chapter 2 contribute to the reduction of species diversity decline in forest areas, knowing that the "National Strategy for Forest Fires" was endorsed by the Council of Ministers in May 2009	Lack of indicators to assess trends in species increase or decrease There are mainly actions for sites protection and restoration within which the conservation and restoration of species is integral part of the habitats protection, thus there is a need too for species restoration programmes. There is also a necessity to contribute to the implementation of the single threatened species action plans that are elaborated by the international conventions and agreements. Little legislation only exists regarding target species conservation outside nature reserves, and there is a need of proper enforcement of those legislations. The hunting law is not operational yet since it needs the elaboration of its implementation decrees. These decrees along

		and the future implementation of its activities will contribute also in this regards. The ban of grazing through the forest law (1949) within cut and burned forests encourage natural regeneration processes.	with the needed ministerial decisions under the hunting law are currently in process of preparation.
	Establish a data base system for fresh water richness and endangered species.	One success story of reduction of the decline of populations of species of selected taxonomic groups is the case-study of the Cedars of the Tannourine forest nature reserve which were threatened by the outburst of an insect "*Cephalcia tannourinensis".* In fact, the cedar forests of Lebanon are known for the importance of their great genetic diversity and for being the southernmost cedar populations. During the late 1960s, one of the largest of the remaining 12 cedar stands in Lebanon, the cedar forest of Tannourine, became severely infested by a new insect species, a sawfly, identified as *Cephalcia tannourinensis*. The situation was very severe, the whole stand was attacked and the possibility of the pest spreading to the surrounding forests, including the UNESCO World Heritage Site, the Forest of the Cedars of God (Horsh Arz el-Rab) at Bcharreh, was a real threat. The neighbouring countries of Cyprus, Syria and Turkey expressed justifiable concern about transboundary spread of the new insect pest. In 1990s, following the civil war, it was possible for the Rural Development and Natural Resources Directorate (RDNRD) of the Ministry of Agriculture to initiate a joint venture with the American University of Beirut and with experts from the "Institut National de la Recherche Agronomique" (INRA-France). This group was responsible for making the preliminary identification of the insect pest, for determining its life cycle and natural enemy complex and for making recommendations for immediate control noting the critical situation and for long-term management using pheromones (insect sex attractants). Spray operations with insect growth inhibitor were undertaken with assistance from the Lebanese Army. A technical Cooperation Project with the FAO provided the necessary assistance for further studies. The efforts made through studies and projects didn't only stop the decline of the Tannourine	Conservation of threatened species is mainly applied in the protected areas and there is a need for protection of threatened species outside the protected areas as well. Furthermore, there is a lack of national red lists of threatened species and lack of species action plans. Thus is a real pressing need to establish a National Red Data Book for Lebanon. This has been included in the National Action plan for protected areas in Lebanon prepared by MoE in 2006. Unfortunately, the majority of research is limited to the preparation of checklists whereas the study of trends is required to answer the target 2.2.

		Cedar but also improved its status especially with the implementation of the forest sustainable management plan and the integrated pest management plan. Following the efforts made by MoA and FAO, the MoE launched in 2004 a project on "Integrated management of Cedar forests in Lebanon in cooperation with other Mediterranean countries" financed by GEF, implemented by UNEP and executed by the American University of Beirut under the supervision of MoE. The project was implemented till 2007 and aimed at developing an action plan for integrated sustainable management of the Tannourine Cedar Forest Nature Reserve and to protect the threatened Cedar *Cedrus libani* from the invasive insect species *Cephalcia tannourinensis*.that are causing serious damage to the trees. This project proved to be successful in: -Developing a sustainable management plan that addresses possible threats to the ecosystem of forests and means of removal of these threats. -Understanding the causes of *Cephalcia* outbreak in Tannourine and assessing the possible threats of similar outbreaks in cedar forests in the Mediterranean region. - Developing a pest management plan applied to the Tannourine forest and adapt this plan to other cedar forests in the region through dissemination of knowledge and best practice. - Increasing institutional and community knowledge exchange, networking, education and capacity building for the management of cedar forests. Few target threatened, endangered and endemic species were protected through ministerial decisions issued by the Minister of Agriculture. This includes the ban of import of cedar trees and seeds, the regulation of harvesting of Oregano and Salvia, the ban of cutting and export of *Ferrula hermonensis* and the ban of fishing of marine turtles, cetaceans and monk seals and the selling, use or trade of any derivates from the mentioned species. Outside nature reserves, species restoration are limited to some projects and initiatives.	

		Some activities executed in Lebanon contribute to the conservation and rehabilitation of species: - Establishing a private rehabilitation centres for wild injured and orphan animals. - Establishing nurseries, ex-situ conservation centres and demonstration sites - Increasing awareness due to the recent establishment of a small marine museum, pet zoo, the production of awareness and educational materials and the conduction of capacity building and training workshops.	

Global goals and targets	***NBSAP actions related to the global target***	***Lebanon contribution to progress towards the global target***	***Obstacles and needs***
Goal 3. Promote the conservation of genetic diversity			
Target 3.1: Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained.	Establish traditional farms to maintain and propagate the traditional or "heritage" varieties or breeds that are being replaced by "modern" varieties.	Lebanon has contributed to the genetic conservation mainly through ex situ conservation. The major actors are the Lebanese Agricultural Research Institute LARI, and specifically its program to help safeguard valuable local livestock breeds and to preserve the genetic stock of local crop varieties, and the agro biodiversity project (chapter 2), but also local NGOs and academic institutions. Ex-situ conservation of genetic resources is done through: - Nurseries for specific species mainly *Origanum syriacum* ,*Salvia fruticosa*, grapes, almonds and figs. - Nurseries for native forest trees. - Nurseries for native trees of ornamental values, wild plants with medicinal value by academic institutions, namely the AUB. - Seed Banks for grapes and cereals. - International agreement between LARI, ICARDA and Royal Botanic Gardens Kew, for the establishment of a gene bank. - Biodiversity Seed Bank for Lebanon established by the American Universiy of Beirut (AUB) and located at the University's Agricultural Research and Education Center (AREC). Herbaria for the preservation of plant species (National Council for Scientific Research,	Indicators for monitoring genetic diversity have not yet been completed. Trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socio-economic importance are in need to be identified. Indicators of biodiversity used in food and medicine are under development) Trends in abundance and distribution of genetic resources are not yet developed.
	Establish at least one botanical garden for ex-situ conservation of perennial crops including cultivated trees, annuals and biennials.		
	Establish a central genebank, where the different aspects of ex-situ conservation are performed via 1) survey, collection and preservation of genetic resources; 2) evaluation and documentation of the collected material; and 3) breeding based on clearly defined goals and objective.		
	Develop a better understanding of the impacts of the loss of		

	genetic variability of agrobiodiversity due to chemical stress.	Lebanese Agricultural Research Institute, American University of Beirut, Aammiq Wetland and within the protected areas). - Development of sexual and asexual propagation protocols for selected indigenous plants as well as the establishment of both experimental and demonstration field plots to evaluate production alternatives for selected indigenous species in various regions. - Plans, mainly at Balamand University, to establish a public aquarium, and an aquaculture pilot station to replenish resources and to provide industry with fish. - local nursery for the production of wild and local varieties of fruit tress with more than 40 000 seedlings/ plantlets (over a period of 4 years) - Studies and research on the characterization of local germplasm of olive and fruit species via morphological descriptors and molecular markers. - breeding activities on wheat, barley, chick pea, within collaborative projects with ICARDA and LARI In addition genetic diversity of crops, and of harvested valuable economic species are conserved within the context of international funded projects: - Crop wild relatives and landraces in Lebanon are a rich reservoir of genes for drought-stress tolerance adaptation to dryland environments. However, they are under rapid genetic erosion and the Agrobiodiversity project (LARI/ GEF/UNDP) attempted to conserve them both *ex situ* in genebanks and *in situ* in original habitat to meet the present and future needs. In a complementary effort, the Agrobiodiversity Project tested the *in situ* or on-farm biodiversity conservation through promotion of its profitable utilization by farm families and communities. Both approaches are essential for maintaining the rich genetic diversity of crop wild relatives and landraces in Lebanon and providing breeders, molecular biologists and other scientists with sources of drought-tolerance genes. This project worked with the local farmers and rural communities to protect biodiversity by linking conservation with sustainable use and new livelihood opportunities.	

		-The Project on "Mainstreaming Biodiversity Management Considerations into Medicinal Plants Production Processes" (LARI/GEF/UNDP) focuses on 7 globally significant species of wild Medicinal and Aromatic Plants (MAPs) that are commercially traded and threatened by current harvesting practices. The project aims at integrating conservation objectives into their gathering process and to involve the local communities in their sustainable harvesting, processing and marketing in order to maintain the wild stocks of these MAPs. The project follows the ISSC-MAP standards in which the principle 4 states that local communities' and indigenous people customary rights to use and manage collection areas and wild collected medicinal and aromatic plants (MAPs) resources shall be recognized and respected. The Criterion 4.2 focuses on Benefit Sharing and states that Agreements with local communities and indigenous people are based on appropriate and adequate knowledge of MAP resource tenure, management requirements, and value.	
	Establish a national database for crops, weeds and livestock, including a database for tracking livestock migration and immigration.		
	Establish germplasm banks, cyro-preservation and tissue culture technologies to conserve living material.		

Global goals and targets	*NBSAP actions related to the global target*	*Lebanon contribution to progress towards the global target*	*Obstacles and needs*
Promote sustainable use			
Goal 4. Promote sustainable use and consumption.			
Target 4.1: Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity.	Support research on sustainable use of resources, applied agrobiodiversity, grazing pressure and biological diversity, and encourage research on native forage crops. Implement legislation for the sustainable use of natural resources. Establishing ecological tourism associated with public awareness and environmental education. Reforestation, along with related issues as forest management, plant nurseries , choice of species to be used in this process.	Consideration related to sustainable use of biological resources were incorporated into national legislations as follows: - Law for the Protection of Environment (law 444/02) has dedicated an entire chapter for the management of natural resources and conservation of biological diversity – specifically articles 47 to 49 which call for the protection and sustainable use of biodiversity. - The draft law regulating access to and benefit sharing of biological and genetic resources of Lebanon has been prepared but not yet submitted for endorsement. - Draft framework law for protected areas which is pending endorsement tackles the issue of sustainable use inside the nature reserves while the existing laws establishing the current protected areas deal only with strict conservation. However, sustainable harvesting in the some protected areas is introduced in form of honey production following training sessions on beekeeping and protection of milliferous plant species, processed food items out of wild fruits (molasses, jam, distilled rose water, etc) and wise collection from the surroundings areas of the reserve and sale of culinary and medicinal plant species at the entrance of the reserve. Actions related to sustainable management of biodiversity and production of biodiversity based products from sustainable use are mainly related to: - Promotion of the wise use of living resources inside the nature reserves: marketing of products (traditional food, handicrafts etc.) produced by the local communities surround the reserves, application of organic farming in some nature reserves to demonstrate to the farmers the techniques and benefits of organic farming and how to prevent chemical insecticides and pesticides from impacting non target species	- There is a need of the proper enforcement of legislation related to sustainable use. - Actions taken at national level are related mainly to protection and conservation of biodiversity with little attention to sustainable use. - There is no clear strategy and common vision concerning sustainable use. -Sustainable use of biodiversity is mainly limited to ecotourism activities, organic farming and the protected areas to a limited degree in addition to other activities implemented within the context of international funded projects within pilot sites.

		through the use of biological safe alternatives, promotion of ecoutourism activities in the reserves and bed & breakfast in the local communities locations surrounding the reserves in addition to organization of eco-guide training program for locals, programmes related to beekeeping and honey production in some nature reserves in addition to training program for locals on the sustainable consumption of medicinal and aromatic plants surrounding the reserves to generate MAPs based products. -The Agrobiodiversity project aimed at promoting the conservation of wild relatives and landraces of important agriculture species in Lebanon through introducing the in-situ and on-farm conservation mechanisms for the conservation and sustainable use of Agrobiodiversity. The project has executed activities that encourage biodiversity- based products in the project's sites in the dryland of Beqaa region through the establishment of two agro-food centers, a fattening unit for Herders Cooperative, support for a fruit trees nursery operated by a local NGO, organisation of training sessions on agro-food processing at the premises of the mentioned NGO for the cooperatives and women groupings in the Project Sites, organization of an international conference on "Promoting Community-Driven Conservation and Sustainable Use of Dryland Agro-biodiversity" at ICARDA (April, 2005), organization of training on organic farming to the local farmers in the projects sites and the execution of a research study to assess the potential uses of wild fruit trees, the project produced a final document on policy options at the farm-household, community and national levels that promote sustainable agrobiodiversity conservation and sustainable management of natural resources. -Since 1993 the Lebanese Agricultural Research Institute (LARI) has been carrying out research in relation to the Lebanese medicinal plants. This might enhance the progress of medicine in the agricultural sector and would allow endangered species find a field of	Areas of forests, agriculture and aquaculture ecosystems need more actions of sustainable managements and their products need to be enclosed within a clear strategy for sustainable use.
	Scientific and technical studies to promote development and sustainable use of medicinal plants and melliferous species.		Mariculture is not favoured by local industries because the production cost is high and far from being competitive.
	Study the fishing sector scientifically (practices, needs, potential, and stocks).		
	Identification of the potentialities of the Lebanese natural habitats and terrestrial ecosystems.		
	Identify all types of traditional industries that were marine oriented such as salt production and sponge fishing.		
	Develop new sectors such as mariculture in order to improve employment conditions of marine operators including fishermen (co-operatives) and ensure favourable local environmental conditions.		
	Establish a data base system for fresh water richness and endangered species		
	Expand fresh water fish farms to reduce pressure on natural habitats.		

	Introduce sustainable harvesting into some protected areas like honey production. Choose the optimal criteria of forest trees (age and diameter) for a sustainable use. Create partnerships with the local population, particularly the fishermen and local municipalities for the use of marine and coastal resources in a sustainable manner NGK's could play a catalytic role in this.	valorization in the food industry sector which will help in preserving them and ensuring a potential new income to the Lebanese industry. Ways should be found to cultivate these species and prove their status as being sustainable resources for the Lebanese economy in a way that would enhance women labor in poor rural areas thus would have a positive impact on rural development. However there are constraints encountered in this field related mainly to the limited cooperation with local and regional scientific institutions working on herbal, medicinal and aromatic plants. -Sustainable activities through agriculture were promoted in Lebanon by many initiatives related to organic farming mainly: The "Healthy Basket" program implemented by the American University of Beirut aims at promoting agriculture as a viable livelihood strategy through its support to organic farming, SARD project: Sustainable Agriculture and Rural Development executed from 2000 till 2005 by World Vision (American NGO) with financial support from USAID, SABIL project: Sustainable Agribusiness Initiative in Lebanon executed by Word Vision-USAID from 2005 till 2008 on Organic Farming, Biocop Loubnan: organic farming cooperative supported by World Vision with funds from USAID and other donors, the YMCA through the SMART programme who promoted the cultivation of MAPs especially *Oreganum syriacum* in order to minimize pressure on ecosystems, Arcenciel (NGO) who promoted the organic farming and composting activities as well, ASAIL project: Action for Sustainable Agroindustry in Lebanon executed from 2006 till 2008 by Vitech consulting (multidisciplinary Lebanese consulting firm mainly involved in the agrofood sector) and ACDI-VOCA (American NGO), in addition to Mercy Corp, CHF (two American NGOs) and IDAL (Public institution: Investment Development Authority of Lebanon which promoted organic farming programs. - The "Healthy Basket" Program executed by AUB and mentioned above was boosted in 2006 by a project "Land and People" that used mobile clinics to visit farmers across the South in the 2006 conflict to assist them having	

		products grown organically and certified by Libancert, Lebanon's organic certification body. Later, Land and People became part of IBSAR (AUB's Initiative for Biodiversity Studies in Arid Region). - A project entitled: "Bioprospection: An alternative for sustainable agricultural development" in Lebanon funded by MERCY Corps was launched in 2001 for a 5 years duration. The project was executed by the different faculties at the American University of Beirut in collaboration with Ohio State University (USA) and the University of Toledo (OH, USA). The project main aim was to rely on collaborative research, using biotechnology, to generate new plant-derived commercial products from indigenous Lebanese plants (biodiversity). The purpose is to diversify the agro-industrial portfolio in Lebanon, promote sustainable agro-industrial growth in rural communities; identify a short list of key plant species with potential medicinal, bioactive, and/or ornamental value, assess their potential markets and initiate their production. Presently, the Bioprospection project entails: • The extraction and identification of active ingredients of several Lebanese endemic plants that have shown biological activities • The complete chemical profiling of plants showing agricultural, economical and medicinal value • The extraction of essential oils from plants of high commercial value • The chemical profiling of extracted essential oil -The University of Balamand (UOB) is conducting a long-term project on "Assessment of Commercial Fish Species". The purpose of this project is to evaluate fish species landings by administering a survey to fishermen in the major fishing ports in North Lebanon. Species type, quantity, economic value and fishing effort are being calculated. The project is implemented in collaboration with the FAO. Until 2008, the main outputs of interest are: • Development and validation of the socio-economic, fish catch and fishing effort surveys.	

		• Training workshops on fisheries management techniques was provided by FAO fisheries specialist to the Marine Resources and Coastal Zone Management Program (MRCZM) team at UOB in 2005. The mission was fully supported by FAO. • Data collection occurs on regular basis since August 2005. • Involvement of students from the Department of Environmental Sciences in data collection on a regular basis. • List of boats and related fishing gears at all ports in North Lebanon was produced. • Contact details of all fishermen cooperatives/syndicates were gathered. • Catalogue of fish species caught by fishermen was produced. The project contributed to the target through the NBSAP action "Study the fishing sector scientifically (practices, needs, potential, and stocks)". -The project "Mainstreaming Biodiversity Management Considerations into Medicinal Plants Production Processes" which started in JULY 2008 (4 years project), aims at introducing a certification system for sustainable harvesting and integrating conservation objectives into the gathering, processing and marketing of globally significant Medicinal and Aromatic Plants (MAPs) in Lebanon. The project will follow the ISSC-MAP standards which provides a framework of principles and criteria that can be applied to the management of MAP species and their ecosystems, serve as a basis for monitoring and reporting on these species, and recommend requirements for certification of sustainable wild collection of MAP resources. This would help ensure the long-term survival of MAP populations in their habitats while respecting the traditions, cultures, and livelihoods of all stakeholders.	

		-In 2006, YMCA has initiated in close collaboration with the Ministry of Agriculture, a project funded by the Agence Espagnole de cooperation international and the fundacion biodiversidad concerned by the collection of data on *Pinus brutia* forests in 50 different locations in Lebanon. The purpose of the project was to suggest a growth model for *Pinus brutia* enabling a better determination of optimal criteria of age and diameter for a sustainable exploitation of pine forests.	

Target 4.2 Unsustainable consumption, of biological resources, or that impacts upon biodiversity, reduced.	Highlight the cultural, traditional and artistic significance of the sea by encouraging non-destructive traditional sports. Regulate grazing/ Solving the problem of overgrazing: identification and promotion of adequate fodder plants and pasture areas. Organize hunting to sustain equilibrium in ecosystem, provide economic incentive and allow for a recreational sport activity/Regulating hunting, including obligatory tests for acquiring necessary permits. Develop new legislation or update existing ones as regards to fishing periods, fishing technology, gear, etc. to protect turtles and marine mammals. Reduce tourism (e.g. no visits during fire hazard season, Sept-Oct). Expand fresh water fish farms to reduce pressure on natural habitats.	-The Ministry of Agriculture has issued decisions on fishery stating that marine living resources shall be harvested in a sustainable manner. The Ministry has issued many decisions banning the fishing by using dynamites and trawling nets. In addition to decision banning the fishing of marine turtles, cetaceans and monk seals issued in 1999 as well as selling, use or trade of any derivates from the mentioned species. However the main obstacle remains the proper enforcement of legislation. -The hunting regulatory law in Lebanon (law no. 580 dated 25/2/2004) regulates hunting practices and promotes the sustainable hunting of game birds and animal species. However the law is not implemented yet due to the need of development of related implementation decrees. - Based on the law 444, draft EIA and SEA decrees were prepared by the Ministry of Environment and submitted to the Council of Ministers for endorsement. Although the decrees were not endorsed yet, EIAs studies are being conductied, mostly for major development, infrastructure and industrial projects including marinas and quarries and are submitted to the MoE for review and verification of their compliance with environmental standards and sustainable management of natural resources before receiving approval. The development of SEAs studies for plans and programmes was initiated as well. This contributes to the minimizing of negative impacts on biodiversity from unsustainable consumption of natural resources.	Unsustainable consumption, of biological resources, are mainly applied in nature reserves, there is a need for proper enforcement of legislation regulating the unsustainable practices and consumption outside protected areas. There is also a necessity to develop concerns on possible overharvesting of certain species such as fish and molluscs and medicinal plants.

	Reduce excessive use of agrochemicals through publications on integrated pest management, broad-spectrum pesticides, multiple cropping/ season, extension programmes, etc. Develop an education campaign on biodiversity conservation, to increase public awareness of the threats to agrobiodiversity. Develop a framework to assess the potential impact of agrochemical on biodiversity, and to identity the levels of biodiversity that are likely to be affected. Develop a better understanding of the impacts of the loss of genetic variability due to chemical stress.	- The Forest Code issued in 1949, regulates forestry practices and consumption of forest resources mainly logging, charcoal production etc…The enforcement and supervision of the Forest Code is under the responsibilities and mandate of the Ministry of Agriculture. In addition the law forbids grazing in cut forest for a period of ten years. The Ministry of Agriculture is currently thriving to widen this legal binding to cover also forests sites impacted by fire events. Nonetheless, no data is available on the carrying capacity of the pasture in Lebanon and accordingly no control on grazing pressure is being applied. On the other hand, the Minister of Agriculture has issued decisions for regulating the harvesting and export of some target wild species: Decision regulating the export of all medicinal and aromatic plants, decision prohibiting the picking and export of ferrula plant & roots and decision regulating the harvesting of Oregano and Salvia. Other measures to reduce unsustainable consumption are addressed in various activities and initiatives mainly within the frame of international biodiversity related projects operating in MoE, MoA and LARI such as the MedWetCoast, the Protected Areas the Agrobiodiversity project and the Medicinal and Aromatic Plants project. Those activities include the promotion of in-situ conservation, sustainable use, ecotourism, organic farming, biodiversity based products, income generating activities, raising public awareness to reduce unsustainable practices that impact upon biodiversity, and conducting training to the local communities about sustainable consumption and production processes etc .	

Target 4.3: **No species of wild flora or fauna endangered by international trade.**	- Apply strict regulations on imported germplasms (plants, animals, fish, birds)	-The hunting law (No.580/2004) banned the export of hunted preys without a special permit from the Ministry of Environment. - Apart the ban of use and trade of endangered species in the nature reserves, legal measures were set for the use and trade of only some target endangered species through ministerial decisions issued by the Minister of Agriculture as follows: - Regulation of the export of all medicinal and aromatic plants (Decision 92/1 dated 28/2/1996) - The ban of import and introduction of all cedar seeds and plants (Decision 108/1, dated 12/9/1995) - The ban of picking and export of ferrula plant & roots (Decision 177/1 dated 26/8/1998) - The regulation of the harvesting & export of oregano and salvia (Decision 340/1 dated 1/8/1996) - The ban of export of all trees products whether forest or fresh water trees and of charcoal of Lebanese origin (decision 38/1 dated 7/4/1982) -The ban of fishing of whales, monk seals and marine turtles and the use of their derivatives for commercial purposes. (Decision 125/1 dated 23/9/1999) - Lebanon, is not a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) which aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival. Even though Lebanon is non party yet to the CITES, the Ministry of Agriculture/Directorate of Animal Resources which is the authority responsible of the supervision of the veterinarian health of the animals exported and imported in Lebanon, is also granting permits for the export/import of animal species listed in Annex1 of CITES, these permits known as “CITES permits” are given after consultation with a scientific committee. However, the CITES regulations are not fully enforced while issuing the CITES permits.	- CITES is not ratified yet by Lebanon. -The access to endangered species is regulated efficiently only in nature reserves. - The few legislation regulating the trade of endangered target species outside nature reserves are not well enforced. -Trade of wild species is not regulated properly in Lebanon. - A draft law regulating access to Lebanon genetic resources was prepared but not endorsed yet. - There is a need for species specific rules and regulations targeting various endangered species. - Reporting on species endangered by international trade is limited by gaps in knowledge on current harvesting levels and gaps on impacts on

			populations and sustainable levels of harvesting, as well as on the extent and impact of international trade in species and products which is mostly unregulated. - Capacity and resources to enforce laws on illegal harvesting is a challenge.

Global goals and targets	*NBSAP actions related to the global target*	*Lebanon contribution to progress towards the global target*	*Obstacles and needs*
Address threats to biodiversity			
Goal 5. Pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced			
Target 5.1. Rate of loss and degradation of natural habitats decreased.	Conduct environmental/ economic assessments for new construction projects, buildings, roads, etc., in agricultural areas.	-Draft EIA and SEA decrees were prepared by MoE based on the law 444 related to the protection of environment. The draft EIA decree states that all major development, infrastructure and industrial projects will have to undergo an EIA study including effects on biodiversity, in order to promote conservation activities before receiving approval. The draft SEA decree aims at mainstreaming environmental considerations into sectoral plans and programmes at a national level. Once issued, the implementation of the SEA decree would de facto lead to the minimization of adverse impacts of plans, programmes and policies on biodiversity including habitats loss and land use change. Although the EIA decree is not endorsed yet, many EIAs studies have been conducted based on law 444 issued in 2002 including construction projects, roads, buildings, dams, marinas etc… and SEAs studies are being initiated as well thus contributing to the reduction of natural habitat loss and degradation from main projects, plans and programmes.	-Lack of indicators to assess trends in habitats degradation. -Need for proper future implementation of the "National Forest Fires Strategy" endorsed recently by the Council of Ministers to contribute to the reduction of degradation and loss of forest habitats due to forest fires. -Need for proper future implementation of the "National Action Plan for
	Establish land use and zoning standards and policies.		
	Lease lands for use and avoid ex-appropriation.		
	Characterize and classify protected areas. (mapping, protection, rehabilitation, updating inventories).		
	Establish core (Biodiversity warehouses) and buffer zones with access to fire-fighters and restricted vehicles.		
	Limit further industrial Development along the coast.		

	Expand fresh water fish farms to reduce pressure on natural habitats. Conduct a comprehensive survey of the situation of the coastal zone and review land use maps and legislation. Impact assessment of projects dealing with water storage (dams, lakes) is needed prior to project execution. Establish a water quality control system and implement safe water use programmes. Well-drilling should be managed to conform to aquifer capacity. Preventing and combating forest fires. Regulate grazing/ Solving the problem of overgrazing: identification and promotion of adequate fodder plants and pasture areas. Reduce excessive use of agrochemicals through publications on integrated pest management, broad-spectrum pesticides, multiple cropping/season, extension programmes, etc…	-The national programme related to preventing and combating forest fires executed since 2007 and mentioned in chapter 2, is contributing to the reduction of habitats loss and degradation due to forest fires. Furthermore, the programme includes the restoration and rehabilitation of degraded and burnt sites that were subjected to the huge forest fires in 2007-2008. In addition, a National Forest Fires Strategy was developed and endorsed by the Council of Ministers in May 2009 and the future implementation of its activities will contribute to the decrease of habitats loss and degradation. - A National Action Programme (NAP) to Combat desertification was prepared by the MOA starting 2003 with the assistance of the GTZ, UNDP/DDC in order to fulfil the requirements of the UNCCD. The NAP was finalised in 2006 and its preparation process was based on participatory consultations between the various stakeholders. The NAP has described the current state of desertification and land degradation in Lebanon, has identifies its causes and effects, has defined priority actions aiming at combating desertification and reducing land degradation in Lebanon, has formulated related mitigation measures, and has identified gaps in legislation. Within the framework of the NAP, four Local Action Programmes (LAPs) were elaborated in four different areas of Lebanon that were considered with respect to a combination of topographical, agricultural, human and zoning criteria. The aim of the LAPs is to measure the human resources needs, to determine the desertification causes thus defining the necessary interventions to be later developed in form of proposals. - In order to face the challenge of green cover loss and forest habitats degradation, the Government of Lebanon has allocated in 2001 a budget of about 17 million USD to the Ministry of Environment to execute national reforestation activities in order to increase the forest areas to 20% of country's total surface (percentage of green cover in the country prior the war). Accordingly, The MOE has prepared a national reforestation/afforestation plan for 18,000 hectares of abandoned and	desertification" to contribute to the reduction of degradation and loss of natural habitats due to desertification.

		degraded land in all the Lebanese regions. The national plan defines the criteria of seed provenances, seedlings production, site selection, site preparation, forest roads construction, techniques of seedlings plantation, protection of planted sites (from grazing and from forest fires) and maintenance. The plan defines also the institutional and legislative mechanisms required for an efficient execution of the proposed activities. From 2002 till 2006, about 600 hectares of land were replanted in more than 35 sites distributed in all Lebanese regions through two consecutives reforestation works phases. Furthermore, as further step to complement the on-ground investments undertaken under the National Reforestation Plan, the Ministry of Environment has initiated with co-funds from the Global Environment fund and collaboration of the United Nations for Development Program a project on "Safeguarding and restoring Lebanon's woodland resources" aiming at creating an enabling environment and capacity building for sustainable land management as a contribution to ecosystem stability, food security and improved rural livelihoods. The project, starting in January 2009 and ending in January 2014, with a total budget of 2,255,000 USD (of which 980 000 USD as GEF contribution and 1, 275,000 USD as Lebanese Government contribution), directly targets the development of a strategy to safeguarding and restoring Lebanon's woodland resources and assists its implementation through capacity building and execution of appropriate Sustainable Land Management policies and practices. Within the context of this project, airplane seeding of forest native species seeds was carried out in about 160 hectares in 11 sites in different rural regions, furthermore reforestation of 55 sites is planned to be executed in the upcoming fall season in 2009.	

		-In 2004, the Government of Lebanon has designed a general land use planning scheme for Lebanon (Shema d'Ammenagement du Territoire au Liban/SDATL) which accounts for the need to increase protected areas at national scale, and recognizes the ecological and the agricultural and cultural values of the different zones in Lebanon. This general scheme (SDATL) has been unofficially followed by land use planners for the past 5 years but in 26 February 2009, the Council of Ministers (CoM) approved in its Decision # 1 the adoption of this Master Plan. Based on the CoM decision, the related decree endorsing the Master Plan is in process of issuance. - In The forest law (1949) forbids grazing in cut forest for a period of ten years. the Ministry of Agriculture is currently thriving to widen this legal binding to cover also forests sites impacted by fire events. By its mandate, the Ministry of Agriculture has authority to monitor and regulate grazing on public lands but has also been granted authority to issue ministerial decisions forbidding access on private lands upon written request of the landowners. Nonetheless, no data is available on the carrying capacity of the pasture in Lebanon and accordingly no control on grazing pressure is being applied. - Emergency actions were taken also in Lebanon by the Lebanese Ministry of Environment (MoE) with financial and technical support of many partners to prevent and impede the loss and degradation of marine natural habitats which were affected by the oil spill catastrophe that resulted from July 2006 war. This was done by making physical changes consisting of two cleanup phases followed by waste management. In the first phase, floating or mobile oil was removed to avoid its movement to new sites; in the second the removal of remaining fuel oil off rocks and structures using High Pressure pumps was done. The oil waste generated from the oil spill and from both cleanup phases was removed and stored in safe storage and the treatment of waste was initiated in one site awaiting additional financial resources for completion in other sites.	

		The damage caused to coastal and marine resources was assessed and projects of site restoration and rehabilitation were proposed by the Ministry of Environment in order to assist the natural processes of the habitat in rebuilding a healthy, functioning natural ecosystem that works as it did before it was polluted or destroyed. The rehabilitation was initiated in Palm Islands Nature Reserve awaiting necessary financial resources for completion in other sites. Working with partners and stakeholders that include several Government States, regional and international organizations, international and regional financial institutions, international, regional and national non-governmental organizations and the private sector as well as national administrations and institutions already proved to be successful during the cleanup phases, the storage of contaminated debris and the already started waste management.	

Global goals and targets	*NBSAP actions related to the global target*	*Lebanon contribution to progress towards the global target*	*Obstacles and needs*
Goal 6. Control threats from invasive alien species			
Target 6.1. pathways for major potential alien invasive species controlled.	Exercise very close and strict conditions on introducing new species.	-Very limited work was done in Lebanon to identify or control or track the introduction of alien species and no significant measures were taken in this purpose. Invasive Alien Species are not yet considered a major threat to biodiversity in the country nor recognized as key element of strategy development. -Control of introduction of alien species is being performed mainly in protected areas. Within the protected areas, plans are in place and operating in respect of some (but not all, because of limited resources) of the invasive species threatening endemic species. Management plans of protected areas include the control of alien species. -Only few alien species of major concern to some scientists have been studied. These are limited to the identification of species but there aren't, however, any scientific publications on the risk assessment of these species in Lebanon even though it is considered by some specialists to be a real threat. -Only one Ministerial decision was issued by the Minister of Agriculture (Dec. 108/1 issued in September 1995) to ban the import and introduction of any Cedar seeds, seedlings and plants. This decision was issued in response to the uncontrolled introduction of trees from the *Cedrus* genus through the ornamental industry. -Within the National Biosafety Framework (NBF) elaborated by the Ministry of Environment in the context of the UNEP_GEF Biosafety project (2003-2005) to implement the provisions of the Cartagena Protocol, the issue of trading partners and neighbouring countries in relation to the control of threats of LMOs which might be invasive species to biodiversity and the issue of risk assessment for the threats of imported GMOs and LMOs were addressed. In addition, necessary interim procedures to regulate transboundary movement, handling and use of LMOs and GMOs	-A lack of data reported indicating that Lebanon did not have the basis to determine whether the country faces a problem with alien species. -There is a need to more studies concerning alien species and alien invasive species in addition to the need to carry out studies on risk assessment of these species, such assessment is completely lacking in Lebanon. - Indicators for trends in invasive alien species need to be developed. -Regulations need to be developed in relation to invasive alien species as well as programmes and measures for their control in addition to management plans for specific alien invasive species.
	Apply strict regulations on imported germplasm (plants, animals , fish , birds).		
Target 6.2. Management plans in place for major alien species that threaten ecosystems, habitats or species.	Encourage the use of native rather than introduced species for aquaculture, mariculture and agriculture.		

	Establish environmental screening procedures for importation of plant and animal species. Ban or strictly control the import of potentially invasive species, and establish quarantine controls on all imports.	handling and use of LMOs and GMOs were set through a draft biosafety decree that was developed based on the NBF within the context of the same project. However, these measures are not implemented yet, awaiting for the endorsement of biosafety decree. - In the National Reforestation Plan executed by the Ministry of Environment since 2002 in all Lebanese territories for rehabilitation and restoration of degraded forest areas, only the use of native forest trees in the reforestation activities was allowed with specific ban on the utilization of introduced alien species.	

Global goals and targets	*NBSAP actions related to the global target*	*Lebanon contribution to progress towards the global target*	*Obstacles and needs*
Goal 7. Address challenges to biodiversity from climate change, and pollution			
Target 7.1. Maintain and enhance resilience of the components of biodiversity to adapt to climate change.	Establish an environmental research station to study the ecological changes over time.	Lebanon, has prepared in 1999 its Initial National Communication on Climate Change where the vulnerability of terrestrial ecosystems, natural habitat, wildlife and coastal systems were studied and relevant adaptation measures proposed. Mitigation measures were also proposed for the conservation of forests, as they are the main carbon stock/sink of national GHG emissions. Through this process, biodiversity issues were indirectly linked to climate change impacts, specifically when forests and marine and terrestrial ecosystems were taken into account in the report. However, no national plan or strategy on Climate Change was established and in particular in relation with mitigating the effect of climate change on biodiversity in Lebanon.	Assessment of current needs is being done at present by the Enabling Activity project for the preparation of Lebanon Second National Communication to the UNFCC. The project was initiated since 2007 and is being executed by MoE with funds from GEF/UNDP. The Second Communication is expected to be finalised in 2010.
Target 7.2. Reduce pollution and its impacts on biodiversity.	Water sources polluters should be asked to reduce pollution, pay to rehabilitate or encouraged to alleviate pollution pressure. Identify hot spots and land based sources of pollution in addition to man-caused maritime sources of pollution such as petroleum. Introduce incentives for a clean industry and legislate for "polluter pays" principle. Conduct environmental impact assessment surveys prior to construction of treatment plants.	-Based on law 444 related to the Protection of Environment, EIAs studies are conducted to major projects mostly for wastewater treatments systems, solid waste, marinas, quarries, building centres, and hospital waste treatment. Thus contributing to the reduction of pollution impacts on biodiversity from projects in both construction and operation phases. The MoE is reviewing the studies and provides its approval for the execution of the projects if they compile with environmental conditions, if not the projects are refused and sometimes viable alternatives or mitigation measures are proposed according to the case. - Chapter 3 of the Law of Protection of Environment was dedicated to incentive measures, article 4 has addressed the polluter pay principle, articles 12 and 23 are related to the mechanisms of environmental pollution monitoring, articles 54,55,56,57,58,61, 62 and 63 have addressed penalties on infractions to the environment. However, the enforcement of these measures still	- Implementation decrees related to the law 444 need to be developed specially in relation to the incentive measures in order to start their enforcement, the principle of the "polluter payer" is still not applied as well. - Measures related to mitigation of environmental pollution exist but not specifically targeting

	Establish contingency Plans to combat pollution or mitigate their harmful effects. Develop an environmental monitoring programme:or pollutants and other bio-indicator.	needs the development of relevant implementation decrees. - The Marine Research Center (CNRS) undertakes monthly surveys to assess the quality of water with regards to land based sources of pollution. The information is published yearly in the Lebanese Science Journal and the Marine Center/ CNRS has published a 25 years report of the collected information on the hot spots for pollution. - The CNRS has developed the National Action Plan: "Follow up of impact contamination by the hydrocarbons on the Lebanese sea environment" This program was adopted after the pollution by the black tide that hit the Lebanese coasts in July 2006, which aims to evaluate the impact of this pollution on the whole marine ecosystem. A strategy following three phases was elaborated: Short term – 2006, Middle term – 2007, Long term -2011. - The CNRS has also developed a National Action Plan to monitor the effect of the fuel pollution along the Lebanese coast. Accordingly it is undertaking monthly surveys that cover other pollutants in reference to certain bio indicators. -Major actions were taken in Lebanon by MoE with financial and technical support of many partners to reduce the pollution and its impacts on marine and coastal biodiversity upon the oil spill catastrophe that occurred on the Lebanese shorelines resulting from the hostilities of July 2006, where the damage caused to coastal and marine resources was assessed, emergency cleanup operations were carried out in the affected sites followed by waste management. The cleanup operations were done in two phases: In the first phase, floating or mobile oil was removed to avoid its movement to new sites; in the second a higher level of cleanliness was required as it involved the removal of remaining fuel oil off rocks and structures using High Pressure pumps. The oil spill and both cleanup phases generated oil waste that was removed and stored in safe storage. The Ministry of Environment identified the most feasible and environmentally sound Oil Spill Waste Management solutions for Lebanon and a Waste	biodiversity in addition it need more enforcement.

		management concept has been finalized and shared with stakeholders and potential partners through dissemination, and the treatment of waste was initiated in one site awaiting additional financial resources for completion in other sites. More specifically, many actions were taken in Palm Islands Nature Reserve (PINR) by MoE with the support of the international agencies following the oil spill catastrophe, a project was implemented in PINR in 2006-2007 aiming at assessing the effect of the oil spill on the biophysical environment of the islands through conducting terrestrial and marine surveys with ecotoxicological laboratory analysis, and resulted in the development of a short, medium, and long term monitoring plan of indicator/ key species and physical parameters of PINR based on the information collected in the biodiversity survey and pollution assessment. In addition, emergency clean up operations from the oil spill were also executed in the reserve in 2006. Moreover, another project was initiated in 2007 and is now under implementation for the removal of oil contamination that remains in the Reserve as well as implementing a monitoring program for the marine part of the island. -Regarding pollution from industrial activities, the Ministry of Environment (MOE) undertakes the review of the applications for the permits for classified industrial establishments and either refuses the application due to the potential enormous threats that may occur from the industrial establishment to the environment and that cannot be alleviate by any mitigation measure, or provides its approval after defining the necessary environmental conditions for the construction and operation of the establishment. These conditions aim at the prevention of the threats and impacts that may cause the industrial activity on any component of the surrounding environment including natural resources and biodiversity. However, the authority responsible for granting the permits for the industrial establishment is the Ministry of Industry which received the decision of the MoE through the "National Industrial Permits Committee" established in each Governorate and in which MoE is represented.	

Global goals and targets	*NBSAP actions related to the global target*	*Lebanon contribution to progress towards the global target*	*Obstacles and Needs*
Maintain goods and services from biodiversity to support human well-being			
Goal 8. Maintain capacity of ecosystems to deliver goods and services and support livelihoods			
Target 8.1. Capacity of ecosystems to deliver goods and services maintained.	Establish a water quality control system and implement safe water use programmes. Strengthen plant aquaculture to produce protein and organic matter efficiently. Enhance the economic impact of monitoring programmes such as coastal quality monitoring for bacterial indicators in order to enhance the market value of the local beaches. Study the fishing sector scientifically (practices, needs, potential, and stocks). Identify all types of traditional industries that were marine oriented such as salt production and sponge fishing. Specify species that are under-utilized or with potential for economic impact. Highlight the unique nature of terraces and the coastal historical settlement sites since prehistory (e.g. sites used for the manufacture of stone tools in Rauche). Enhance the concept of integrated village developing traditional industries and other related activities associated with coastal areas such as olive oil and carob production.	- As human well being is intimately related to the quality of preservation of the environment and consequently to the maintenance of goods and services from biodiversity, Ecotourism and rural tourism have been developed quickly in recent years in Lebanon. However, unregulated tourism still occurs and creates a risk of degradation of ecosystems. Hence the need for expansion of sustainable ecotourism. - Forest resources are maintained on satisfactory level through the actions taken by the Ministry of Environment and the Ministry of Agriculture but the situation is difficult with poaching where in many cases sustainable practices are neglected. - Capacity of agricultural lands to deliver goods and services on sustainable basis is enhanced by introduced agri-environmental measures. - In general, all measures taken to ensure sustainable farming, fishery and forestry, as well as water use promote the maintenance of capacity of ecosystems to deliver goods and services. But these measures are not applied to all ecosystems and in all the practices. - The marine fish diversity has been investigated in north Lebanon and is now being investigated in South of Lebanon to identify fish stocks, and implement new fishing methods.	_ There is a need to regulate tourism activities in beach resorts to avoid the risk of overexploitation of ecosystem resources. - There is a need to proper law enforcement to control violations and maintain the sustainability of ecosystems and their capacity to deliver goods and services. - Violations are recorded regarding mainly illegal logging, charcoal production, and to certain extent unsustainable fishing practices and techniques, use of agrochemicals and pesticides in agriculture. -Insufficient education and public awareness regarding wise exploitation of ecosystem capacity.

	Support research on sustainable use of resources, applied agrobiodiversity, grazing pressure and biological diversity, and encourage research on native forage crops.		
	Establish nature reserves on several sites representing the major eco-geographical areas of Lebanon, that have a wide diversity of naturally growing plants and animals, and with as many wild relatives of agricultural crops as possible.		
	Develop guidelines and standards for designing and implementing an agrobiodiversity-monitoring network on arable land.		

Global goals and targets	*NBSAP actions related to the global target*	*Lebanon contribution to progress towards the global target*	*Obstacles and needs*
Goal 8. Maintain capacity of ecosystems to deliver goods and services and support livelihoods			
Target 8.2. Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people maintained.	Spatial and temporal organization, in other terms planification, of all actions related to management of forests and ranges for productivity considering each and every forest product or service identified in the NBSAP. Develop new sectors such as mariculture in order to improve employment conditions of marine operators including fishermen (co-operatives). Establish traditional Farms to maintain and propagate the traditional or "heritage" varieties or breeds that are being replaced by "modern" varieties. Establish a service to facilitate the exchange of material between farms, and disseminate local or regional collection to appropriate sites. Establish at least one botanical garden for ex-situ conservation of perennial crops including cultivated trees, annuals and biennials. Set up recreational areas, tourist centres, and open-air theatres to attract visitors for enjoyment, education, participation and economic involvement. Set up, wherever possible, zoos,	Initiatives to maintain biological resources that support local livelihoods, are mainly carried out within the context of projects in pilot sites: **Agrobiodiversity** The agrobiodiversity project executed from 1999 till 2004 promoted the conservation and preservation of important wild relatives and landraces of agricultural species by introducing and testing *in-situ* and on-farm mechanisms and techniques of conservation and sustainable use of agro-biodiversity in three pilot sites located in rural dryland areas in Lebanon. Four potential sources of income to the target communities and farmers were investigated: apiculture, local food processing, processing of fruits from wild species and eco-tourism and related training were provided to the locals. Community based cultivation of fruit trees and medicinal plants through Ministry of Agriculture and support from international Programmes. Conservation and wise use of wild medicinal and aromatic plants to ensure their maintenance as natural resources and also as source of food security and health care for local people in rural areas is ensured by the project "Mainstreaming Biodiversity Management Considerations into Medicinal Plants Production Processes" (LARI/GEF/UNDP) (2008-2012). The project, aims at introducing a certification system for sustainable harvesting and integrating conservation objectives into the gathering, processing and marketing of globally significant Medicinal and Aromatic Plants (MAPs) in Lebanon. The project will follow the ISSC-MAP standards which provides a framework of principles and criteria that can be applied to the management of MAP species and their ecosystems, serve as a basis for monitoring and reporting on these species, and recommend requirements for certification of sustainable wild collection of MAP resources. This would help ensure the long-term survival of MAP populations in their habitats while supporting local livelihoods and respecting the traditions, cultures, and livelihoods of all stakeholders.	-Illegal practices and violations and overexploitation of biological resources that support sustainable livelihoods, local food security and health care are recorded -Need of proper law enforcement for exploitation of biological resources outside nature reserves. -Difficulty in providing alternatives to inappropriate practices. -Non-availability of a socio-economic systematic national programme and long term studies and action plan -Need to further promote and apply the concept of sustainable and wise use of biodiversity components -Increased demand by locals for goods and services from natural resources - Short term priority; principle of

	aquaria and aviaries for educational and touristic purposes. Help in establishing zoos and aquaria for endemic specicies. Establish botanical gardens in cities , national parks Encourage the use of native rather than introduced species for aquaculture, mariculture and agriculture. Scientific and technical studies to promote development and sustainable use of medicinal plants and melliferous species. Expand fresh water fish farms to reduce pressure on natural habitats.	Organic farming practices are promoted in specific sites through support from international project and programmes, and the collaboration of NGOs. **Inland water** Several programmes and projects are on-going addressing at the issues of livelihoods support, access rights and sustainable resource utilization (Protected Areas and MedWetCoast project; and USAID/ YMCA Programmes) **Marine and coastal** Strengthening local Communities through Livelihood Security has been part of the activities implemented in Tyre Coast Nature Reserve and Palm Islands Nature Reserve, mainly through the protection of fish spawning grounds and the development of the eco-tourism sector which provides locals with new job opportunities. **Forest and Mountain** Ministry of Agriculture is giving permits for supporting local livelihoods such as harvesting some culinary plants and clearing dense maquis to benefit locals from wood for charcoal production and to combat fire at the same time. The reforestation efforts by the Ministry of Agriculture with carob and pine tree are to allow the local communities harvest them for marketable resources.	sustainability not well understood and recognized by the locals - Regular awareness and training for locals on environmentally friendly activities such as organic farming, establishment of nurseries, and production of biodiversity based food and products through wise use etc…are limited within projects' activities in the project sites thus there is a need for regular rural programmes at national level.

Global goals and targets	*NBSAP actions related to the global target*	*Lebanon contribution to progress towards the global target*	*Remarks*
Protect traditional knowledge, innovations and practices			
Goal 9 Maintain socio-cultural diversity of indigenous and local communities			
Target 9.1. Protect traditional knowledge, innovations and practices.	Develop partnership and co-ordinate action with all concerned parties such as the government, the industry, and NGK's for the protection of marine and coastal biodiversitry and conduct public awareness campaigns targeting society at large. Identify all types of traditional industries that were marine oriented such as salt production and sponge fishing. Create partnerships with the local population, particularly the fishermen and local municipalities for the use of marine and coastal resources in a sustainable manner. NGK's could play a catalytic role in this. Enhance the concept of integrated village developing traditional industries and other related activities associated with coastal areas such as olive oil and carob production. Establish traditional farms to maintain and propagate the traditional or "heritage" varieties or breeds that are being replaced by "modern" varieties.	- The management plans of the nature reserves incorporate policies promoting traditional knowledge, innovations and practices of local communities. - Within the protected areas, there are increased levels of community participation and use of indigenous knowledge systems in the use of biological resource and sustainable management practices. - The Agrobiodiversity project which was executed in three rural dryland sites, has conducted socio-economic surveys to assess the use of target species and related local knowledge, and made zoning using local community knowledge. - Some training sessions were provided to local communities within the context of some projects' activities to revive traditional practices: training on agro-food techniques, traditional processing of aromatic and medicinal plants, traditional fishing practices… - Salt industries in North Lebanon were very flourishing in the late 70s and Sponge fishing has totally stopped in Lebanon since the 1970s. -In North Lebanon, one small industry for smoking salmon fish is active. -THE IMAC project worked to preserve traditional industries such as the salt extraction industry by promoting local salt products, rehabilitating the existing wind mills and establishing a Salt museum, i.e. in Deir al Natour; and to protect the traditional boat manufacturing industry and copper making. One of the objectives of this IMAC project consists of maintaining the cultural identities, traditions and skills of local communities. - The Marine center/ CNRS always tries to involve fishermen in researches ongoing on marine biodiversity or fisheries to place detectors, locate interesting spots etc… but no	- Absence of a national legislation with special provisions protecting traditional knowledge, innovations and practices and protecting the rights of the local communities over them and their rights to benefit-sharing. - The current intellectual property regimes do not provide adequate protection for the traditional knowledge, as they consist of the regular provisions that can be found in copyright, patent, and trademark laws. -The only legislation prepared is the draft Law on access to genetic resources and benefit sharing ensuring the rights of local communities in sharing the benefits arising out of the utilisation of their natural resources however the law is pending

		systematic partnership is clearly established with fishermen. Instead, the traditional knowledge about weather, sea topography and hotspots are used and documented by the researchers. - The LARI/GEF/UNDP project on "Mainstreaming Biodiversity Management Considerations into Medicinal and Aromatic Plants (MAPs) Production Processes" known as MAPs project follows the ISSC-MAP standards in which the principle 4 states that local communities' and indigenous peoples' customary rights to use and manage collection areas and wild collected MAP resources shall be recognized and respected. The Criterion 4.2 focuses on Benefit Sharing and states that Agreements with local communities and indigenous people are based on appropriate and adequate knowledge of MAP resource tenure, management requirements, and value.	endorsement and its issuance needs long period of time.

Target 9.2. Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit-sharing.	Develop new sectors such as mariculture in order to improve employment conditions of marine operators including fishermen (co-operatives). Recruit locals to work on site in protected areas (guards, technicians, etc.) and provide suitable training. Collect entry fees to protected areas, and reduce prices for the local population.	- A draft law on "access and benefit sharing" was developed in the year 2005 and once issued will lead to the regulation of the access to the Lebanese biological and genetic resources and the fair and equitable sharing of the benefits arising out of their utilization with the government of Lebanon, the land owner/owners and/or the local communities where the biological and genetic resources are located through the signature of an "access and benefit sharing" agreement with them. Thus this will ensure the rights of local communities over their lands and related natural resources. However the protection of the rights of local communities over their traditional knowledge, innovations and practices including their rights in sharing the related benefits is not regulated in any law till now. - In protected areas, the priority is given to local communities to work on site in the different activities related to the management of the reserve. - Income generating activities to local communities are being executed within protected areas and other projects, and related training and support are being ensured. These activities provide a way in creating partnership with local	

		communities for the promotion of traditional practices and the use of natural resources in a sustainable manner. - The laws creating and governing the reserves neither authorize the collection of entrance fees, but they do not grant the legal status for the reserve committees to do this. The Ministry of Environment has prepared a Draft Framework Law for Protected Areas that is still awaiting endorsement. The draft framework law accounts for the need to recognize the legal identity of the reserve committees granting them, among others, the right to collect entrance fees and to issue citations upon violations. The MOE pre-established Terms of Reference and procedures for jobs and positions for the management of the nature reserves and encourage to give the local communities from the surroundings of the protected areas the highest priority to work on sites as rangers, guides, managers, labors, technicians and to conduct required work such as establishment of infrastructures and other facilities. - As mentioned above, the LARI/GEF/UNDP project on "Mainstreaming Biodiversity Management Considerations into Medicinal and Aromatic Plants (MAPs) Production Processes" known as MAPs project follows the ISSC-MAP standards in which the principle 4 states that local communities' and indigenous peoples' customary rights to use and manage collection areas and wild collected Medicinal and Aromatic Plant resources shall be recognized and respected. The Criterion 4.2 focuses on Benefit Sharing and states that Agreements with local communities and indigenous people are based on appropriate and adequate knowledge of MAP resource tenure, management requirements, and value. The project focuses on seven significant wild medicinal and aromatic plant species and and aims at integrating conservation objectives into their gathering process and to involve the local communities in their sustainable harvesting, processing and marketing.	

Global goals and targets	*NBSAP actions related to the global target*	*Lebanon contribution to progress towards the global target*	**Obstacle and needs**
Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources			
Goal 10. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources			
Target 10.1. All transfers of genetic resources are in line with the Convention on Biological Diversity, the International Treaty on Plant Genetic Resources for Food and Agriculture and other applicable agreements	Exercise very close and strict conditions on introducing new species. Establish a service to facilitate the exchange of material between farms, and disseminate local or regional collection to appropriate sites. Establish a national database for crops, weeds and livestock, including a database for tracking livestock migration and immigration. Apply strict regulations on imported germplasm (plants, animals , fish , birds). Establish environmental screening procedures for importation of plant and animal species. Review all international and regional conventions, protocols and agreements regarding biodiversity to determine their relevance to the State of Lebanon, and prepare a framework for effective participation.	- Lebanon has developed in 2005 a draft law on access to genetic resources and benefit sharing in line with the CBD provisions and based on the Bonn guidelines. The draft law regulates the access to the Lebanese biological and genetic resources and their components, their sustainable use and the fair and equitable sharing of the benefits arising out of their utilization. According to the draft law, any person or entity that wishes to access the biological and genetic resources of Lebanon should submit an application for that purpose to the Ministry of Environment accompanied with a legalized Prior Informed Consent obtained from the owner or owners of the property or site where the biological and genetic resources will be collected, subject of the application. If the application was approved, an Access and Benefit Sharing Agreement must be signed between the applicant and the Ministry of Environment, the land owner or owners and/or the local communities where the biological and genetic resources are located. The signed agreement shall constitute the applicant's official authorization to access the biological and genetic resources. The draft law has stated four types of agreements that can be entered into: 1) Academic research agreement. 2) Conservation of biological and genetic resources agreement. 3) Commercial research agreement. 4) Commercial exploitation agreement. - The access and consumption of forest trees (logging, charcoal production etc…) and extraction of any natural products and derivatives from the forests are regulated by the Forest Code issued in 1949 under the management and supervision of the Ministry of Agriculture. In addition, the export of all trees products whether forest or fresh water trees and of charcoal of Lebanese origin is banned through decision 38/1 dated 7/4/1982 issued by the Minister of Agriculture.	- The draft "Access and Benefit Sharing" law stipulates the transfer of genetic resources in line with the CBD, however the law is not endorsed yet and the main obstacle consists in the lengthy process needed for its issuance. - In the absence of a law on "Access and Benefit Sharing", the access and transfer of genetic resources in Lebanon especially wild plants in common lands is not well controlled. - The access and use of forestry resources is regulated by the Forest Code, however violations are recorded and there is a need to enhance the enforcement of the relevant legislation. - Apart from the forest resources, the access and transfer of only few target species are regulated by ministerial decisions, however the main

		- Except for the forest trees, the transfer of only four target wild species is regulated by ministerial decisions from the Ministry of Agriculture, this cover the regulation of harvesting and export of three wild plant species: Oregano, Salvia and Ferrula plant and roots. In addition to the ban of the import of cedar seeds and plants. - Regarding fauna, the fishing of whales, monk seals and marine turtles and the use of their derivatives for commercial purposes is banned by a ministerial decision from the Ministry of Agriculture. In addition, the export of hunting preys (birds and animals) requires a special authorisation from the Ministry of Environment under the hunting law.	obstacle remains the lack of proper enforcement of the provisions of these decisions.

Global goals and targets	***NBSAP actions related to the global target***	***Lebanon contribution to progress towards the global target***	***Remarks***
Goal 10. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources			
Target 10.2. Benefits arising from the commercial and other utilization of genetic resources shared in a fair and equitable way with the countries providing such resources	Investigate potential linkages with the Biotrade Initiative, the ICGB Program and other international initiatives, particularly with regard to controlling bioprospecting and ensuring sustainable benefits.	Once the draft "Access and benefit sharing" law will be endorsed, any scientific, medical, pharmaceutical, commercial, or legal results derived from the access to, use, research, experiments, and developments of the biological and genetic resources in Lebanon should be shared in a fair and equitable manner with the State and the local land owner or owners and communities whose biological and genetic resources were involved in the activity of the applicant. The sharing of such results shall be provided for in an Access and Benefit Sharing Agreement, which will describe the benefit sharing method that the parties to the agreement shall agree upon, and the share of each one of them.	- In the absence of a national "Access and Benefit Sharing" law, no benefits arising from the commercial use or other use of Lebanon genetic resources is shared at present in an equitable way with the Government of Lebanon. - In few cases, benefit sharing agreements are signed within the context of a bilateral cooperation between a foreign institute and an academic or research institution in Lebanon.

Global goals and targets	*NBSAP actions related to the global target*	*Lebanon contribution to progress towards the global target*	*Remarks*
Ensure provision of adequate resources			
Goal 11: Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention			
Target 11.1. New and additional financial resources are transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with Article 20.	Ensure that all development assistance agencies with programmes in Lebanon are aware of the Biodiversity Strategy and Action Plan, and develop a framework for inter-ministerial co-ordination to prevent conflicting externally supported development activities. Explore and implement funding arrangements for both priority and long-term activities identified in the National Biodiversity Strategy and Action Plan.	Being a developing country, Lebanon is continuously exploring means to mobilise financial resources from international donors namely the GEF, FFEM, EC-life Third Country allowing the execution of projects for the implementation of the NBSAP and the Convention. The budget mobilised till present for projects on biodiversity is estimated about 10.4 Million USD. Until now, the main international funds mobilised aimed at the execution of the following biodiversity related projects: enabling activities projects for biodiversity and biosafety, protected areas related projects, agrobiodiversity project, projects related to sustainable hunting and protection of migratory birds species and recently a project on mainstreaming biodiversity consideration into medicinal and aromatic production processes and a project on safeguarding and restoring Lebanon's woodland resources.	Three is a need for more financial assistance to Lebanon to allow the effective implementation of the Convention in all biodiversity areas mainly in the areas where studies and activities are still lacking in Lebanon such as: marine and fresh water ecosystems, ex-situ conservation, alien invasive species and taxonomy.

Global goals and targets	*NBSAP actions related to the global target*	*Lebanon contribution to progress towards the global target*	*Remarks*
Ensure provision of adequate resources			
Goal 11: Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention			
Target 11.2. Technology is transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with its Article 20, paragraph 4.	Review bilateral and multilateral development and technical assistance programmes related to biodiversity or having biodiversity components, and prepare a framework to optimise participation	Being a developing country, the transfer of some technology to Lebanon is realized within the context of some international funded projects and bilateral cooperation.	Technology transfer is reported as in its preliminary stage in Lebanon, there is a need to more financial resources and transfer of technology to enable Lebanon to effectively implement its commitment under the Convention in all areas and thematic programmes covered by the CBD. In relation to genetic resources and biotechnology, another obstacle exists too: the transfer of technology is still lacking and even in the limited instance where technology is transferred to Lebanon, the lack of applied research in some cases was translated to ineffective technology not adapted to Lebanon.

4.2. Section B: Progress towards the Goals and Objectives of the Strategic Plan of the Convention

In 2002, and ten years after the Convention on Biological Diversity was opened for signature, the Strategic Plan was developed in order to guide the further implementation of the Convention at the national, regional and global levels. The COP 6 adopted the text of the Strategic Plan and urged the parties to review their activities, especially their NBSAPs in light of this Strategic Plan.

By adopting the Strategic Plan, the Parties to the Convention have committed themselves to achieve, by 2010, a significant reduction in the rate of biodiversity loss at the global, national and regional levels, as a contribution to poverty alleviation and to the benefit of all life on earth

Lebanon did not establish national goals to achieve the relevant goals and objectives of the Strategic Plan, nevertheless actions implemented at national level to implement the Convention and the NBSAP have contributed to certain extent to progress towards these goals and objectives. The assessment of this progress will be presented in the table below whenever relevant.

Goal 1: The Convention is fulfilling its leadership role in international biodiversity issues
1.1 The Convention is setting the global biodiversity agenda
1.2 The Convention is promoting cooperation between all relevant international instruments and processes to enhance policy coherence
1.3 Other international processes are actively supporting implementation of the Convention, in a manner consistent with their respective frameworks
1.4 The Cartagena Protocol on Biosafety is widely implemented
1.5 Biodiversity concerns are being integrated into relevant sectoral or cross-sectoral plans, programmes and policies at the regional and global levels
1.6 Parties are collaborating at the regional and subregional levels to implement the Convention
Objectives 1.1, 1.2 and 1.3 all relate to the effectiveness of the Convention on Biological Diversity in representing biodiversity concerns on the international stage and within the work of other international conventions. Detail of implementation of the Cartagena Protocol (Objective 1.4) is provided under goals 2.3, 2.4, 3.2 and 4.2 below. Objective 1.5: Evidences of the integration of Biodiversity concerns into relevant national sectoral and cross-sectoral plans, programmes and policies are detailed in target 3.3 below as for the integation of Biodiversity concerns into relevant sectoral or cross-sectoral plans, programmes and policies at the regional and global levels, this is achieved to certain extent in the regional projects and initiatives in which Lebanon is a part and some examples are described in target 1.6 below. Objective 1.6 about Parties engaging in regional and sub-regional implementation activities: Such collaboration is ensured in Lebanon within the context of regional projects in which Lebanon is a part and through bilateral or multilateral agreements, of these: the Conservation and Sustainable Use of Dryland Agrobiodiversity in the Near East project which includes Lebanon, Jordan, Palestine and Syria, the MedWetCoast project aiming at the conservation of biodiversity in two Ramsar sites: Tyre Coast Nature Reserve and the Wetland of Aamiq and which is a part of a Mediterranean initiative under the Ramsar Convention that includes

along with Lebanon, Albania, Tunisia, Morocco and the Palestinian Authority, the project on Integrated Management of Cedar Forests in Lebanon in collaboration with other Mediterranean countries namely Algeria, Cyprus, Lebanon, Morocco, Syria and Turkey, the Millennium Seed Bank (MSB) project within the Partnership agreement between Lebanon and the Royal Botanic Gardens Kew/ UK, the project on Mainstreaming Biodiversity Management Considerations into Medicinal Plants Production Processes which includes Lebanon and the Palestine Authority.

Through these regional and sub-regional initiatives, collaboration among the participating countries is ensured in different areas related to the conservation and sustainable use of biodiversity according to the scope of the project or the agreement and its objectives which contribute in the implementation of the Convention.

This collaboration between concerned countries is ensured through workshops and thematic meetings conducted at regional level, and through exchange of tools and materials where information sharing, exchange of experience, expertise, know-how and lessons learned are performed.

Goal 2: Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention

2.1 All Parties have adequate capacity for implementation of priority actions in national biodiversity strategies and action plans

Lebanon has sufficient scientific and technical resources which enabled it the implementation of many priority actions of the NBSAP that was issued in 1998 however not in all areas covered by the national strategy.

A review of the NBSAP in 2005 through the NBSAP draft addendum has shown that capacity was available mainly in the following areas where positive progress was made: *In- sit*u conservation in particular protected areas, traditional knowledge, research, training, public awareness and education and Environmental Impact Assessment. On the other hand, the review revealed that the main execution of NBSAP actions covered the following ecosystems: terrestrial biodiversity (forest, mountain and dry and sub-humid lands) and agriculture biodiversity which revealed an adequate capacity in these fields.

However, the review highlighted areas of deficiencies which included taxonomy, monitoring, alien species, *ex-situ* conservation, genetic resources, biotechnology and incentive measures.

The lack in taxonomic capacity was addressed by the Ministry of Environment after the issuance of the NBSAP through a needs assessment study. However the document also indicated the low priority allocated for monitoring activities as these require continuous research, observation and sustainable financial resources none of which are made available through funded projects.

Capacity is needed (1) to address issues of alien species, invasive alien species and *ex-situ* conservation where limited measures were taken in this regards in Lebanon; (2) to enforce the national legislative measures that MoE has developed on access to genetic resources and benefit sharing and transboundary movements of GMOs and LMOs once the related national draft legislation will be officially endorsed, and (3)to implement the legal instruments regarding sustainable use and incentive measures that were addressed through the law of Protection of Environment #444 dated 2002 but still lack proper enforcement.
In terms of ecosystems, there is a lack of capacity for the implementation of priority actions of the NBSAP in the marine and fresh water ecosystems.

The findings of chapter 2 reveal the progress made in Lebanon in the implementation of priority actions of the 1998 NBSAP .

2.2 Developing country Parties, in particular the least developed and the small island developing States amongst them, and other Parties with economies in transition, have sufficient resources available to implement the three objectives of the Convention

Lebanon, as developing country, is constantly exploring assistance programmes to implement the provisions of the Convention on Biological Diversity. Project proposals are being continually prepared to mobilize necessary financial resources from international donors in the biodiversity field. So far many biodiversity related projects were implemented through international funds mainly from the GEF and to certain extent FFEM and EC-life Third Country. The total budget mobilised till present from international donors to implement various projects related to biodiversity which contribute to the implementation of the objectives of the CBD is estimated about 10.4 Million USD (covering biodiversity and biosafety enabling activity projects, protected areas projects, Agrobiodiversity and medicinal & aromatic plants related projects, projects related to hunting and protection of migratory birds, safeguarding and restoring Lebanon's woodland resources.)

Regarding national source of funding, a considerable budget of 16.5 Million USD was allocated from the national funds to implement a national reforestation plan in all Lebanese territories.

Nevertheless, Lebanon still needs further financial resources to implement the various thematic programmes covered by the CBD and the three objectives of the Convention. The findings of chapter 2 and 3 of this report highlights Lebanon's progress with respect to the CBD objectives and revealed that Lebanon had many programs and initiatives in place that address the first objective of the CBD, "conservation of biodiversity", however the second objective "sustainable use" has received less attention and the third objective "fair and equitable sharing of the benefits" was lacking.

2.3 Developing country Parties, in particular the least developed and the small island developing States amongst them, and other Parties with economies in transition, have increased resources and technology transfer available to implement the Cartagena Protocol on Biosafety

Lebanon benefited in 2004-2005 from a financial assistance through a UNEP/GEF project to develop the "National Biosafety Framework" (NBF). The project was executed by the Ministry of Environment in collaboration with UNDP and with technical support of a group of scientists "IBSAR" from the AUB, the NBF was finalised in 2005. The NBF provides a background on biodiversity and biosafety in Lebanon, the biosafety policy, the regulatory regime, the administrative framework, the monitoring, inspection, and enforcement, and public awareness, e
ducation, and public participation for the implementation of the provisions of the Cartagena Protocol on Biosafety.

Within the context of the same project a draft decree to implement the provisions of the Cartagena Protocol was developed. The draft decree provides the necessary interim procedures to regulate the transboundary movement, import, export, passage in transit, contained use, release into environment, direct use as food, feed, and processing, handling, transportation, use in research and testing, and placing on the market, of goods containing LMOs with the aim of protecting the environment and the humans from the potential negative effects of the LMOs. However the decree is not endorsed yet.

Lebanon ratified later the Cartagena Protocol on Biosafety through law No. 31 dated 16/10/2008 and needs further resources and technology transfer for the proper implementation of the biosafety decree once issued and the implementation of all provisions of the Cartagena Protocol.

2.4 All Parties have adequate capacity to implement the Cartagena Protocol on Biosafety

Capacity is still limited regarding biotechnology in Lebanon. The NBF issued in 2005 revealed the finding of a survey executed in Lebanon in the same year which shows that there is a marginal involvement of industry, government agencies, non-government organizations, private sectors and international agencies in biotechnology related activities in Lebanon. Most biotechnology related activities are in academic institutions which possess number of relevant equipments however there is a general lack of capital and highly qualified trained experts. The survey also revealed that there is a serious lack of knowledge about GMOs among key stakeholders, a majority of whom did not really know if the products they used contained GMOs.

Therefore, Lebanon is in need to encourage and enhance the development and establishment of research centers designed to institutionalize biosafety frameworks and biotechnology research, other than the academic ones and the need of capacity building for government servants in the various related ministries about LMOs and related environmental concerns and identified potentials and prospective, especially specificities for Lebanon. In addition to the need for the creation and maintenance of a database on modern biotechnologies, GMOs (receiving, testing, disposal, import, export), and stakeholders involved in the field.

Furthermore, necessary capacity building is needed for the effective implementation of the provisions of the proposed national biosafety draft decree mentioned in section 2.3 above, mainly to effectively monitor activities handling GMOs and their products and enforce application of the related regulation.

Therefore, the implementation of the national biosafety decree in Lebanon requires systematic capacity building at different levels:

1. Application of the regulatory measures developed that will guide action vis- à- vis all GMO-related activities;
2. “Operationalization” of the administrative systems on the responsibilities of different public and private agencies,
3. Synergizing efforts and cooperation between the involved ministries and other agencies,
4. Capacity for risk assessment and management and GMOs categorization criteria, analysis and listing through a central body that is qualified for this function as well as supporting infrastructure;

Implementation of the public participation approach, which need not remain rhetorical, but implemented in practice through clear public participation channels and mechanisms.

2.5 Technical and scientific cooperation is making a significant contribution to building capacity

Technical and scientific cooperation is ensured within the context of regional projects in which Lebanon is a part and through bilateral or multilateral agreements, of these: the Conservation and Sustainable Use of Dryland Agrobiodiversity in the Near East project which includes Lebanon, Jordan, Palestine and Syria, the MedWetCoast project aiming at the conservation of biodiversity in two Ramsar sites: Tyre Coast Nature Reserve and the Wetland of Aamiq and which is a part of a Mediterranean initiative under the Ramsar Convention that includes along with Lebanon, Albania, Tunisia, Morocco and the Palestinian Authority, the project on Integrated Management of Cedar Forests in Lebanon in collaboration with other Mediterranean countries namely Algeria, Cyprus, Lebanon, Morocco, Syria and Turkey, the Millennium Seed Bank (MSB) project within the Partnership agreement between Lebanon and the Royal Botanic Gardens Kew/ UK, the project on Mainstreaming Biodiversity Management Considerations into Medicinal Plants Production Processes which includes Lebanon and the Palestine Authority.

Through these regional initiatives, scientific and technical cooperation is ensured among the participating countries through training sessions, workshops and thematic meetings conducted at regional level where information sharing, exchange of experience and expertise and lessons learned are performed which contribute to capacity building.

In addition, in both regional and national projects executed with international funds (protected areas project, biodiversity enabling activities, development of biosafety framework etc…) capacity building is provided to public servants, local communities, academicians and relevant target groups through workshops, transfer of information and expertise, exchange of tools and materials, establishment of CHM and websites and in particular through training session.

However, technical cooperation is still needed with Lebanon for necessary capacity building in the different areas covered by the CBD, mainly in the following fields where sufficient capacity is lacking in Lebanon: marine biodiversity, inland biodiversity, taxonomy, ex-situ conservation, and alien invasive species.

Goal 3: National biodiversity strategies and action plans and the integration of biodiversity concerns into relevant sectors serve as an effective framework for the implementation of the objectives of the Convention

3.1 Every Party has effective national strategies, plans and programmes in place to provide a national framework for implementing the three objectives of the Convention and to set clear national priorities

In 1998, Lebanon developed a National Biodiversity Strategy and Action Plan (NBSAP) to fulfil the requirements of Article 6 of the Convention on Biological Diversity through the "Biodiversity Enabling Activity" project executed by the Ministry of Environment (MoE) with the support of UNDP/GEF.

The NBSAP set nine goals and fourteen objectives, with specific planned actions on the sho medium, and long term based on analysis of the situation of the biodiversity in the country a the identification of constraints, and it is supposed to be implemented by different stakeholders the biodiversity field.

The NBSAP was an important step for addressing biodiversity issues in Lebanon as it serves the basic framework by which biodiversity conservation and its sustainable utilisation has been structured.
In 2oo5, a review of the NBSAP was performed and resulted in the development of a draft addendum to the National Biodiversity Strategy and Action Plan through the "Top-Up Biodiversity Enabling Activity" project executed by the by the Ministry of Environment (MoE) with the support of UNDP/GEF and technical assistance of a group of scientists "IBSAR" from the AUB.

However, there is a need to undertake an effective updating of the NBSAP in light of the more recent requirements of the CBD and to issue the above mentioned draft addendum in its final form.

3.2 Every Party to the Cartagena Protocol on Biosafety has a regulatory framework in place and functioning to implement the Protocol

The Lebanese Ministry of Environment has developed in 2005 a "National Biosafety Framework" (NBF) setting the regulatory framework to implement the Cartagena Protocol on Biosafety with support of UNEP/GEF and UNDP and technical assistance of a group of scientists "IBSAR" from the AUB.

The NBF covers the existing biosafety related policies in Lebanon and proposes the future national biosafety policy structure by: setting its four strategic objectives, defining its five principles, providing guidelines for the identification of the targets and methods of biosafety management, defining thirteen rules for the biosafety management system, and identification of necessary guidelines, technical norms and standards that need to be developed for the

implementation of the mentioned rules. The NBF identifies as well the capacity building needs requirements for the implementation of the national biosafety policy.

Furthermore, the NBF proposes guidelines for the development of a new biosafety decree on interim regulatory measures for the implementation of the provisions of the Cartagena Protocol on Biosafety and sets the components and articles of the proposed decree.

In addition, the NBF proposes an administrative system for the implementation of the biosafety decree by identifying the Ministry of Environment as the National Competent Authority (NCA) on biosafety related issues and by proposing the establishment of a National Biosafety Council (NBC) and defining its members and its role, and by defining as well the future mandate of other national administrative authorities in implementing the necessary measures regarding GMOs.
The NBF proposes as well the decision-making channels and mechanisms particularly in risk assessment and risk management, system for handling the notification of any proposed activity related to GMOs and requests for permits and time frame for decision making and the mechanisms of access to information.

The NBF proposes also guidelines for the preparation of a system for monitoring and inspection the activities handling GMOs and their products and for enforcement of the related regulations.

Moreover, the NBF covers the need for public participation for the effective implementation of the provisions of the Cartagena Protocol on Biosafety and the related proposed national decree, and sets the objectives, means and capacity building needs for public participation in addition to national needs for public awareness and education and for research.

Within the same context, a draft decree regulating biosafety issues to implement the provisions of the Cartagena Protocol was developed based on the NBF. The decree sets the necessary interim measures to regulate the transboundary movements, handling and use of GMOs and LMOs with the aim of protecting the environment and the humans from their potential negative effects.

However these regulatory measures are not implemented yet awaiting the endorsement of the draft biosafety decree and afterwards the availability of needed resources and capacity for its proper enforcement.

3.3 Biodiversity concerns are being integrated into relevant national sectoral and cross-sectoral plans, programmes and policies

The protection of the environment and natural resources in general and the conservation and development of green cover in particular have been integrated into the Government's policy statement in 2007. The latter supports the cooperation between the private and the public sector locally, regionally and internationally, and calls for incorporating environmental principles in the policies and programs of all development sectors, and to activate the legislation, monitoring and guiding role of the Ministry of Environment.

The principle of biodiversity protection was adopted by the law for the Protection of Environment (Law No.444 dated 29/7/2002). The principle stipulates that all activities should avoid causing damages to the different components of the biodiversity.

In addition, the law 444 has dedicated an entire chapter for the management of natural resources and conservation on biological diversity - specifically articles 47 to 49 which call for the protection and sustainable use of biodiversity, the establishment of nature reserves, regulating access to genetic resources and for public participation as well pubic and private institutions participation in the conservation of biodiversity and the sustainable use of natural resources.

Based on the law 444, draft EIA and SEA decrees were prepared by the Ministry of Environment and submitted to the Council of Ministers for endorsement. The draft EIA decree includes details related to various steps of EIA system (screening, scoping, review and monitoring). The draft decree states that all major development, infrastructure and industrial projects likely to threaten the environment due to their extent, nature, impact or activities will have to undergo an EIA study, in order to promote conservation activities and sustainability of natural resources before receiving approval. The EIA draft decree has listed in its annexes- related to the content of impact assessments studies- biodiversity as one of the component to be addressed in the EIA study. Thus, the EIA studies that are being conducted and submitted to MoE identify potential impacts of relevant projects on environment including the biodiversity component.

The draft decree for implementation of SEA at the national level was prepared by the MoE in 2005 through a project aiming at mainstreaming environmental considerations into sectoral plans and programmes (project funded by EC-life third countries and managed by UNDP). SEA being a tool to mainstream environmental sustainability in public planning and decision making, the implementation of the related draft decree, once issued, would de facto lead to the minimization of adverse impacts of plans, programmes and policies on biodiversity.

Moreover, based on the need for the integration of biodiversity components into impact assessment processes, the SEA project developed in 2005 practical guidelines, in the form of a manual, for the integration of biodiversity considerations into SEA and EIA.

It is worth here to mention, that despite that EIA and SEA decrees were not endorsed yet, the Ministry of Environment started requesting officially EIA studies since 2002 based on the law 444 for major development and infrastructure projects and the request of SEA studies for plans have been started since 2005. Through these EIA and SEA studies, impacts of related projects and plans on all environment components including biodiversity are addressed. (annexes of EIA and SEA draft decrees related to the content of impact assessments studies have listed biodiversity as one of the component to be addressed in the studies).

Regarding integration of biodiversity into national plans, programmes and policies related to main sectors:
Some have addressed directly biodiversity considerations such as the "**National Reforestation Plan**" (NRP) prepared by the Ministry of Environment in 2001 and executed since then, the "**Hunting Law**" issued in 2004, the "**Strategy for Agricultural Development in Lebanon**" prepared by the Ministry of Agriculture in 2004, the "**National Master Plan for land Management in Lebanon" "SDATTL"** prepared by the Council for Development and Reconstruction in 2004 and approved by the Council of Ministers in 2009 and the "**Desertification National Action Plan"** prepared by the Ministry of Agriculture in 2003, the "**National Strategy for Forest Fires**" in Lebanon issued in 2009 although did not refer explicitly to biodiversity but its implementation will contribute definitely to the conservation of forest biodiversity and ecosystems.
However the major challenge remains the extent of the proper implementation of the provisions of these policies and plans.

Other plans and strategies did not mainstream directly biodiversity considerations: the "**National Master Plan for Quarries"** prepared by the Ministry of Environment and issued in 2009 has integrated environmental considerations in general but not specifically biodiversity and the "**National Action Plan for Solid Waste Management in Lebanon"** issued in 2006 didn't refer to biodiversity but the locations defined by the Action Plan for the establishment of solid waste management facilities were subject in 2008 to impact assessment study before their establishment in order to evaluate their impact on the different environment components including their effects on the biodiversity.

Other main sectors have integrated environmental considerations but not specifically biodiversity, but cover natural resources and biodiversity among other environmental components thus contributing indirectly to biodiversity mainstreaming such as the following sectors: "**Tourism**" through promoting ecotourism activities, "**Education**" through the integration of environmental education within the school curricula into the various disciplines, "**Communication**" through the coverage of environmental news and issues in the media in addition to the internet, "**Economy and Trade**" through the Trade and Environment programme, "**Fisheries**" through the issuance of many decisions regulating fishing practices, "**Industry**" through the environmental conditions defined by the Ministry of Environment for the establishment and operation of each industrial establishment during the permit issuance process.

However, biodiversity was not integrated in other main sectors such as "**Water"** and "**Energy"**.

On the other hand the integration of Biodiversity considerations is done within the context of some projects such as: the LARI/UNDP/GEF project on "**Mainstreaming Biodiversity Management Considerations into Medicinal and Aromatic Plants Production Processes**" which aims to integrate conservation objectives into the gathering, processing and marketing of globally significant wild Medicinal and Aromatic Plants (MAPs) in Lebanon and foresees several actions aiming to mainstream biodiversity considerations into the MAPs production processes; the LARI/UNDP/GEF **"Agrobiodiversity project"** which promoted the conservation and preservation of important wild relatives and landraces of agricultural species by introducing and testing in-situ and on-farm mechanisms and techniques of conservation and sustainable use of agro-biodiversity in three pilot sites located in mountainous dry areas in Lebanon; in addition to many initiatives related to organic farming executed by academic institutions, NGOs and private initiatives that promote sustainable practices into the agriculture sector.

Biodiversity conservation is addressed directly or indirectly into the implementation of international conventions that Lebanon has signed or ratified such as the World Heritage Convention; the Ramsar Convention; the Cartagena Protocol on Biosafety; the United Nations Framework to Combat Climate Change; and the Convention to Combat Desertification.

The integration of biodiversity conservation into other sectoral and cross-sectoral policies, strategies, plans and programs are clearly presented in chapter III of this report. (see chapter III).

3.4 The priorities in national biodiversity strategies and action plans are being actively implemented, as a means to achieve national implementation of the Convention, and as a significant contribution towards the global biodiversity agenda

A review of the NBSAP in 2005 was performed through the NBSAP draft addendum and has shown that actions were mainly executed in the following areas: *In- sit*u conservation, traditional knowledge, research, training, public awareness and education and Environmental Impact Assessment.

Apart from the protected areas where major achievements have been done in Lebanon, *In situ* conservation efforts have been limited to small scale projects, private initiatives and research studies. Indigenous knowledge has been included in all projects and reports mainly out of obligation towards the international donors, but proper legislative procedures for the protection of traditional knowledge and the rights of local communities over them are still lacking in Lebanon. The NBSAP draft addendum indicated that the scientific community must become aware of this gap and bestow their effort to translate the scientific jargon of biodiversity into comprehensible information for the general public.

With respect to EIA, their application was officially requested by the Ministry of Environment since 2002 and the Ministry has received many EIA studies related to projects in various sectors whereby the Ministry reviews the studies and provides its approval after verification of their compliance with environmental protection conditions and sustainability of natural resources. The application of EIA has contributed to the minimisation of adverse and negative impacts on biodiversity from major projects in both their construction and operational phases.

In regards to financial issues, the majority of funds made for biodiversity initiatives in Lebanon are through collaborative projects with international donors. The Lebanese contribution is minimal in terms of both direct financial assistance and infrastructure support however a significant national financial contribution was made for the implementation of the National Reforestation Plan where funds of over 16.5 Milion USD was allocated from the national budget.

Apart from the national-based constraints, the top down approach of projects are hindering efforts because they are not tackling the immediate priorities and concerns in Lebanon.

Environmental legislation recently received significant support and power. In august 2002, the Law of Protection of the Environment has been officially endorsed covering the basic issues relating to environment, with a specific chapter dedicated to management of nature resources and biodiversity conservation. The new Law will provide the Ministry of Environment with more legal power to enforce and implement biodiversity related initiatives.
However, the NBSAP review highlighted areas of deficiencies in the NBSAP implementation which included taxonomy, monitoring, alien species, *ex-situ* conservation, genetic resources, biotechnology, incentive measures and to certain extent sustainable use.

The lack in taxonomic capacity was addressed by the Ministry of Environment after the issuance of the NBSAP through a needs assessment study. The review also indicated the low priority allocated for monitoring activities as these require continuous research, observation and sustainable financial resources which are not available constantly through funded projects.

A lack of data was reported indicating that Lebanon did not have the basis to determine whether the country faces a problem with alien species and invasive alien species and limited measures were taken in this regards.

The NBSAP draft addendum indicated that Lebanon had not adopted any national measures for *ex-situ* conservation, a priority that has received little attention and resource allocations.

Sustainable use and incentive measures were addressed in the law of Protection of Environment #444 dated 2002 but the proper enforcement is still lacking. With respect to sustainable use, the NBSAP review revealed that there was no clear strategy and a lack in awareness and common vision concerning this issue. The majority of projects undertaken for biodiversity issues did not integrate sustainable utilization to sufficient extent. Sustainable use of biodiversity was restricted to ecotourism activities and the protected areas to a limited degree and through some agrobiodiversity initiatives.

Incentives measures for environment conservation and sustainable use was reported as a new field for Lebanon and was stipulated for the first time in the law of Protection of Environment but it still needs the development of the related implementation decree for the execution of incentive measures at national level.

With respect to biotechnology, genetic resources and technology transfer, needed legislation were prepared regarding access to genetic resources and benefit sharing and concerning interim procedures to regulate the transboundary movements and use of GMOs and LMOs, however these have not been endorsed yet. Biotechnology and genetic resources and technology transfer were reported as in their preliminary stage in Lebanon due to low priority given from both the government and research institutions in addition to drastically limiting financial support and infrastructure. Even in the limited instances where technology is transferred to Lebanon, the lack of applied research was translated mostly into ineffective technology not adapted to Lebanon.

The addendum report indicated a deficiency in information exchange at the national level since Lebanon lacks a coordination unit and a proper mechanism for the exchange of information on the national level. The review indicated that the lack of efficient system for information exchange has lead to significant problems for biodiversity progress which is reflected in the double employment whereby many institutions work on the same issues and projects.

On the other hand, Lebanon has not developed a clear vision of ecosystems which is illustrated in the majority of proposals and projects submitted which sue the word “site” rather than “ecosystem. The five ecosystems mentioned in the NBSAP have been tackled through individual project in collaboration with international institutions and funding agencies, often overlapping, rather than through the national strategy or framework set in the NBSAP.

In addition, the finding of chapter 2 of this report shows that the main execution of the NBSAP covered the following ecosystems: terrestrial biodiversity (forest, mountain and dry and sub-humid lands) and agriculture biodiversity and that there is a lack in the implementation of priority actions of the NBSAP in the marine and fresh water ecosystems.

The NBSAP addendum summarizes the findings by highlighting Lebanon’s progress with respect to the CBD objectives indicating that Lebanon had many programs and initiatives in place that address the first objective of the CBD, “conservation of biodiversity”, however the second objective “sustainable use” has received less attention and the third objective “fair and equitable sharing of the benefits” was lacking.

Goal 4: There is a better understanding of the importance of biodiversity and of the Convention, and this has led to broader engagement across society in implementation

4.1 All Parties are implementing a communication, education, and public awareness strategy and promoting public participation in support of the Convention

A specific strategy for communication, education, and public awareness focusing specifically on biodiversity was not elaborated.

However the Service of Guidance and Awareness at the MoE executes continuously programmes related to environmental education, communication, capacity building and public awareness through workshops, training, exhibitions, press conferences etc… in addition to preparation of related awareness materials (posters, booklets, brochures etc.) for dissemination to the different stakeholders. The MoE through the activities of the Service of Guidance and Awareness has a vision of “Transforming the target audience of awareness into partners in environmental awareness”.

These campaigns executed by the Service of Guidance and Awareness are related to various environmental topics among them biodiversity and cover among other the organization of several workshops and roundtables to mainstream environment in the public sector (CDR, Ministries of Industry, Interior and municipalities, Social Affairs, Economy & trade, etc.) as well

as private sector (Association of Lebanese Industrialists, Agriculture Cooperatives, etc.), partnership with the civil society through organization of training to NGOs interested in environmental activities on different issues, in addition to a Small Grants Program launched in 1998 to provide financial support to NGOs to execute environmental projects. This mechanism, which follows scientific and objective principles for selection of NGOs and monitoring of their execution of the related projects, was transformed into a legal decree (#14865 dated 1/7/2005) which identifies the conditions and the mechanism of granting financial contributions by the Ministry of Environment to the NGOs for executing environmental activities. The implementation of this mechanism was done according to priorities defined by MoE, and a significant percentage of funded projects addressed biodiversity, forests and protected areas.

The Ministry of Environment has established a national biodiversity clearing-house http://www.biodiversity.moe.gov.lb which promotes communication about the issues regarding biodiversity and the achievements related to the implementation of the CBD in Lebanon and post relevant reports, publications, database and information. The national clearing-house is under the MoE website umbrella and is linked to the CBD clearing-house and other sites of interest.

At the present, the MoE website http://www.moe.gov.lb/ is posting information related to initiatives, activities, projects and news related to biodiversity, protected areas, national reforestation plan, forest fires among other environmental information.

International biodiversity projects functioning at MoE, LARI and different NGOs and academic institutions include public awareness, communication and education components, whereby different related materials were developed and activities were carried out as follows in particular for protected areas, agrobiodiversity, forest fires and forest conservation, hunting practices, fauna and flora species of particular importance:

- Educational materials: Guidebooks, slides, documentary films, training manuals, in additional to the organisation of training courses to target people (school teachers, eco-tour operators, nature reserves guides, farmers, fishermen, local communities).
- Media campaigns including radio contests, newspaper articles, TV interviews, billboards, TV spots, press conference.
- Awarness materials: brochures, pamphlets, booklets, posters, in addition to sensitization and awareness campaigns: lectures, workshops, exhibition.

The NCSR has developed two main databases: 1) ABHASS which is a database on research projects sponsored by NCSR in medicine, agriculture, environment, basic sciences, engineering and technology, economy, and related fields and 2) CNRS database which is the on-line catalog on "books, monographs, reports, theses, and research publications" held by the library in the Documentation Centre. These databases are linked to AGRIS, CARIS, CINDA, INIS, ENSDF (USA), CORDIS, CEA publications, FAO on line Catalog and INIST.

The NCSR is one of the major public institutions granting fellowships to Lebanese students to carry out higher studies (Ph.D) related to biodiversity, environment and sustainable development.

On the other hand, scholarships for students to continue a Masters degree in biodiversity field are provided by some international funded project namely the “Agrobiodiversity project” (LARI, UNDP/ GEF) and the project related to the “Integrated Management of Cedar Forests in Lebanon in collaboration with other Mediterranean countries” (MOE/UNEP/GEF).
In brief, the MoE has implemented many initiatives and activities for environmental guidance and awareness which cover various environmental components including biodiversity but no

specific strategy for biodiversity was elaborated in this regards. The major public awareness, education and communication activities related to biodiversity were executed within the context of relevant international funded projects executed buy the various institutions in Lebanon.

4.2 Every Party to the Cartagena Protocol on Biosafety is promoting and facilitating public awareness, education and participation in support of the Protocol

The National Biosafety Framework developed by Lebanon in 2005 addressed the issue of public awarness, eduction and participation in support of the Cartagena Protocol on Biosafety.

The NBF addressed the right of the public and the relevant stakeholders to obtain information about applications filed for the research, development, handling, transboundary movement, transport, use, transfer, release and management of GMOs, as well as participation in the decision-making process. The NBF stipulates the need for public participation and specifies the obligations of Parties to the Protocol in facilitating and promoting public awareness, education and participation, the NBF identifies as well the various national capacity building needs for public participation and education and identifies too the objectives and means of public awareness and participation.

The Lebanese framework will allow for public participation in the decision-making process, which is a requirement under the CPB. This participation as stated in the NBF will take place through the LBCH where information on the proposal that is being studied is provided, along with information to access the LBCH website through which the public can correspond with the NBC. The risk assessment report of a proposed activity will be posted on the LBCH website right after its submittal to the MOE. For 30 days, the public will have the opportunity to respond in writing to the NBC.

According to the NBF, the opportunities for public participation shall be made available through public hearings and announcements for public comments. For this purpose, during the 30-day period, discussions with stakeholders and the general public will be held by the NBC who will present a public feedback summary report to the MOE. Public response and feedback have to be taken into account by the MOE in the decision-making process.

The draft Biosafety decree developed in the same year based on the NBF, designated the Ministry of Environment as the National Competent Authority with respect of all matters that relate to LMOs and GMOs and proposes the establishment of a National Biosafety Committee (NBC) headed by MoE and including representatives of all concerned institutions, the draft decree includes an article on Public Education and Public Participation which states:
"*The National Competent Authority shall promote and facilitate the public awareness, education and participation concerning the safe transfer, handling and use of LMOs; and shall endeavour to inform the public about the means of public access to the information that relate to the safe transfer and use of the LMOs, through a special Internet website, brochures, leaflets, pamphlets, educational manuals, and other publications, as well as through seminars, workshops, professional discussions, and training program. Furthermore, the National Competent Authority shall involve the public and consult the stakeholders on LMO-related decisions in the framework of existing legislation*"

However the measures for public awareness, education and participation in support of the Protocol are not implemented yet awaiting the endorsement of the draft biosafety decree. Nevertheless, a Lebanese biosafety clearing-house (LBCH) http://biosafety.moe.gov.lb/ was established in 2005 and posts all outputs, reports and publications of the project on "Development of National Biosafety Framework". The LBCH can serve once the draft biosafety decree will be endorsed and its implementation starts, as an important forum for public involvement and for information dissemination where major GMO-related activities, under consideration, or awaiting a risk management study, or approval or clearance of relevant ministry can be posted on the LBCH and feedback solicited.

4.3 Indigenous and local communities are effectively involved in implementation and in the processes of the Convention, at national, regional and international levels

Involvement of local communities in the conservation and sustainable use of biodiversity, is ensured through:

1-Direct participation of local communities in the conservation and sustainable use of biodiversity: this is ensured mainly in the protected areas where the management team must be composed of members from local communities only, as pre-requisite from the Ministry of Environment. Thus, local people are involved in the nature reserves management planning and related management activities in addition to the creation of job opportunities for them in the nature reserves (guides, rangers etc…).

2-Capacity building of local communities: the local communities are targeted within the different awareness campaigns and training sessions on sustainable practices for the conservation and sustainable use of biodiversity, which are organised by the relevant ministries through national activities and also through activities organised within the biodiversity related international funded projects.

3-Income generating activities for local communities: different international funded projects have components aiming at rural development and poverty alleviation which includes among other the promotion of sustainable use of biodiversity by local communities (apiculture, eco-tourism, use of wild fruits and wild medicinal and aromatic plants in agro-food processing, organic farming, local healthy food, traditional food, handicrafts etc…) as well as providing alternative sources of income for local communities to reduce the pressure on natural biological resources (fattening unit to decrease the pressure on the degraded rangeland, trees nurseries to reduce pressure on natural habitats etc..)

4-Financial support to local communities, the MoE provides annual contribution to local NGOs for achieving activities and projects related to various environmental components including biodiversity. The funds are given based on the evaluation done by the Ministry of Environment upon submission of annual projects proposals by the NGOs, knowing that these proposals are developed by the mentioned NGOs according to the priority actions set by the Ministry each year. Furthermore, the MoE provides annual funds for the nature reserves' committees (in which local communities are represented) as contribution to cover partially the expenses of the reserves' management.

5- Activities of NGOs: the local communities are mainly involved in the implementation of activities that falls under the Convention through the various active local NGOs in Lebanon whereby several of them use collaborative management involving local or rural communities when addressing environmental issues. As an example, the SPNL (NGO) revived a traditional approach for the protection of important biodiversity sites based on local community initiatives. This traditional type of protected site is called 'Hima' and aims to conserve and manage the protected site by the local community and to promote the sustainable use of its biodiversity and the equitable benefit sharing arising from this use among local community. The "Hima" is declared protected through a decision issued by the local authority.

6- Creation of advisory national committees were the NGOs are represented:

- Committees for the overall supervision of the nature reserves were established for each nature reserve through a Ministerial Decision issued by the Minister of Environment. Each committee (Appointed Protected Areas Committee) appointed by the Minister of Environment and includes representatives from the local NGOs and local authorities along with representatives from the public, academic sector and scientists. Through these committees, the representatives are directly involved in advisory and decision making process related to the management of the nature reserve.

- Local NGOs are represented in the Higher Council for Hunting (HCH) established by the new hunting law (No. 580 /04). The HCH is under the guardianship of the Minister of Environment and includes representatives from concerned government, private and research institutions, associations and syndicates and NGOs and will play a major advisory role in the development and issuance of the required Ministerial decisions related to the regulation of hunting to be taken by the Minister of Environment.

In addition to the proposed legislations:

- The draft law on Access and Benefit Sharing (ABS) developed by the MoE in 2005 proposes the creation of an advisory committee headed by the Ministry of Environment and including representatives from relevant ministries and organizations and representatives from NGOs, the advisory committee will assist the MoE in its implementation and enforcement of the law, it will have mainly a major role in revising the ABS requests and suggesting its approval or rejection to the MOE. Knowing that one of the major principles provided for in the Draft ABS Law is the sovereignty of the State over biological resources; the State exercises said right in the name and for the benefit of the local communities.
- The draft decree for Protected Areas Category Systems for Lebanon prepared by MOE within the frame of the SISPAM project has proposed four category systems of Protected Areas corresponding to IUCN category system and which addresses the establishment of an effective structure for the local management. This issue was addressed mainly by the following proposed three categories:
  (1)The category of "**National Park**" which includes in its proposed management body: an appointed Park Management Committee working under the direction of an advisory group/council composed of local municipalities (or federation of municipalities), as well as agricultural cooperatives, shepherds, NGOs, tour operators and the scientific community. The Park Management Committee should have formal legal status (and an "artificial personality), able to receive funds directly from the Government of Lebanon and international organizations. (2) The category of "**National Monument**" which includes in its proposed management body: a local guard hired directly by the local municipality. The guard can also serve as local guide. In case the site falls on private land, the landlord should be invited to participate in site management. (3) The "**Protected Landscape/Seascape**" category which has among its objectives "to bring benefits to, and to contribute to the welfare of, the local community through the provision of natural products (such as forest and fisheries products) and services (such as clean water or income derived from sustainable forms of tourism)" and includes in its proposed management body: private landowners whose lands fall within the proposed landscape/seascape. Other stakeholders may include agricultural cooperatives and hunting associations, in addition to representatives from concerned ministries' and local municipalities. This category may accommodate a subcategory, the "**Hima**" System which is a traditional system of protected areas managed directly by the local community (mentioned above).

7- The implementation of some projects in pilot local sites:

-The Agrobiodiversity project (LARI/GEF/UNDP) aimed at promoting the conservation of wild relatives and landraces of important agriculture species in Lebanon through introducing the in-situ and on-farm conservation mechanisms for the conservation and sustainable use of agrobiodiversity with the direct participation of the local farmers and rural communities. This project worked with rural communities to protect biodiversity by linking conservation with sustainable use and new livelihood opportunities.

- The (LARI/GEF/UNDP) "Mainstreaming of Biodiversity Management Considerations into Medicinal Plants Production Processes" Project's idea is that non-destructive harvests, together with income generated by Medicinal and Aromatic Plants (MAPs) business opportunities for local people, will maintain the wild stocks of at least 7 globally significant MAP species that are commercially traded and threatened by current harvesting practices.

The project will create incentives for local communities to sustainably manage the wild stocks by ensuring the increased financial returns flow to the guardians of wild MAP stocks and are directly linked to sustainable harvest and management practices.

- The "Mainstreaming Conservation of Migratory Soaring Birds into Key Productive Sectors Along the Rift Valley/Red Sea flyway" project (MoE/GEF/UNDP) will use access to local communities as a means to mitigate the risks of the project.

In conclusion, the involvement of the local community in the implementation of the Convention is done through various initiatives and activities but the effective involvement of the local communities in decision-making is mainly limited to protected areas management. Apart protected areas, progress was made regarding the involvement of the local communities in decision-making processes related to biodiversity conservation and sustainable use through the measures proposed in the recently developed draft legislations mentioned above, nevertheless there is a need to take further measures to strengthen and widen this role.

4.4 Key actors and stakeholders, including the private sector, are engaged in partnership to implement the Convention and are integrating biodiversity concerns into their relevant sectoral and cross-sectoral plans, programmes and policies

Key actors and stakeholders like NGOs and private sector are involved to variable extents in the implementation of the CBD through implementing various programs that support achievement of the CBD objectives. In fact, the need to coordinate with the private sector has been expressed explicitly in the Government Statement in 2008, which affirmed that "*The Government of Lebanon is keen at protecting Lebanon's natural resources as it is concerned in providing a good life quality to the Lebanese generations, present and future. That is why the Government shall seek to establish a sustained environmental development through supporting the cooperation between the private and the public sector locally, regionally and internationally, as well as incorporating environmental principles in the policies and programs of all development sectors, and activating the legislation, monitoring and guiding role of the Ministry of Environment*".

At legislation level, the Law of Protection of Environment (Law 444/02) has dedicated an entire chapter for the management of natural resources and conservation on biological diversity - specifically articles 47 to 49 which call for the protection and sustainable use of biodiversity, the establishment of nature reserves, regulating access to genetic resources and for public participation as well public and private institutions participation in the conservation of biodiversity and the sustainable use of natural resources. In addition, the Law stipulates that concerned institutions, both in public and private sectors should carry out Initial Environment Evaluation (IEE) or EIA studies to projects likely to threaten the environment due to their extent, nature, impact or activities which cover all projects dealing with construction or other infrastructure, all activities affecting the natural environment through extraction or dumping of natural resources, or any proposed program, study, investment, or management that might affect a whole Lebanese area or a certain sector. The MoE undertakes the review of studies and consequently provides its approval after verification of their compliance with environmental safety conditions and sustainability of natural resources.

Actually, in the last past years a series of activities were initiated and implemented in partnership with the private sector, NGOs and academic institutions that integrate biodiversity considerations but these are mainly related to reforestation activities, awareness campaigns and the promotion of ecotourism, as examples of such cooperation between the public and private sectors are the eco-guide training program implemented by MoE/UNDP/GEF through the MedWetCoast project, the participation of NGOs in the overall supervision of protected areas management through their representatives in the Appointed Protected areas Committees under the custody of the Ministry of Environment, the partnership with the private sector for promoting ecotourism program in the protected areas, the partnership between the Ministry of Environment and the private sector for executing reforestation activities in all Lebanese territories within the context of the National Reforestation Plan, the

partnership since 2007 between the Ministry of Environment and a local NGO (AFDC) for the execution of the National Campaign on Forest Fires, the partnership between the Ministry of Environment and Academic institutions for implementing biodiversity related projects and research e.g. the partnership with the AUB regarding the implementation of the UNEP/GEF project on "Integrated management of Cedar forests in Lebanon in cooperation with other Mediterranean countries".
Private sector and NGOs are executing activities that integrate biodiversity considerations mainly related to Ecotourism and Agrofood. Examples of such programmes: the Dhiafee Program which was conceived by ANERA (American NGO) in 2006 in recognition of the outstanding potential for tourism to contribute to the economic development of communities throughout Lebanon and which offers to visitors the opportunity to stay in local communities where they can gain an authentic experience of life in Lebanon while helping in preserving local heritage, the creation of destination Lebanon website and tourism package with SRI (American NGO), the Lebanese Mountain trail which is the first national hiking trail in Lebanon, stretching 440 Km from north Lebanon till the south, and promoting socially- and environmentally- responsible tourism at the national level and which was conceived and implemented by a private environmental firm (ECODIT) with grant funding from USAID, in addition to many small tour outfitters at level of private sector and NGOs in Lebanon that cater to the outdoor adventure and offer trips that allow exploring the country's natural beauty and World Heritage Sites while leaving a minimal ecological footprint. These tour operators are embracing the ecotourism ethos although no legal status of ecotour operators is available yet in Lebanon.

Regarding agrofood, many initiatives are implemented by academic institutions and NGOs and private initiative such as: The "Healthy Basket" program implemented by the American University of Beirut which promotes organic farming, "Biocop Loubnan" which is an organic farming cooperative supported by "World vision" (American NGO) with financial support from USAID and other donors, SARD project: Sustainable Agriculture and Rural Development executed from 2000 till 2005 by World Vision - USAID, SABIL project: Sustainable Agribusiness Initiative in Lebanon executed by Wordvision-USAID from 2005 till 2008 on Organic Farming,the YMCA through the SMART programme who promoted the cultivation of MAPs especially *Oreganum syriacum* in order to minimize pressure on ecosystems, and Arcenciel (NGO) who promoted the organic farming and composting activities as well, the "Souk el Tayyeb" which is a private market of traditional food produced by small enterprises and based on sustainable practices, ASAIL project: Action for Sustainable Agroindustry in Lebanon executed from 2006 till 2008 by Vitech consulting (multidisciplinary Lebanese consulting firm mainly involved in the agrofood sector) and ACDI-VOCA (American NGO), in addition to Mercy Corp, CHF (two American NGOs) organisations which promoted as well organic farming programs etc…
Furthermore, the involvement of the stakeholders and private sector is often translated into collaborative or participatory process during the development of strategies and action plans as in the case of the National Action Plan (NAP) for the UNCCD that was prepared by the Ministry of Environment in February 2003 during a participatory process. It included all relevant and active stakeholders representing all sectors, public, private, civil society and academia.
Lebanon recently initiated a reform process that relies on private sector participation and includes a 10-year national strategy to meet water demand by building a series of dams and lakes to store surplus winter water, the promotion of drinking and irrigation water projects, and confrontation of wastewater and water quality problems (MEW, 1999; Comair, 2005).
Furthermore, some studies were undertaken in relation to sustainable use of forest biodiversity by private institutions for example within the frame of the bio- prospection project at AUB and through the initiatives of some private NGOs. In addition, Ammiq wetlands is a private property managed by an NGO but was managed in collaboration with the Ministry of Environment and its management plan was developed in full partnership and collaboration with the Ministry within the context of the "MedWETCoast" project.

4.3. Section C: Conclusions

4.3.1. Overall assessment of implementation of the CBD:

In general, the many areas of biodiversity conservation, sustainable use and management in Lebanon witnessed a significant progress at least since the preparation of the NBSAP in 1998. The actions of the latter and those of its draft addendum in 2005 are satisfactorily linked to and serving the 2010 Target and the related global goals and targets as well as the goals and objectives of the Strategic Plan of the Convention. However, more improvement and actions at national level are needed to achieve progress towards the global targets.

Lebanon has achieved certain results after a period of implementing the CBD through performing national actions that contribute to the biodiversity conservation and sustainable use mainly:

- The ratification of the Law on the Protection of Environment (Law 444/02) and the Law of Hunting (Law 580/04) and the preparation of the draft law regulating access to and benefit sharing of biological and genetic resources of Lebanon, draft framework law for protected areas, draft EIA and SEA decrees, and the draft biosafety decree that was developed based on the NBF. Other legislations were promptly promulgated in respect to biodiversity conservation.
- The considerable increase in the number of protected areas of different categories (8 natural reserves, 3 biosphere reserves, 16 protected forests, 16 protected natural sites/landscapes, 4 Ramsar sites, 5 World heritage site, 15 IBAs). With the exception of the natural reserves, all other protected areas are in need of a mechanism for proper management and monitoring.
- The development of major strategies and plans: National Strategy for Forest Fires, National Master Plan for land Management, National Action Plan for Protected Areas (NAPPA), National Action Plan for combating degradation and desertification, National Reforestation Plan (NRP), in addition to other National Action Plans but which need more follow-up for their adoption at national level and their implementation: National Action Plan on "Follow up of impact contamination by the hydrocarbons on the Lebanese sea environment", National Action Plan to " develop of a permanent monitoring strategies for marine and coastal biodiversity", National Action Plan on the "Updating of Lebanese legislation and development of guidelines for coastal and marine conservation", National Action Plan to "determine the physical parameters of the Lebanese marine environment", National Action Plan on "awareness campaigns for the Lebanese coastal communities and the public sector", National Action Plan to "establish a conservation strategies for coastal habitats", National Action Plan to "monitor the effect of the fuel pollution along the Lebanese coast", National Biosafety Framework and a National Strategy Framework for Sustainable Tourism. Other National Action plans are in progress of development.
- The progress of a community based nature conservation through several implementation methods but following capacities building and awareness and education campaigns. The results show the national strategy effectiveness in biodiversity conservation and management.
- The integration of environmental concepts, biodiversity conservation and sustainability into the gathering, processing and marketing of globally significant Medicinal and Aromatic Plants (MAPs) in Lebanon; into the law of hunting through the incorporation of sustainable hunting approach; into different levels of education and schools curriculum, EIA, SEA, agrobiodiversity, agriculture policy and major sectors of development. Biodiversity considerations have been indirectly linked to Climate Change impact, combating desertification, Ramsar sites and World Heritage sites.

- Agricultural development such as increases in economic plant products, organic farming, poultry, and aquacultural products has helped reduce pressures on natural exploitation, and thus protect biodiversity and aquatic communities.

The main achievements can be considered the improvement of the legal framework, *In- sit*u conservation in particular protected areas, research, training, public awareness and education and Environmental Impact Assessment in addition to the beginning of mainstreaming biodiversity conservation to certain extent into sectoral and cross sectoral plans and programs at national level but this needs further enhancement to cover all main sectors and to address specifically biodiversity components and not only the integration of environmental considerations in general.
The main difficulties are the lack of financial resources and up-to-date information, as well as the lack of specialists and opportunities for their training. Although important legislation were drafted and/or issued, the difficulty consists in the lengthy process of law endorsement as well as proper enforcement of existing legislation. The cooperation between sectors needs to be reinforced. There is also a lack of efficient coordination of both research and nature protection activities.

The only national flora and fauna studies or species inventories in Lebanon date back to 1996 (Biodiversity Country Study), all other more recent species studies are either in form of checklists limited to protected areas or specific studies conducted in some sites by single researchers. Despite the fact that the protection of the globally threatened species is considered in the Lebanese legislation, there are no studies of status and trends of the taxa at national level nor do the habitats in which the restoration of species is an integral part of conservation represent all types of ecological areas of the country. Moreover, trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socio-economic importance are in need to be identified whilst the indicators to monitor trends are far from being nationally completed. In addition, there is a major lack in studies related to alien species and alien invasive species in addition to proper mechanism for their control and monitoring and lack in alien species management plans.

In overall, the findings of the report indicates in relation to Lebanon's progress with respect to the CBD objectives, that Lebanon had many programs and initiatives in place that address the first objective of the CBD "conservation of biodiversity", the second objective "sustainable use" has started to be addressed but in specific activities and needs to receive more attention and the third objective "fair and equitable sharing of the benefits" was lacking specially in the absence of ratification of the draft "ABS" national law.

4.3.2. Lessons learned

- From the implementation of the CBD in Lebanon, it appears that any increase of the protected surface areas of particular importance for biodiversity can be considered an indicator of successful conservation when all the areas are under similar and well enforced legal status. Additional huge areas protected by Ministerial Decisions are perhaps of lesser conservation value than small protected areas declared by a Law that is of easier enforcement.
- The most important success story is the reduction of the decline of populations of species of selected taxonomic groups (*Cedrus libani*) in Tannourine Forest Nature Reserve by using pheromone regulator to control the insect "*Cephalsia tannourensis"* that was threatening the survival of the Cedars of Lebanon which are considered as the most important national heritage. This was achieved through a project financed by GEF/UNEP, executed by the American University of Beirut under the supervision of MoE. This constitutes an experience that can be beneficial to other countries in possession of Cedar trees in the Mediterranean.

- The restoration activities of the populations of the Audouin's Gull by the MoE at the Palm Nature Reserve provided encouraging results, a matter that merits dissemination for knowledge sharing.
- Lack of Incentives appeared to be discouraging researchers from updating the national lists of flora and fauna and establishing the national database, including the National Red Data Book.
- Other lessons learnt on implementation of the CBD have been mentioned in the body of the report. Key challenges that have been discussed including cross-sectoral co-ordination, the lengthy process of ratification of legislation such as the Protected Areas draft framework law and draft EIA and SEA decrees and draft "ABS" law, funding for biodiversity conservation and sustainable use and capacity constraints, while specific challenges in implementing NBSAP consists in proper monitoring of indicators.

4.3.3. Future priorities and capacity-building needs

The National Capacity Self-Assessment (NCSA) project (MOE/GEF/UNDP) determined in 2007 the national priorities for capacity development under the three UN Conventions negotiated at the 1992 Rio Earth Summit: the UN Convention on Biodiversity (UNCBD), the UN Framework Convention on Climate Change (UNFCCC), and the UN Convention on Combating Desertification (UNCCD). Accordingly, Lebanon-as a signatory to the three Rio Conventions-assessed the progress made in their implementation so far and determined the specific NCSA objectives to be:
(a) identifying capacity constraints with regard to the implementation of these Rio conventions
(b) preparing a National Strategy and Action Plan that determines the necessary mechanisms for overcoming these constraints.
One the main stages towards the realization of these objectives was the ***cross-cutting analysis*** (assessment of capacity issues, constraints and needs that cut across the three Rio conventions). This resulted in a list of national priorities regarding UNCBD, UNFCCC, and UNCCD as shown in table P below:

	Biodiversity	Climate Change	Desertification/LD
1.	Post-war biodiversity restoration, rehabilitation of natural habitats	**Promulgate a national action plan (NAP)** for GHG emissions abatement	**Integrated** ecosystem **management**
2.	Build up national biodiversity **database**	**Enacting vulnerability and adaptation measures**	**Empowerment** of traditional stakeholders
3.	**Education, awareness, and tech transfer**	**Research and systematic observation**	Develop **incentives** to involve rural community in ecosystem conservation
4.	**National policies, action plans and regulatory**	**Technology transfer**	Regional exchanges of success stories/ lessons
	measures		learned
5.	**Operationalize and implement MEAs**	**Education and public awareness**	Conservation of mountain and rural landscapes biological diversity
6.			**Accessibility of climatic information** to rural communities and training on drought mitigation

Table P. Lebanon's National Priority Issues regarding UNCBD, UNFCCC, and UNCCD

What is clear is that for further national-level implementation of the CBD, the National Biodiversity Strategy and Action plan should be updated and effectively implemented, but Lebanon currently needs more capacity and will to do so. To be successfully implemented, NBSAP require some level of political commitment, stakeholder cooperation and coordination, appropriate funding and resources, Capacity building of stakeholders to ensure needed technical, policy and analysis skills, investment in monitoring and observation networks as well as in science/policy research and clean technologies, more effective information and knowledge sharing mechanisms, aggressive communication and public awareness campaigns, intelligent environmental education programs, and the decentralization of environment and natural resource management to allow for meaningful local community participation.

Appendix 1

Information Concerning Preparation of National Report

The Fourth National Report to CBD was prepared under the GEF/UNDP project "2010 Biodiversity Targets National Assessments" executed by the Lebanese Ministry of Environment. This report was prepared by Ghassan Ramadan-Jaradi (Ph.D) and Carla Khater (Ph.D) on behalf of the executing agency, the Ministry of Environment (MoE) and in close collaboration, coordination and participation of the CBD national focal point at the Ministry of Environment, Ms. Lara Samaha (MSc.) who efficiently contributed in the development of this report.

The methodology used to prepare the Fourth National Report is tailored in response to the guidelines provided by CBD for the FNR, which recommends that in preparing their national reports, Parties involve a wide range of stakeholders in order to avoid subjective inputs by the consultant team, provide a sense of ownership of the document at the national level and to ensure a participatory and transparent approach to the reporting process.

The methodology has focused on three stages:

Stage 1: Review of all publications and documents related to CBD.
These mainly include (but not limited to):

- CBD Guidelines for the Fourth National Reports:
- http://www.cbd.int/reports/guidelines-nr-04.shtml.
- CBD Reference Manual for the Preparation of the Fourth National Report: https://www.cbd.int/nr4/.
- CBD Model Fourth National Report: https://www.cbd.int/nr4/.
- 2010 Biodiversity Target: http://www.cbd.int/2010-target/.
- Decisions of the COP Meetings mainly Dec: VIII/14 requesting Parties to prepare a Fourth National Report to the CBD with respect to the achievement of the 2010 target and goals of the Strategic Plan of the Convention and progress in implementation of NBSAPs, Dec. VI/26 (Strategic Plan for the Convention on Biological Diversity), Dec. VII/30 (Strategic Plan: future evaluation of progress) and Dec. VIII/15 (Framework for monitoring implementation of the achievement of the 2010 target and indicators of targets into the thematic programmes of work).
- Millennium Development Goals: http://www.unmilleniumproject.org/goals/index.htm
- Global Strategy for Plant Conservation: www.plants 2010.org/ (COP Dec.VI/9).
- CBD Targets and Programme of Work on Protected Areas (COP Dec.VII/28).
- CBD thematic work programmes of Work (Forest Biological Diversity, Inland Water Biological Diversity , Agriculture Biological Diversity, Marine and Coastal Biological Diversity, Dry and sub-humid lands, Mountain Ecosystem).
- CBD Cross-Cutting issues: Ecosystem Approach, Taxonomy, Climate Change and Biodiversity, Tourism and Biodiversity.
- Biological Diversity of Lebanon: Country Study Report. 1996
- NBSAP- National Biodiversity Strategy and Action plan of Lebanon and its addendum. 1998
- First National Report of Lebanon to CBD.
- Second National Report of Lebanon to CBD.
- Third National Report of Lebanon to CBD and the results of its analysis made by the CBD Analyzer.
- Thematic Reports of Lebanon to CBD.

- Lebanon State of the Environment Report (SOER).
- Lebanon National Capacity Self Assessment (NCSA): Thematic Report on Biodiversity. 2007.
- Lebanon National Capacity Self Assessment (NCSA): Cross-Cutting Synthesis Report. 2007.
- Lebanon National Capacity Self Assessment: Strategy and Action Plan for Capacity Development. 2007.
- Millennium Development Goals report for Lebanon: 2003, and any document of relevance.
- Biodiversity monitoring and indicators: Guidelines for integrating monitoring programs and indicators in projects within the NBSAP: MoE-UNDP. 2005.
- Programmes, plans and strategies related to other sectors in Lebanon that may have integrated biodiversity considerations such as those related to: desertification, agriculture, forestry, tourism, urban planning, water etc… in addition to the provisions related to SEAs, EIAs.
- Policies and legislations in Lebanon related to relevant sectors.
- *This stage (1) assisted the team in the increase of knowledge, in the reassessment process and in avoiding work duplication and subsequently waste of time.*

Stage 2: Stakeholders identification, analysis and involvement

Since the main principle of the preparation of the CBD National Reports is to adopt a participatory approach. Individuals meetings and interviews were held with the main stakeholders in the following institutions:

- Ministry of Environment
- Ministry of Agriculture
- Lebanese Agriculture Research Institution (LARI)
- National Council for Scientific Research (NCSR) including the Marine National Research Center in Batroun
- Academic Institutions developing projects and activities in biodiversity fields
- Different actors involved in current and previous international projects dealing with biodiversity (mainly Protected Areas project, SISPAM project, MedWetCoast project, Agrobiodiversity project, Biodiversity Enabling Activity projects, Biosafety project, "Mainstreaming Biodiversity Consideration into Medicinal and Aromatic Plant Production Processes in Lebanon" project and others)
- NGOs executing projects and activities in biodiversity fields
- Other government institutions or others relevant agencies which are executing activities covered by the Fourth National Report.

During this stage (2) biodiversity stakeholders and actors were identified and all biodiversity related initiatives, programmes and projects at the national level were investigated. Interviews with the above mentioned stakeholders were carried out to collect and update information about the main achievements in biodiversity since the third national report in 2005 (in terms of legislation, technical studies, implementation of activities, projects under construction, strategies under development or finalized…). Each stakeholder was consulted according to the section of the CBD National Report relevant to his field of work and expertise, through individual meetings and interviews. Such meetings helped identifying key policies and actions pertinent to major environmental and biodiversity issues. The list of the interviewed stakeholders is available in Table1 of Appendix 2.

III- Stage 3: preparation of a first draft:
Based on the literature review, stakeholders' individual meetings, and filled questionnaires, the first draft of the report was developed including the four chapters and Appendix III as per the CBD guidelines for the Fourth National Report in addition to the supporting tools and manuals provided by the CBD Secretariat, including requested information and suggested approaches.

Chapter I - Overview of Biodiversity Status, Trends and Threats. Its preparation was mainly based on the existing related literature about biodiversity status in Lebanon.

Chapter II - Current Status of National Biodiversity Strategies and Action Plans. Its preparation was based on literature review but mainly on individual meetings and interviews with stakeholders.

Chapter III - Sectoral and cross-sectoral integration or mainstreaming of biodiversity considerations. Its preparation was based on literature review but mainly on individual meetings and interviews with stakeholders.

Chapter IV - Conclusions: Progress Towards the 2010 Target and Implementation of the Strategic Plan. In this chapter, key information and findings from the previous three chapters are drawn together in order to assess how actions taken to implement the Convention at the national level have contributed to achieving progress towards the 2010 target and the goals and objectives of the Strategic Plan of the Convention.

Appendix III:
This appendix provides an opportunity to report on the implementation of the Global Strategy for Plant Conservation (adopted in COP Dec. VI/9 and reproduced in annex IV of the 4NR guidelines) and the Programme of Work on Protected Areas (adopted in COP dec. VII/28 and reproduced in annex V of the 4NR guidelines) which may not be fully covered in the four main chapters.
This appendix was prepared based on literature review and stakeholders interviews and based on information and findings from the relevant previous chapters of this report.

IV- Stage 4: Organisation of working session/workshop
Based on the first draft of the report and the identified gaps and still needed information, a workshop was held for target people to discuss the first draft and collect their comments. The workshop constituted a consultative session where small working groups were formed and consulted to complete the collection of needed information and to fill in the gaps, this session was preceded by two presentations to the participants on: 1) The format of the fourth national report and CBD guidelines 2) The methodology adopted in Lebanon to prepare the report.

The workshop was held at the Ministry of Environment premises on 23 May 2009, and it was an occasion to raise awareness about the CBD and its implementation in Lebanon on the occasion of the International Biodiversity Day which coincides on May 22.

The participants in the workshop covered the stakeholders interviewed in stage 1 in addition to key-consultants; key-informants and experts from public and private sectors or individuals. The list of the workshop participants is available in Table2 of Appendix 2.

Working paper
The first draft of the report was disseminated to the participants prior to the workshop for a better review and feedback, in addition to the following main CBD documents (in form of matrix) requested for the Fourth National Report preparation in order to familiarize the participants with the CBD provisions:

- Provisional framework of goals, targets and indicators to assess progress towards the 2010 Biodiversity Target (Annex II of the 4 NR guidelines).
- Goals and Objectives of the Strategic Plan and Provisional Indicators for assessing Progress (Annex III of the 4 NR guidelines).
- Targets of the Global Strategy for Plant Conservation Progress (Annex IV of the 4 NR guidelines).
- Goals and Targets of the Programme of Work on Protected areas (Annex V of the 4 NR guidelines).

V- Stage 5: Analysis of the workshop results and preparation of a pre-final draft of the Fourth National Report

Based on the additional information collected from the consultations during the workshop as well as the participants' comments on the draft report during and after the workshop, the gaps identified in the preliminary draft have been filled and all identified needed information have been added. A pre-final draft of the Fourth National Report has been finalized within one week after the workshop.

The preparation of the pre-final draft of the report considered all consultations undertaken, stakeholders interviewed, data collected and workshop and post-workshop feedback. After its review by MoE and UNDP, this draft has been sent to major stakeholders and actors via e-mail for a final review and for adding where necessary their final suggestions and comments. This stage was highly recommended as it ensures that the main stakeholders, actors and institutions have reviewed the pre-final draft and included their comments.

VI- Stage 6: Issuance of the final draft

Based on the result of the workshop and the internet or interview consultations, the four chapters and Appendix III of the fourth national report have been finalized followed by the preparation of the Executive Summary. In addition, Appendix I (Information concerning reporting Party and preparation of national report) and Appendix II (Further sources of information) have been completed at this stage. The final draft of the fourth national report has been finalized and submitted to MoE for final review and approval. Final comments of the Ministry of Environment have been included and the report has been submitted in its final version in English to the MoE and UNDP.

N.B: All stages of development of the report are done in close coordination with the Ministry of Environment and UNDP and following their suggestion, and under the guidance, supervision and thorough review of the Ministry of Environment.

Acknowledgement

The team members would like to extend their acknowledgment to all the institutions that provided input through the interviews or during the workshop and in particular the CNRSL for providing serious technical support.

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Appendix III
Progress towards Targets of the Global Strategy for Plant Conservation and the Programme of Work on Protected Areas

A- Progress towards Targets of the Global Strategy for Plant Conservation

Target	NBSAP goals, objectives or actions related to the target	Description of progress and main obstacles	Identified needs and future priorities
Target 1. A widely accessible working list of known plant species, as a step towards a complete world flora.	-Develop, finalize and monitor an exhaustive database for terrestrial biodiversity -Establish a database system for fresh water richness and endangered species -Compile an updated national database of local biotopes, flora and fauna in marine ecosystem. -establish a national database for crops and weeds.	The major achievement towards this target consist of: • An exhaustive list of plant species at national level in the various Lebanese ecosystems was elaborated in 1996 in the Biodiversity Country Study prepared by MoA with support of UNEP/GEF and is widely accessible through MoA website (www.agriculture.gov.lb) • Lists of plant species were elaborated in 2004 in four nature reserves in addition to a private protected wetland which is a Ramsar site (Aamiq marsh) and the five lists are widely accessible on MoE website (www.moe.gov.lb). • A book "A Thousand and One Flowers of Lebanon" (Tohme, G&H, 2002) was published by the Lebanese University in 2002 as a guide describing 1001 flower plants in Lebanon. Hard copies are in sale by the publications department of the Lebanese University with symbolic prices. • An illustrated flora of Lebanon, was published by the CNRS in 2007 as a photographic identification guide describing 2597 plants. Species descriptions include Arabic name, habitat type, description and status. Hard copies are in sale by the CNRS against reduced prices. Contact details to obtain copies are posted on: http://www.cnrs.edu.lb/Illustratedfloraoflebanon.htm • Documents and publications developed by the Lebanese Agriculture Research Institution (LARI) are available through their website (www.lari.gov.lb). • The Faculty of Sciences at Saint-Joseph University has developed in 2008 a webpage on "Virtual Flora of Lebanon" which include a list of all known plant species in Lebanon including aromatic, medicinal, endemic species and species of economic importance. The virtual flora of Lebanon accessible on http://www.fs.usj.edu.lb/flore_du_liban/ provides for each plant in the list the photos of its lifecycle, its scientific name, its common name, its geographical distribution and description of its habitat.	In order to reach at national level a thorough updated survey of the flora of Lebanon, efforts should be exerted to: -Homogenize and centralize available data in a single accepted and validated database, managed by a central research institute -Update the flora of Lebanon with detailed field surveys with a special focus of preparing a simplified key of taxonomic for genus and species. -Encourage PhD research and master thesis on flora

		• A list of coastal plant species developed by AUB-RBG Kew-University of Reading through the Darwin Initiative in 2002 was disseminated on a CD_Rom including all outputs of the project. In 2007, this study has been completed in collaboration with AUB, the Center of Plant Diversity and Systems at the University of Reading, the Royal Botanic Gardens at KEW, and the Fairchild Tropical Garden in Florida in the semi-natural coastal vegetation in Lebanon's areas of urban expansion. The results are briefed on: http://staff.aub.edu.lb/~webbultn/v8n5/article14.htm • A national database on different publications, studies and thesis related to biodiversity in Lebanon was prepared by MoE and published on the biodiversity Clearing-House (http://biodiversity.moe.gov.lb) • Different books are published by Lebanese researchers about the list of plant species in Lebanon mainly: A Thousand on One Flowers of Lebanon (Tohme, G&H, 2002) mentioned above, "The Photographic Guide to the Wild Flowers of Lebanon", *(A & N Houri, 2001), a book featuring 240 wildflowers of Lebanon. In 2007,* Houris launched a fully searchable online version of their guide at the American Lebanese University site (http://ahmad.houri.lau.edu.lb/db/). • The project "Wild Edible Plants : Promoting Dietary Diversity in Poor Communities of Lebanon" executed by the American University of Beirut which started in 2004 resulted at the end of 2007 in several original and innovative outputs, including the interactive database (www.wildedibleplants.org), five MSc and one PhD theses, the construction and costing of a healthy food basket, the creation of a Healthy Kitchen Network in three of the participating communities, academic exchanges with Canada, sub-Saharan Africa, Yemen, Jordan and Syria, two cookbooks, a food safety manual in Arabic, and a marketing strategy for Healthy Kitchens. The thesis work included an extensive ethnobotanical component that involved the identification, collection and geographic mapping of 46 plants, plus a nutritional analysis of 21 of them. The results were compiled in an interactive database that contains information on 43 wild edible plants and 38 recipes at the following website (www.wildedibleplants.org) also brochures and leaflets were produced. In addition to basic information (Arabic, English and Latin names; family; habitat; locality; seasonality; indigenous knowledge; edible portion), the database indicates the plant's active compounds and therapeutic uses (if applicable), and relevant recipes.	- Need to update a list of plant species at national level in Lebanon based on new field assessment since the last national list was elaborated in 1996 (Biodiversity Country Study) and was based on assessment of available literature.

		• A joint Project executed in 2006 between MoA, INAPG, IPIGRI-CWANA and AUF identified about 200 underutilized plant species in Lebanon and gathered for them ethnobotanical and ecological information, including data on used plant parts, type of uses, recipes, distribution, phenology, etc. The study also revealed the most diverse and the most common edible and medicinal Families in Lebanon. Experimental domestication trials contributed to better understanding of agronomic requirements however the list of species is not widely disseminated. • In addition to the information and publications relevant to the main biodiversity related projects in Lebanon executed by the various concerned organizations dealing with biodiversity: government organizations, international organizations, research institutions, universities, NGOs etc…and which are available online. Major obstacle towards this target: insufficient financial ressources and non availability of plant taxonomists for the various plant groups.	
Target 2. A preliminary assessment of the conservation status of all known plant species, at national, regional and international levels.	-Establish a database system for fresh water richness and endangered species - Assess the present status of Agrobiodiversity at national level.	• An assessment of flora was performed in five nature reserves by MoE and highlighted the importance and viability of protection in each of these sites and provided a well-documented scientific database of their natural assets and established a baseline for monitoring of key species, key habitats and progress on activities. This assessment specified the rare, endemic, threatened, invasive and noteworthy species. In addition, some localized efforts targeting specific areas of importance were done. • The project on " Conservation and sustainable use of dryland agro biodiversity in the Near east" had focused on conservation of landraces and wild relatives of important field crops, food and forage legumes and tree species. One of the main outputs of this project is assessment and monitoring of agrobiodivesity and generation of knowledge about major factors contributing to its degradation. The assessment revealed that the biodiversity in the dry areas has benefited people but there is a lot of degradation and loss, mainly because of human neglect and that there is a need to capture traditional knowledge on conservation. Major obstacle towards this target is lack of sufficient funding and non availability of a national list of threatened species.	In order to make available relevant and reliable information of the conservation status of know plant species, it is necessary to: -Secure needed funding for field data validation - Publish a red list of plants in Lebanon based on field assessment and data compilation at national level -Assessment of conservation status of all known plant species is needed at national level and not only in nature reserves and some target sites.

Target 3. Development of models with protocols for plant conservation and sustainable use, based on research and practical experience.	Lebanon has adopted the global target and has included it in the NBSAP in terms of support to activities and research projects and technical projects aiming to conserve biodiversity and promote its sustainable use, in addition to a special focus on the conservation of agro-biodiversity.	As mentioned in section B of appendix III, all existing Nature Reserves have planned and developed special guidance based on scientific research within their Management plans to ensure plant conservation and sustainable use. An ongoing project since 2004 about "Cultivation of traditionally wild medicinal and aromatic plants (zaatar (thyme) & sumac) in South Lebanon" focused on propagation and cultivation protocols for targeted species instead of random and unsustainable harvesting from the wild (typically in marginal lands) and produced booklet assessing zaatar (thyme) productivity & competitiveness in Lebanon. Information generated through research conducted by the Agrobiodiversity project was disseminated in the form of newsletter on: - Factors contributing to the degradation of agrobiodiversity. - Ways to increase the productivity and marketability of products making use of agrobiodiversity. - Impact assessment and contribution to the development of scientific basis for *in situ* conservation. The tool and technology of *in vitro* application techniques such as somatic embryogenesis were used at AUB in 2000 as they may assist in the conservation of the *Cedrus libani* species. The application of somatic embryogenesis to the Lebanese cedar is for the propagation and preservation of selected genotypes, either those from old growth provenance for use in restoration, or those with desirable commercial or horticultural characteristics. The study was published in 2000 and first posted on internet in 2004 (http://www.springerlink.com/content/k13q90807461h57r/). Development of a sustainable management plan that addresses possible threats to the ecosystem of cedar forests and means of removal of these threats was done within the project "Integrated management of cedar forests in Lebanon" funded by GEF, implemented by UNEP and executed by AUB under the supervision of the Lebanese Ministry of Environment.	There is a need to develop a central database or national clearing house mechanism that contains methodologies and protocols for conservation and sustainable use of plants. The conservation implementers are in need to access information from unpublished protocols and results from applied research. Need to develop a manual on propagation and cultivation of medicinal and aromatic plants. Need of urgent actions to document, rescue and promote plant diversity Need to develop a model on balancing sustainable use with conservation

Target 4. At least ten percent of each of the world's ecological regions effectively conserved.	NBSAP actions: - Protection of remarkable natural habitats, characterize by their ecology - Establish nature reserves and marine parks representing major eco-geographical areas - Establish nature reserves on several sites representing the major eco-geographical areas of Lebanon that have a wide diversity of naturally growing plants and animals and with as many wild relatives of agriculture crops as possible. - Expand and manage the protected areas system in terrestrial, marine and fresh water environments. Lebanon has adopted as well the global target and has included it in the National Action Plan for Protected Areas under the Activity 1: "Ecological Conservation Plan"	As the number of Nature Reserves increase from 3 in 1996 to 7 in 2002 covering mountainous and coastal ecosystems, thus the area under protection has increased from 0.13% in 1992 to 1.82 % in 2002. Since 2002, no additional declaration of Nature reserves was done. However, 3 Man and the Biosphere reserves were declared recently (Arz el Shouf and Ammiq Biosphere reserve, Jabal Moussa biosphere reserve and Jabal Rihan Biosphere Reserve) and 2 draft laws concerning nature reserves declaration in "Qamouaa" and "Jabal el Rihan" were prepared by MOE and submitted to the Council of Ministers (CoM), the draft law of Jabal el Rihan was already transmitted from the CoM to the Parliament and is in its final stage of issuance. A project aiming at the declaration of a Natural National Park in Upper Akkar is being executed by a local NGO in close collaboration with MOE. Major obstacles are related to Lack of inter-sectoral coordination, lack of financial resources	Need to expand protection over non forested areas, and other type of wooded lands. Need to vary the types of areas under protection especially that there is a number of requests being prepared to be submitted to Ministry of Environment to declare areas under protection system of "Natural Parks" which would promote conservation and integrated protection of more diverse ecosystems.

	Sub-actions 3 &4: "Surveys Ecological Units, Ecosystems and Landscapes" to "Identify Priority Areas for Conservation"		
Target 5. Protection of fifty percent of the most important areas for plant diversity assured.	NBSAP goals: To protect Lebanon's terrestrial biodiversity from degradation and ascertain their availability for environmental and economic benefits. -To conserve biodiversity under natural conditions NBSAP objectives: -Protect coastal and marine ecosystems and biodiversity -To protect the agriculture ecosystems and to maintain native biological diversity. NBSAP actions: -Protection of remarkable natural habitats, characterized by their ecology and the presence of endemic species, uniqueness… - Protection and management of the ripisylves	The Law for the Protection of Forest has designed the Ministry of Agriculture as tutelage body for the protection of fir, pine and cedar forests in Lebanon. In addition, the Ministry of Environment is the tutelage body over the nature reserves and therefore ensures protection of plant species richness including rare, endemic and threatened species included within the Nature Reserves. Lack of funding is the major obstacle to this target, and the lack of proper enforcement of the Law for the Protection of Forest and the declared protected forests under this law.	There are on-going efforts to establish more nature reserves and other types of protected areas in Lebanon thus protected areas are continuously increasing in number towards the target of 50% required.

	Lebanon has included as well this target in the National Action Plan for Protected Areas under Activity 1: "Ecological Conservation Plan" Activity 1: "Ecological Conservation Plan" Sub-actions 4: "Identify Priority Areas for Conservation"		
Target 6. At least thirty percent of production lands managed consistent with the conservation of plant diversity.	NBSAP Objectives: - To manage forests and ranges for productivity and sustainability. NBSAP actions: - Solving the problem of overgrazing: Identification and promotion of adequate fodder plants and pasture areas - Undertake scientific and technical studies to promote development and sustainable use of medicinal plants and melliferous species -Establish a forest management plan - Implement legislation for the sustainable use of natural resources.	No specific action at national level targets specifically management of productive lands in a way consistent with the conservation of biodiversity. Only pilot sites covered by the Agrobiodiversity project (LARI/GEF/UNDP.1999-2004) benefited from such oriented management as its main objective was the conservation of wild relatives and landraces of important agriculture species in Lebanon through introducing the *in-situ* or on-farm conservation mechanisms for the conservation and sustainable use of Agrobiodiversity with the direct participation of local farming and rural communities. Within the frame of the project on " Mainstreaming Biodiversity Management Considerations into Medicinal Plants Production Processes" (LARI/GEF/UNDP.2008-2012), it is planned to develop and introduce a certification system for sustainable harvesting of globally significant medicinal and aromatic wild plants in Lebanon in addition to integrating conservation objectives into the gathering, processing and marketing of these species. At the level of Nature reserves and Biosphere reserves, a process of land use and zoning mapping to define sensitive areas and research specific areas, areas for ecotourism and recreation and conservation areas as well as areas suitable for sustainable eco integrated activities where organic farming, bees hive keeping have been initiated. At IBSAR/ AUB, a project aiming to promote the use of native plant species for urban landscape as Lebanon's natural and cultural heritage has been initiated as a "seeds for hope and trees for tomorrow campaign" by planting native trees and shrubs throughout the nation's towns and villages. Many initiatives related to organic farming are being executed within the context of international funded projects and by academic institutions and NGOs or through private initiatives.	Need to develop and adopt a National Forest program aiming to enable proper sustainable management of forested areas in Lebanon. Need to develop and adopt a sustainable strategy for grazing that would enable productive management of range lands. Need to promote sustainable management of production lands in various important natural sites and for various type of production and not only in nature reserves or

	- Support research on sustainable use of resources, applied agrobiodiversity, grazing pressure on biological diversity, and encourage research on native forage crops. -Reduce excessive use of agrochemicals - Introduce sustainable harvesting into some protected areas like honey production - Establishing ecological tourism associated with public awareness and environmental education		some pilot sites targeted by specific projects and only for specific activities.
Target 7. Sixty percent of the world's threatened species conserved *In-situ*.	Lebanon has dedicated an entire section in the NBSAP related to in situ conservation.	In-situ conservation of threatened species in Lebanon is ensured for the species within the nature reserves extent which are seven nature reserves in Lebanon and which include threatened, rare and endemic plant species. Furthermore, two additional nature reserves are in process of declaration and requests for establishing further nature reserves are under review by the Ministry of Environment which will increase the *in-situ* conservation of the biodiversity including plant threatened species. The Protection of forest and forest resources Law (Law 85/ 1991), amended by the Parliament in 1996 (Law 558/ 1996) stipulates that all cedar, fir, juniper forests and "other coniferous forests" in Lebanon are protected de facto. Legal measures to protect some individual species were issued to only few target species through ministerial decisions from MoA as follows: - Ministerial Decision regulating the export of all medicinal and aromatic plants (Decision 92/1 dated 27/2/1996) - Ministerial prohibiting the picking and export of ferrula plant & roots (Decision 340/1 dated 1/8/1996)	Need to define a specific national list of threatened species to be targeted by conservation initiatives. Need to conduct a survey and establish a list of flora species in particular threatened species and calls for the establishment of plans for the protection of species in-situ and to

		- Ministerial Decision issued in 1998 regulating the harvesting of oregano and salvia (Decision 177/1) Main obstacles: - The lack of proper enforcement of the legislation regarding conservation of target species and the conservation of species in habitats/sites outside nature reserves.	establish a monitoring system to access biological and genetic resources and use them in accordance with the international conventions and agreements signed or ratified by Lebanon; as specified by the Code of Environment (Law number 444/ 2002); Article 48.
Target 8. Sixty percent of threatened plant species in accessible *Ex-situ* collections, preferably in the country of origin, and 10 percent of them included in recovery and restoration programmes	- Establish at least one botanical garden for ex-situ conservation of perennial crops including cultivated trees, annuals, biennials. - Establish a central genebank, where the different aspects of ex-situ conservation are performed via 1) survey, collection and preservation of genetic resources 2) evaluation and documentation of the collected material and 3)breeding based on clearly defined goals and objectives	A cooperation between Lebanese Agricultural Research Institute (LARI) and Kew's seed bank started in 1996 and took the aspect of an Agreement in 2000 and have been renewed in 2005 for another five years to cover the full time of the MSB Project, i.e. till 2010. Through this agreement collections of wild plants from Lebanon are transferred to Kew for storage and are being conserved as seeds and as herbaria in trust for Lebanon within the MSB (Millenium Seeds Bank) facility in Sussex, UK. The purpose of the joint project is to complement existing *in situ* conservation in Lebanon by supporting the collection, study and *ex situ* conservation of the Lebanese flora. The key outputs that are addressing this purpose are: (1) establishment of a facility to maintain a secure, vouchered, long-term seed collection of Lebanese endemic, threatened and otherwise significant plant species that is available and utilized for research and possible species recovery activities (this is now available at LARI); the project aims to collect around 50 species new to the MSB per year; (2) increased knowledge and capacity to collect and conserve seed within staff of LARI. This has been aided by the production in 2005 of a Collection Guide to rare and endangered species of Lebanon by Kew's GIS unit. And (3) to bring about an understanding within government and the broader community in Lebanon of the critical role of seed collections in an integrated approach to species and community conservation and restoration. Examples of this are the fact that conserved materials have been used in PhD research at local Lebanese universities, and that the joint Kew-LARI project features at LARI "open days" for the wider public. During the	Need to secure and make available more funds for proper implementation of initiatives carried out within the frame of international projects implemented by national institutions.

	Establish botanical gardens in cities, national parks -Establish germplasm banks, cyrofrigeration and tissue culture technologies to conserve living material Plant roadsides with endemic suitable species	remaining time of the MSB Project collecting will be increasingly targeted for endemic, threatened and economic species. Orchids and endemic species of *Iris* and *Cyclamen* are among the main target. The AUB pioneered in establishing the first and the only Seed bank in Lebanon at the University's Agricultural Research and Education Center (AREC) located in Bekaa.. Within the context of the "Agrobiodiversity" project, more than 1200 seed samples of cereal, legume, and their wild relatives, previously collected in Lebanon, were transferred by the end of June 2004 from the Seed bank of the International Center for Agricultural Research in the Dry Areas (ICARDA) to the AUB/AREC. Several herbaria exist for the preservation of plant species. These have been established at the National Council for Scientific Research, Lebanese Agricultural Research Institute, American University of Beirut and within the protected areas. The American University of Beirut is planning to establish a Mediterranean botanical garden but funds for its establishment are lacking. In addition, several local NGOs have established nurseries of indigenous plants to be used in their reforestation activities. Major Obstacles are related to the Lack of funding and the Absence of National Botanical Garden.	
Target 9. Seventy percent of the genetic diversity of crops and other major socio-economically valuable plant species conserved, and associated indigenous and local knowledge maintained	- Undertake scientific and technical studies to promote development and sustainable use of medicinal plants and melifliferous species. - Enhance the concept of integrated village developing traditional industries and other related activities associated with coastal areas such as olive oil and carob production. - Support research on	Genetic diversity of various crops and other socio-economic valuable plant species are conserved ex-situ by the Lebanese Agriculture Research Institute and in the seed bank established by the American University of Beirut and through the establishment of nurseries: - The Lebanese Agricultural Research Institute (LARI) has been involved in several initiatives related to ex-situ conservation of plant genetic resources such as the establishment of nurseries of *Origanum syriacum* and *Salvia fruticosa* in addition to grapes, almonds, and figs. - The GEF/UNDP Agrobiodiversity project (1999-2004) executed by LARI has introduced the in-situ and on-farm mechanisms for the conservation and sustainable use of Agrobiodiversity. The species targeted by the project are wild relatives and landraces varieties including cereals, forage legumes and wild fruit trees. The Project has worked with the direct participation of the local farming and rural communities and has conducted many experiments to demonstrate to the farmers the effect of seed cleaning and treatment on yield improvement in addition to several demonstration experiments for seed increase mainly for wheat and barley and the improvement of landraces in defined plots. Using	-Need to ensure a broader coverage of species and more coordinated work between concerned insitututions. -Work is needed on the use and maintenance of indigenous and local knowledge.

	sustainable use of resources, applied agrobiodiversity, grazing pressure on biological diversity, and encourage research on native forage crops. - Establish traditional farms to maintain and propagate the traditional or "heritage" varieties or breeds that are being replaced by "modern varieties" - Establish a service to facilitate the exchange of material between farms, and disseminate local or regional collection to appropriate sites. - Issue guidelines for the conservation of Agro-biodiversity -Reduce excessive use of agrochemicals through publications on integrated pest management, broad-spectrum pesticides, multiple	indigenous knowledge of the local community, the project studied the wild crops for food and medicinal purposes, surveyed several plants with possible medicinal and aromatic properties, conducted awareness campaigns and promoted the local knowledge that is associated with growing the plants or crops. - Furthermore, the Agrobiodiversity project supported a local NGO *"ARDA" in establ*ishin*g a local nurser*y for the production of around 9,000 seedlings/year of targeted wild and local varieties of fruit trees. These seedlings were distributed to the farmers and used in reforestation activities. - The Project on "Mainstreaming Biodiversity Management Considerations into Medicinal Plants Production Processes" (LARI/GEF/UNDP) focuses on 7 globally significant species of wild Medicinal and Aromatic Plants (MAPs) that are commercially traded and threatened by current harvesting practices. The project aims at integrating conservation objectives into their gathering process and to involve the local communities in their sustainable harvesting, processing and marketing in order to maintain the wild stocks of these MAPs and their long-term survival in their habitats while respecting the traditions, cultures, and livelihoods of all stakeholders. The project relies on local knowledge of therapeutic values of medicinal plants. - A study, which had been undertaken by IBSAR/AUB in collaboration the Center of Plant Diversity and Systems at the University of Reading, the Royal Botanic Gardens at KEW and the Fairchild Tropical Garden in Florida focused on examining floristic plants in the semi-natural coastal vegetation in Lebanon's areas of urban expansion, including roadsides, within a four-year plant diversity project (2008-2012) that is still ongoing. The team members are currently researching the medicinal and nutritional properties of the plants. They are also looking into the possibility of domesticating the species and are searching for new venues for conservation, such as university campuses, including AUB.	

	cropping/season, extension programmes, etc. - Support environmental and socio-economic research related to agro-biodiversity -Develop guidelines and standards for designing and implementing an agrobiodiversity monitoring network on arable land. Moreover, the Code of Environment (Law number 444/ 2002) calls under the Article 48 the Ministry of Environment to establish a surveillance system to access biological and genetic resources and use them in accordance with the international conventions and agreements signed or ratified by Lebanon.	- Within similar projects, several wild plants with potential medicinal and socio-economic value are being researched for propagation and production purposes. Private nursery owners are participating in these activities. Of these projects: The **"Promoting Cultivation of Medicinal and Aromatic Plants for Livelihood Recovery in South Lebanon (2007-08)/ UNDP-LARI",** **"**Introducing the agriculture of medicinal, aromatic and nutritional plants at Tannourine cedars, (LEB/OP3/2/06/07) (2007-10)" **and "**Medicinal plants and flowers propagation project in Aley, (LEB/SGP/OP4/Y1/CORE/2008/06) (2008-11). Furthermore, Barja Tourath Association established a nursery for endangered agricultural crops in Ikleem El-Kharoub district (LEB/OP3/2/06/05) for the production of native local plants (trees, shrubs, herbs) that are subject to extinction in the area, the Association of the Friends of the Environment is improving Kharob cultivation in southern coastal area, LEBANON (LEB/OP3/2/06/12) (2007-09), the Kharob tree is nationally and regionally threatened and is used to produce a delicious molass, the Cultural and Social Forum at Chequif is implementing the Organic olive production project at Yohmor El-Chquif, (LEB/OP3/2/06/11) (2008-11) where the farmers still rely on their traditional knowledge in agriculture. Major obstacle: - Dearth of knowledge and skills on ethnobotany and taxonomy has hindered effective conservation strategies - Lack of legislation on the protection of indigenous and local knowledge.	

Target 10. Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems.	- Exercise very close and strict conditions on introducing new species. - Apply strict regulations on imported germplasm - Encourage the use of native rather than introduced species in agriculture - Establish environmental screening procedures for importation of plant species. Ban or strictly control the import of potentially invasive species, and establish quarantine controls on all imports.	The Ministry of Agriculture has developed a list of exotic species to be banned at importation to the Lebanese customs as well as quarantines staff. However, the staff lacks proper skills to identify the species and apply the ongoing regulations. In regards to legal measures, only one ministerial decision was issued by the Minister of Agriculture to protect the native cedar tree *Cedrus lbani*: Decision 108/1, dated 12/9/1995 which prohibits the import and introduction of all cedar seeds and plants. Apart from the scientific research on algae of freshwater which discovered invasive species brought in by the feet of migrating birds, mainly the waders; the issue of invasive plant species (IPS) is still at the low national priority level. Subsequently, the IPS are not yet properly studied in Lebanon and not considered as real threat to biodiversity, most probably due to lack of awareness of the presence of IAP invading natural habitats and their impact on native flora, ecosystem functioning and the economic welfare. This explains the weakness of the country in developing the necessary regulatory measures and management plans to control the introduction and dissemination of these species. Local initiatives have not been launched to seriously address Invasive Alien Plants (IAP), neither within the scientific communities to strengthen basic and applied research nor within government agencies to develop institutional, administrative and technical capacities to control their introduction and mitigate their effects. A paper entitled “Invasive Alien Plants in Lebanon: A Neglected threat to the environment and Status of national regulatory measures” is prepared by three plant specialists from three universities and is still expected to appear in 2009. This paper will shed light on the status of IAP in the Mediterranean region while focusing on Lebanon. It will inventory potential IAP found in Lebanon, and define areas prone to IAP invasion. The authors will investigate direct and indirect regulatory measures targeting the control of IAP introduction and management and to what extent these national regulatory measures are likely to achieve the Convention on Biological Diversity framework goal of controlling IAS. Major constraints are lack of awareness of extent of problem, lack of necessary studies, lack of regulations and lack of capacity and resources to effectively develop and implement IAP programmes.	-Need to finalize and implement regulations on invasive alien species (IAS) based on scientific research identifying IAP and areas of invasion as well as to develop and run IAP programs. -Need to develop proper legislation concerning the introduction of alien species. -Need for more studies concerning alien species, and need to develop and implement monitoring and control programmes and for establishment of management plans. -Need to develop national indicators related to alien species and agree on a list of potential threats to the various ecosystems.

			-Need to adopt national strategies or plans for minimizing distribution of these species. -Need to build capacities of staff involved in handling issues related to Alien species introduction in Lebanon.
Target 11. No species of wild flora endangered by international trade.	-Exercise very close and strict conditions on introducing new species. -Investigate potential linkage with the Biotrade Initiative, the ICGB Program and other international initiatives, particularly with regards to controlling bioprospection and ensuring sustainable benefits -Establish environmental screening procedures for importation of plant species. Ban or strictly control the import of potentially invasive species, and establish	Several species of the plant families might be subject to international trade, but no official data exist. The Protection of forest and forest resources Law (Law 85 date 12/9/1991), amended (Law 558 date 24/7/96) stipulates that all cedar, fir, juniper forests and "other coniferous forests" in Lebanon are protected de facto. In addition the MoA has issued many decisions to protect some target species: - Ministerial Decision regulating the export of all medicinal and aromatic plants (Decision 92/1 dated 27/2/1996) - Ministerial Decision (Decision 108/1, dated 12/9/1995) prohibiting the import and introduction of all cedar seeds and plants - Ministerial prohibiting the picking and export of ferrula plant & roots (Decision 340/1 dated 1/8/1996) - Ministerial Decision issued in 1998 regulating the harvesting of oregano and salvia (Decision 177/1) Furthermore, species of wild flora in the nature reserves are protected from international trade. Major constraints are related to Lack of proper enforcement of relevant legislation regulating the picking and export of wild flora outside nature reserves in addition that CITES is not yet ratified by Lebanon.	Access to the Lebanese wild flora is not yet properly regulated outside nature reserves however, the MoE developed a draft law on "Access and Benefit Sharing". The implementation of this law once endorsed will regulate the access and the export of Lebanese wild flora. - Need to apply strict regulations on exported germplasm - Need to ratify CITES convention

	quarantine controls on all imports. -Apply strict regulations on imported germplasm		- Need to secure trainings for border guards and custom officers about restricted species - Need to target more individual species by national legislation to regulate their trade. - Need to protect Wild flora outside the nature reserves from international trade - Need for better enforcement of the protection of forest law and the legislation of conservation of target species

Target 12. Thirty percent of plant-based products derived from sources that are sustainably managed.	NBSAP Objectives: - To manage forests and ranges for productivity and sustainability. NBSAP actions: - Undertake scientific and technical studies to promote development and sustainable use of medicinal plants and melliferous species -Establish a forest management plan -Implement legislation for the sustainable use of natural resources. -Support research on sustainable use of resources, applied agro-biodiversity, grazing pressure on biological diversity, and encourage research on native forage crops. -Introduce sustainable harvesting into some protected areas	Area of organic farming has increased from 4000 m² in 2003 to 317000 m² in 2004 and to 450000 m² in 2005. No data available on existing amount of organic products obtained and sold. The GEF/UNDP/LARI project of "Mainstreaming Biodiversity Management Considerations into Medicinal Plants Production Processes" plans to introduce a certification system for sustainable harvesting of wild Medicinal and Aromatic plants (MAPs). The project which started in JULY 2008 (4 years project), focuses on 7 target species of wild globally significant species of MAPs that are commercially traded and threatened by current harvesting practices The project will follow the ISSC-MAP standards which provides a framework of principles and criteria that can be applied to the management of MAP species and their ecosystems, serve as a basis for monitoring and reporting on these species, and recommend requirements for certification of sustainable wild collection of MAP resources. This would help ensure the long-term survival of MAP populations in their habitats. Management plans were developed to three pilot forest sites covering a surface of 3000 hectares. Main constraints are faced in agriculture sector where intensive farming is developing with lack of enough incentives to ensure biologically friendly development of agriculture. Marketing agricultural products is one of the key problems facing farmers in Lebanon. Although Lebanon has joined several regional and international trade agreements, the role of trade in Sustainable Land Management (SLM) is still not considered in all government trade policies and agreements. This is also because SLM itself is unfortunately not receiving the proper attention it deserves by the government.	-Secure better linkage with management of the species harvested and the management of production areas through an ecosystem based approach to management. -Guaranty the application of the Code of Environment (law number 444/2002), especially its paragraph "g" of the Article 48 (contribution of the nationals and the public and private sectors to the conservation of biodiversity and the sustainable use of the natural resources).

Target 13. The decline of plant resources, and associated indigenous and local knowledge, innovations and practices that support sustainable livelihoods, local food security and health care, halted.	- Undertake scientific and technical studies to promote development and sustainable use of medicinal plants and melifliferous species. - Choose the optimal criteria for forest trees (age and diameter) for a sustainable use. - Solving the problem of overgrazing: identification and promotion of adequate fodder plants and pasture areas. - Enhance the concept of integrated village developing traditional industries and other related activities associated with coastal areas such as olive oil and carob production. - Implement legislation for the sustainable use of natural resources. - Support research on sustainable use of resources, applied agro-biodiversity, grazing pressure on biological diversity, and encourage research on native forage crops.	Within the framework of **Bioprospection**, AUB/IBSAR conducted in 2008 collaborative research and biodiversity mapping in collaboration with Costa Rica. In the near past (2001-2006) AUB collaborated with Ohio state for the same aim that rely on collaborative research, using biotechnology, to generate new plant-derived commercial products from indigenous Lebanese plants (biodiversity). The purpose is to diversify the agro-industrial portfolio in Lebanon, promote sustainable agro-industrial growth in rural communities, identify a short list of key plant species with potential medicinal, bioactive, and/or ornamental value, assess their potential markets and initiate their production. However, it is too early to assess the impact of bioprospection over the trends of natural and native resources in Lebanon, especially in absence of monitoring programme or protocol. The MoE drafted the Law of **Access and Benefit sharing** in 2005 and still awaiting for its issuance which will lead to the regulation of the access to the Lebanese biological and genetic resources and will halt the decline of wild species from unregulated consumption. Although the ABS law is not endorsed yet, the Agreement between LARI and Kew Garden within the context of the Millennium Seed Bank (MSB) project considered the principles of ABS since 2000 when seeds of wild plants were collected from Lebanon and transferred and stored in trust for Lebanon within the MSB facility in Sussex, UK. This Agreement has certainly reduced the erosion of genetic plant resources (through storage) and associated **local and indigenous knowledge** (through documentation and experimentation). Investment in local knowledge is remarkably increasing in the country, especially within projects on medicinal and aromatic plant species. This became obvious in recent years, mainly when IBSAR has partnered with foreign schools like the University of Helsinki	- Need to adopt measures at national level to conserve the indigenous and local Knowledge related to plant resources. -Need to secure a broader coverage of species and more coordinated work. -Lessons should be drawn from the failed expansion of alternative crops promoted at the expense of rich local agro-biodiversity. -Accelerate of the endorsement of the ABS draft Law. -Need to target more individual plant species of socio-economic importance by national legislation to regulate their harvesting and use -Need of proper enforcement of existing legislation regulating the exploitation of

	- Establish traditional farms to maintain and propagate the traditional or "heritage" varieties or breeds that are being replaced by "modern varieties" - Establish a service to facilitate the exchange of material between farms, and disseminate local or regional collection to appropriate sites. - Issue guidelines for the conservation of Agro-biodiversity - Reduce excessive use of agrochemicals through publications on integrated pest management, broad-spectrum pesticides, multiple cropping/ season, extension programmes, etc... - Develop an education campaign on biodiversity conservation, to increase public awareness of the threats to agro-biodiversity. - Develop a framework to assess the potential impact of agrochemical on biodiversity, and to identify the	and the University of Toledo to invest on traditional knowledge with up-to-date research and biotechnology, in an effort to explore the bioactive and medicinal properties of native species. It also works to monitor and conserve Lebanon's biodiversity and promote sustainable uses of biodiversity. In order to reduce the impact of grazing on and to halt the decline of natural plant resources while at the same time safeguarding valuable local livestock breeds, the Agrobiodiversity project promoted, since its initiation in Lebanon in 2000, the establishment of fattening units beside others in an attempt to decrease pressure on the degraded rangeland while increasing the income of the herders. Also, the Agrobiodiversity project drafted appropriate policies and legislation reforms aiming at halting plants decline mainly wild relatives and landraces. . Moreover, the project has highlighted activities and actions that contribute to the ultimate goal of improving the livelihood of local communities while conserving agrobiodiversity, but increased national and international support is needed to conserve endangered agrobiodiversity. Genetic diversity of various crops and other socio-economic valuable plant species are conserved ex-situ by the Lebanese Agriculture Research Institute and in the seed bank established by the American University of Beirut and through the establishment of nurseries. Furthermore, Lebanon is blessed with a great diversity of edible wild plants. Harvesting and use of these plants is on the decline due to loss of traditional knowledge, environmental degradation and displacement by modern agricultural practices (monoculture, pesticides). The project "Wild Edible Plants : Promoting Dietary Diversity in Poor Communities of Lebanon" executed by the American University of Beirut from 2004 till 2007, promotes the use of diversified wild edible plants and local food systems in order to combat the plant decline and the diseases associated with simplified diets.	forest resources and the exploitation of specific target plant species of economic importance

	levels of biodiversity that are likely to be affected. -Develop incentives, taxation and penalties (in relation to agro-biodiversity) -Develop a better understanding of the impacts of the loss of genetic variability of agro-biodiversity due to chemical stress - Support environmental and socio-economic research related to agro-biodiversity -Develop guidelines and standards for designing and implementing an agro-biodiversity-monitoring network on arable land.	The GEF/UNDP project on "Mainstreaming Biodiversity Management Considerations into Medicinal Plants Production Processes" (2008-2012) implemented by LARI has focused on the involvement of local communities in the process of sustainable harvesting, processing and marketing of 7 target species of wild significant Medicinal and Aromatic Plants (MAPs) that are commercially traded and threatened by current harvesting practices, The project aims at integrating conservation objectives into the gathering process in order to maintain the wild stocks of these MAPs. The project follows the ISSC-MAP standards in which the principle 4 states that local communities' and indigenous people customary rights to use and manage collection areas and wild collected medicinal and aromatic plants (MAPs) resources shall be recognized and respected. The Criterion 4.2 focuses on Benefit Sharing and states that Agreements with local communities and indigenous people are based on appropriate and adequate knowledge of MAP resource tenure, management requirements, and value. The project plans to introduce a certification system for sustainable harvesting of MAPs, this would halt the decline of the MAP species and help ensure their long-term survival in their habitats while respecting the traditions, cultures, and livelihoods of all stakeholders. Thus, the project encourages local manufacturing companies interested in applying for the certification process of sustainable harvesting, production and distribution of the selected target wild MAPs species and the project is now in the process of identifying target communities where the small enterprises would be established. Major constraints are • Lengthy time taken to endorse Laws especially with regards to ABS. • Overharvesting of medicinal, aromatic and culinary plants. • The lack of legal measures addressing indigenous and local knowledge	

Target 14. The importance of plant diversity and the need for its conservation incorporated into communication, educational and public-awareness programmes.	-Develop training programmes and awareness campaigns, particularly as regards to the importance of conservation of biodiversity. -Implement environmental education in schools. - Develop an education campaign on biodiversity conservation, to increase public awareness of the threats to agrobiodiversiy	All the international funded projects related to biodiversity which are implemented by the relevant government institutions in Lebanon mainly CNRS, MoE, MoA and LARI include components related to public awareness about the importance of biodiversity and the need for its conservation. Plant diversity was integrated at a large extent within the public-awareness programmes related to these projects. Furthermore, local NGOs undertake various initiatives to integrate biodiversity conservation in their awareness programmes. In relation to communication, Internet-based information are very efficient in the concerned government institutions dealing with biodiversity issues: the Ministry of Environment's site (http://www.moe.gov.lb) , the Ministry of Agriculture's site (http://www.agriculture.gov.lb), the Lebanese Agriculture Research Institution (LARI) site: (http://www.Lari.gov.lb), the National Center for Scientific Research site: (http:// www.cnrs.edu.lb); The National Center for Marine Research site: (http://bihar@cnrs.edu.lb) which play an important role in disseminating information, publications, studies and various outputs of different activities and projects carried out by these institutions including those related to plant diversity. In relation to education, the NCSR is one of the major public institutions granting fellowships to Lebanese students to carry out higher studies (Ph.D) related to biodiversity and sustainable development. Communication: The Ministry of Environment has established the national biodiversity and biosafety clearing-house http://biodiversity.moe.gov.lb, http://biosafety.moe.gov.lb) which promote communication about various issues related to biodiversity and biosafety.	-Need to increase scope and effectiveness of environmental education, outreach and awareness raising initiatives. -Need to measure and evaluate effectiveness of programmes -Education and public awareness activities about conservation and sustainable use of biodiversity should be sustained in order to prevent overexploitation of ecosystem capacity.

		A national database on biodiversity publications, thesis, and national institutions dealing with biodiversity was developed and posted on the Lebanese biodiversity clearing-house which is linked to the MoE website, CBD clearing-house and other sites of interest. Public-awareness: The Service of Guidance and Awareness at the MoE is continuously organizing workshops and awareness campaign related to various environmental topics among them biodiversity. The Service prepares as well many awareness materials (posters, booklets, brochures etc..) and disseminates them to the different stakeholders. Education: Environmental concepts were integrated within the school curricula into the various disciplines in 1998 based on an "***Environmental Education Study***" in Lebanon" which has been prepared in 1998 by the Centre du Development et du Recherche Pedagogique (CDRP)" /Ministry of Education in collaboration with the Ministry of Environment, UNDP, UNICEF, UNESCO and WHO. It mainly aims at acquiring students values related to the respect of natural resources of Lebanon and its natural environment and shifted from teaching ecology only in sciences courses into integrating the environmental education into the various courses within the school curricula. The Agrobiodiversity project (LARI, UNDP,GEF) (1999-2005) has provided four scholarships to students to carry out higher studies related to agrobiodiversity, the Tannourine project (MOE/UNEP/GEF) will provide as well four scholarships to students to continue a Masters degree in biodiversity field. Moreover, the project assessed the status of the local schools and education in general in target areas. The study included recommendations for interventions and activities with the aim of improving the awareness of the local communities on the importance of	

		biodiversity and covered as well a general review of the national education programs with reference to the importance given to the preservation of the environment in general and biodiversity in particular. In this regard, the Agrobiodiversity Project conducted several training sessions for teachers and students from the Project Sites to increase their knowledge on the different issues stressing on Agrobiodiversity. The training sessions covered the following topics: Main global and national environmental problems, ecosystems, biodiversity richness of Lebanon, agrobiodiversity, establishment of school environmental clubs and conducting extracurricular activities, environmental education and teaching methodologies. The Project also developed a curriculum guide, which proposes the integration of the biodiversity concepts into the education curricula (Arabic version available at the project website). The guide includes the matrix of biodiversity concepts and the incorporation of these concepts through the different courses and classes of the Lebanese education curricula. Obstacle: There is lack of coordination among the various stakeholders regarding implementation of environmental education and awareness programmes	

Target 15. The number of trained people working with appropriate facilities in plant conservation increased, according to national needs, to achieve the targets of this Strategy.	- Develop training programmes and awareness campaigns, particularly as regards to the importance of conservation of biodiversity. - Develop agro-biodiversity extension programs and training centers. - Recruit locals to work on site in the protected areas and provide suitable training.	Several national and regional training sessions, workshops and thematic meetings are conducted by the various projects related to either agrobiodiversity and in-situ conservation and management of protected areas. Training was also provided through initiatives undertaken by local NGOs and academic institutions. Several trainings for local communities, farmers and researchers on integrated pest management, organic farming, orchard management practices, water harvesting techniques, GIS applications for management of Agrobiodiversity, quality seed production, proper and safe use of pesticides, soil and water resources management, plant taxonomy, management of NGOs, land tenure and nature resources management, improved apiculture techniques, agro-food processing, in-situ conservation, importance of plant genetic resources in sustainable agriculture, establishment and management of fruit trees nurseries, pasture and pasture nursery management have been performed. More than 800 individuals have benefited from those trainings in addition the project supported around 20 researchers and 10 farmers to attend many trainings provided at the regional level. Many trainings and capacity building programmes were undertaken by the Protected areas project (PAP) and the MedWetCoast project for the Protected Areas management teams on: Protected Areas Management, flora Monitoring and plant species identification, Protected Areas Visitor Management, collaborative management , Ecotourism in Protected Areas, natural and Cultural Heritage Interpretation and Evaluation in addition to capacity building in plant taxonomy which covered the development of local herbaria, with the basic techniques and practices for their establishment provided through training workshop and weekly follow up visits to the nature reserves. Under the MedWetCoast project, training of women in the project sites has been done on organic/agro-food to be sold in the community-owned shop,	Need to sustain the trainings and workshops and to monitor progress of trained persons in order to ensure sustainability of acquired skills.

		eco-guide training program was conducted to train people from the local community to become guides in the protected areas and training to all protected areas management teams and committees and concerned ministries about management planning. In addition, the project has developed a training program to improve the management of Tyre Coast coast nature reserve which is one the project's sites. At the present 75% of this plan has been implemented. Within the frame of the Medicinal plants project, trainings are planned for MAP collectors on species identification and sustainable harvesting techniques. Within the national campaign on forest fires executed by MoE and a local NGO (AFDC), many trainings were organized to the Civil Defense officials, forest guards of the Ministry of Agriculture, the Lebanese Army and the Internal Security Forces officials on: Forest Fires combating techniques, incident command system and Forest Fires investigation. In addition, training was provided to volunteers from the local communities about forest fires combating techniques and awareness sessions to the farmers about forest fires prevention. Furthermore, trainings sessions are conducted by the academic institutions and concerned NGOs about plant identification and plant taxonomy. Major obstacle is related to Lack of funding.	

Target 16. Networks for plant conservation activities established or strengthened at national, regional and international levels.	- Organize a network of observation stations for marine biodiversity centered around the "National Center for Marine Sciences" or "The National Center of Scientific Research (NSCR)", and assist in the rehabilitation of research centers in general. - Develop guidelines and standards for designing and implementing a agro-biodiversity-monitoring network on arable land.	There is no network designed exactly for plant conservation in Lebanon. However, the Communication networks are covered by the MoE homepage and will be promoted through the biodiversity clearing-house which is operational under the MoE homepage. Major constraints related to Lack of funding and coordination	Need to improve communication and to activate effective network for plant conservation at national level.

B:Progress towards Targets and Goals of the Programme of Work on Protected Areas

Goal, Target			National Agendas & policy tools	Description of progress and main obstacles
PROGRAMME ELEMENT 1 **Direct actions for planning, selecting, establishing strengthening, and managing, protected area systems and sites**	**Goal 1.1** **To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals**	• By 2010, terrestrially [1]/ and 2012 in the marine area, a global network of comprehensive , representative and effectively managed national and regional protected area system is established as a contribution to (i) the goal of the Strategic Plan of the Convention and the World Summit on Sustainable Development of achieving a significant reduction in the rate of biodiversity loss by 2010; (ii) the Millennium Development Goals – particularly goal 7 on ensuring environmental sustainability; and (iii) the Global Strategy for Plant Conservation	As part of the National Action Plan for Protected Areas (NAPPA) prepared by the Ministry of Environment in 2006, a specific activity has been dedicated to the identification of key ecological areas to be included in the Protected Areas network. The NAPPA is organized into nine activities: 1. Ecological Conservation Plan 2. New Protected Areas Category System 3. Institutional Framework for Protected Area Management 4. Capacity Building for Protected Area Management 5. Effective Management of Protected Areas 6. Sustainable Financial Strategy for Protected Area Management 7. Public Awareness & Communication Strategy 8. Ecotourism Promotion & Visitor Management 9. NAPPA Law Program The NAPPA aims to organize and streamline policies and programs related to protected area management in Lebanon over 5-year time horizon (2007-2011). It contributes to achieving global milestones including the CBD 2010 goals and targets. • The Ministry of Environment has suggested a new category system for Protected Areas that includes 4 categories inspired from the UNEP/ IUCN system. This new system is being fine tuned in order to better fit the natural ecosystems in Lebanon. The categories include: Category A: habitat species management area; Category B: National Parks; Category C: Natural monuments Category D: Protected Landscape/Seascape	• A draft law program for securing funds from the public treasury to proper implementation of all activities foreseen in the NAPPA, has been prepared but was not forwarded to be endorsed yet. • The draft law should be soon submitted to the Council of Ministers and the Lebanese parliament in order to be approved. • At present eight nature reserves are declared in Lebanon: six terrestrial forest nature reserves, one marine and one coastal. • Aiming to increase area under protection, the Ministry of Environment has prepared the legal text for the declaration of two additional nature reserves. • 3 sites were declared as biosphere reserves as per the UNESCO designation: 1) Shouf Biosphere Reserve with Ammiq wetland 2) Jabal Moussa and 3)Jabal el Rihan. • A project related to the declaration of a Natural Park in upper Akkar/Qammoua area has been submitted to the Ministry of Environment and is being closely followed up and monitored prior to acceptance and designation Main challenges: - Securing adequate funding for implementation of the different activities. -Lenghty process for the endorsement of the proposed new legislation related to the Protected Areas.

[1]/ Terrestrial includes inland water ecosystems.

Goal, Target			National Agenda & Policy tool	Description of progress and main obstacles
	Goal 1.1 (Continued) **To establish and strengthen national a nd regional systems of protected areas integrated into a global network as a contribution to globally agreed goals**	By 2010, terrestrially [2]/ and 2012 in the marine area, a global network of comprehensive, representative and effectively managed national and regional protected area system is established as a contribution to (i) the goal of the Strategic Plan of the Convention and the World Summit on Sustainable Development of achieving a significant reduction in the rate of biodiversity loss by 2010; (ii) the Millennium Development Goals – particularly goal 7 on ensuring environmental sustainability; and (iii) the Global Strategy for Plant Conservation	Conduction of national-level review of the existing and potential forms of conservation. All kind of National ecosystems are covered by the new PAs System. Within the proposed National PAs category system for Lebanon, one subcategory under Category D "Protected Landscapes/Seascape", was also envisaged, the *Hima System* which is a community-based sustainable managed Protected Area. A *Hima* is a Protected Area managed mainly through the sustainable use of natural resources, and to meet the requirements of specific species of National/Regional/or International importance. This is implemented through active management intervention, to ensure long-term protection and maintenance of biological diversity while also providing a sustainable flow of natural products and services to meet community needs. MOE has initiated a project in collaboration with IUCN and with kind funding from Spanish Government about "Supporting the Management of Important Marine Habitats and Species of Lebanon" which aims to declare at least 2 marine protected areas within its 2 year work plan. MOE is currently in process of finalizing a project under UNEP /GEF RAF IV regarding "Policy and Legislative Development for mainstreaming the sustainable management of marine and coastal ecosystems in Lebanon" which aims to undertake an ecological survey and assessment of the Lebanese coast for a better informed management.	▪ With respect to the marine and inland water ecosystems in existing national and regional systems of protected areas; to date, it exists: – One marine ecosystem, the Palm Islands, is declared as Nature Reserve by law. The current management targets only the terrestrial part. – One coastal ecosystem declared as Nature Reserve by law: Tyre Coast Nature Reserve – Many River Streams are declared as Nature Sites under the protection of the Ministry of Environment through ministerial decisions from the Minister of Environment, but no actions for on site management are being done and their status of protection is different than the nature reserves.4 Ramsar sites are declared. – 5 Himas are declared by local authorities and additional 2 are in the process of being approved by local authorities.

[2]/ Terrestrial includes inland water ecosystems.

Goal, Target			National Agenda & Policy tool	Description of progress and main obstacles
	Goal 1.2 **To integrate protected areas into broader land- and seascapes and sectors so as maintain ecological structure and function**	• By 2015, all protected areas and protected area systems are integrated into the wider land- and seascape, and relevant sectors, by applying the ecosystem approach and taking into account ecological connectivity [5]/ and the concept, where appropriate, of ecological networks.	▪ The Strategic Environmental Assessment (SEA) was identified as a practical tool for environmental planning and decision-support tool for improving and for the integration of protected areas into broader land- and seascapes. ▪ Definition of Buffer zones around each protected area where ecologically sustainable practices are encouraged and threaten practices are prevented ▪ The Shéma Directeur de l'Aménagement du Territoire Libanais (SDATL) "National Master Plan for Land Management in Lebanon" considered as a tool of ecological connectivity, was nationally approved by decision of Council of Ministers on 26 February 2009. ▪ The growing declaration of Biosphere reserves which include beside the core area, other zones that may extend beyond the buffer zone is step towards ecological networks and ecological connectivity (Al Shouf Biosphere Reserve; Jabal Al Rihane Biosphere Reserve)	▪ SEA shave been performed at national level on sites concerned with or including protected areas. MOE in collaboration with the DGUP had executed one SEA case study on the integration of a Nature Site protected under MoE (Baatara Sinkhole) within the regional Master Plan of the hole area, taking into consideration ecological aspect and natural features conservation. This Master Plan was designed upon the recommendation of the SEA study and was approved by the Higher Council of Urban Planning. Buffer zones are established around each protected area. ▪ Another SEA has been done to Jounieh Gulf area where proposals for the design and use of Jounieh Gulf were discussed; however, it was not approved to date by MOE, due to its incompliance with environmental guidelines. ▪ It is also important to mention another SEA undertaken to the project Lebanon Mountain Trail (LMT) which crosses all over the country in PAs, Natural Sites, agricultural areas and other areas as an eco-touristic project that also links ecosystems.

[5]/ The concept of connectivity may not be applicable to all Parties.

Goal, Target			National Agenda & Policy tool	Description of progress and main obstacles
	Goal 1.3 **To establish and strengthen regional networks, transboundary protected areas (TBPAs) and collaboration between neighbouring protected areas across national boundaries**	Establish and strengthen by 2010/2012 [6]/ transboundary protected areas, other forms of collaboration between neighboring protected areas across national boundaries and regional networks, to enhance the conservation and sustainable use of biological diversity, implementing the ecosystem approach, and improving international cooperation	The project initiated by MOE /IUCN will consider the establishment of PAs around the Northern and Southern Lebanese borders in areas previously assessed for their biological diversity and sensitivity i.e Naqoura at the Southern border and Shikh Zeinad at the Northern border of Lebanon.	Currently, there are no transboundary protected areas (TBPAs) In Lebanon, however 2 boundary protected areas are planned which will require coordination and collaboration with neighboring countries.

[6]/ References to marine protected area networks to be consistent with the target in the WSSD plan of implementation.

Goal, Target			National Agenda & Policy tool	Description of progress and main obstacles
	Goal 1.4 **To substantially improve site-based protected area planning and management**	▪ All protected areas to have effective management in existence by 2012, using participatory and science-based site planning processes that incorporate clear biodiversity objectives, targets, management strategies and monitoring programmes, drawing upon existing methodologies and a long-term management plan with active stakeholder involvement	The Lebanese Protected Areas are managed through a Participatory approach and co-management. The governance model of the Lebanese Protected Areas, as stated in each PA Law, constitutes of volunteers in a committee appointed by the Minister of Environment. The Appointed Protected Area Committee (APAC) is responsible for decision-making and achieving the objectives of the management of the site. The committees represent the local communities (municipalities, district commissions), University experts, environmental NGOs, or representatives of institutions (Ministry of Agriculture). Aiming to reach a stable institutional structure for Protected Areas management in Lebanon, the Ministry of Environment has implemented in collaboration with UNDP between 2004 and 2006 an EU funded project which have developed a set of policy tools to achieve effective Protected Areas management as follows: ▪ Detailed Terms of Reference for the Protected Areas Committees and Management Teams members ▪ Policies and Procedures for proper management of Pas	A Management Team exists for each Nature Reserve and is hired upon detailed TORs prepared by the MOE with preference given to local communities. The Appointed Protected Area Committee (APAC) is responsible for the supervision of the management of each Protected Area and forms the link between the MOE and the Management Team, whereby it works in close collaboration with both parties. The new terms of Reference for proper PA management were ready since 2006, and since 2006 they were followed as guidelines for eventual recruitment and in order to guide and orient daily activities. Those TORs were drafted into a decree but the decree has not yet been processed into official channels to be endorsed. The Policies and Procedures that were designed to be included in the PAMIS are being requested by MOE in the different Nature Reserves, however, the PAMIS execution is still pending, awaiting availability of funds to be effectively developed, as the book of specifications is ready. The draft general framework law for Nature reserves in Lebanon which is actually in its 7th draft and should be soon submitted to Council of Ministers and then to Parliament, has dedicated a specific section dealing with job security of management teams in the overall objective of securing a more stable management for PAs. Currently. 3 PAs have an outdated management plan and are in the process of renewing it while 2 PAs have new management plans which they being implemented. However, 2 PAs lack to date a management plan Currently, 3 PAs have monitoring plans for ecological monitoring while 2 PAs are in the process of updating their monitoring plans. In addition, one protected area has a business plan while 3 others have an outdated business plan that needs to be updated. Main obstacles: Availability of funds for optimum implementation and lengthy process for the issuance of the PA draft framework law.

Goal, Target			National Agenda & Policy tool	Description of progress and main obstacles
	Goal 1.4 (Continued) **To substantially improve site-based protected area planning and management**	▪ All protected areas to have effective management in existence by 2012, using participatory and science-based site planning processes that incorporate clear biodiversity objectives, targets, management strategies and monitoring programmes, drawing upon existing methodologies and a long-term management plan with active stakeholder involvement	▪ An integrated Mangement System for Protected Areas Management Information System (PAMIS). ▪ A National Action Plan for Protected Areas NAPPA. The NAPPA is organized into nine activities: - Ecological Conservation Plan - New Protected Areas Category System - Institutional Framework for Protected Area Management - Capacity Building for Protected Area Management - Effective Management of Protected Areas - Sustainable Financial Strategy for Protected Area Management - Public Awareness & Communication Strategy - Ecotourism Promotion & Visitor Management - NAPPA Law Program	

Goal, Target			National Agenda & Policy tool	Description of progress and main obstacles
	Goal 1.5 **To prevent and mitigate the negative impacts of key threats to protected areas**	By 2008, effective mechanisms for identifying and preventing, and/or mitigating the negative impacts of key threats to protected areas are in place.	Effective mechanisms to identify, prevent and mitigate negative effects of key threats to protected areas were included in several law texts applied in Lebanon and specifically: ▪ The code of the Environment – Law 444/2002, refers to (1) The conduction of EIAs and/or SEAs for the integration of protected areas into broader land- and seascapes; ▪ Human activities threatening the PA such as grazing, logging, trespassing into conservation areas are prohibited in each PA's law In addition to the following measures: ▪ Major infrastructure and industrial project in the surrounding of the nature reserves as well as plans must be subject to impact assessment studies ▪ During Management planning process, threats assessment is mandatory as well as the inclusion of relevant mitigation measures.	▪ Key threats were assessed during the process of Management Planning preparation for Tyre Coast Nature Reserve (prepared in 2006) and Ammiq Wetland (prepared in 2006) as well as Tannourine Cedar forest Nature Reserve (prepared in 2007) and relevant mitigation measures were included in the management plans. ▪ The other Nature reserves are in the process of updating their management plans therefore assessing the threats in order to develop new conservation strategies ▪ Any activity involving species introduction within protected Areas is prohibited by law Main obstacle: The recurrent delays to the issuance of the General framework law for Protected Areas as well as of the operational decrees of Law 444 that stipulates the right to penalize violators, to collect fines and issue citations upon violations.

Goal, Target			National Agenda & Policy tools	Description of progress and main obstacles
PROGRAMME ELEMENT 2 **GOERNANCE, PARTICIPATION, EQUITY AND BENEFIT SHARING**	**Goal 2.1** **To promote equity and benefit-sharing**	Establish by 2008 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas	Equitable benefit and cost sharing for management of protected areas in Lebanon are achieved by means of the following policies and tools: ■ Business Plans are requested for each PA in order to reach sustainable financing and equitably share benefits with local communities where appropriate. ▪ Management plans for protected areas include as core activity the provision of alternative business opportunities for local communities through encouraging bed and breakfast, local produce selling, summer activities…. as part of the Rural Development program. In addition management plans are conceived to involve as much as possible the local community in the management of the PAs.	■ MoE, within both GEF/PAP and FFEM/MedWetCoast projects, prepared 5 Business Plans for 5 different sites; where the socio-economical aspect of each area was assessed and analyzed in order to reach sustainable financing for these sites and compensate costs and equitable share benefits with local communities where appropriate ■ The management of the Protected Areas involves cost sharing between the Ministry of Environment and external funders to cover the running costs of the daily activities. Only in one reserve (Tyre Coast Nature Reserve), the municipality rent the touristic sector and the revenue is provided to the Appointed Protected Areas Committee (APAC) which is responsible of the supervision of the management of the reserve. ▪ Benefit -sharing arising from the establishment and management of protected areas is mainly related to income generating activities. Within each PA management plan, emphasis was made to promote income generating activities and small entrepreneur initiatives that involve local communities within the context of Rural Development programmes. Many activities and initiatives were already been undertaken such as marketing of products (traditional food, handicrafts and artisanal products etc.) produced by the local communities surround the reserves, application of organic farming in some nature reserves to demonstrate to the farmers the techniques and benefits of organic farming, promotion of ecoutourism activities in the reserves and bed & breakfast in the local communities locations surrounding the reserves in addition to organization of eco-guide training program for locals, programmes related to beekeeping and honey production in some nature reserves in addition to training program for locals on the sustainable consumption of Medicinal and Aromatic Plants (MAPs) surrounding the reserves to generate MAPs based products.

Goal, Target			National Agenda & Policy tools	Description of progress and main obstacles
PROGRAMME ELEMENT 2 GOVERNANCE, PARTICIPATION, EQUITY AND BENEFIT SHARING	**Goal 2.1 (Continued) To promote equity and benefit-sharing**	Establish by 2008 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas	▪ Sustainable use areas were envisaged in the draft framework law for PAs that integrate community development in accordance with PAs objectives.	Main obstacle: The lengthy process of the issuance of the protected areas draft framework law which envisaged a zone of sustainable use in the protected areas in addition to the endorsement of the "Access and Benefit Sharing" draft law which regulates the access of the Lebanese biological and genetic resources in general and promotes equity and benefit-sharing.

Goal, Target			National Agenda & Policy tools	Description of progress and main obstacles
	Goal 2.2 **To enhance and secure involvement of indigenous and local communities and relevant stakeholders**	Full and effective participation by 2008, of indigenous and local communities, in full respect of their rights and recognition of their responsibilities, consistent with national law and applicable international obligations, and the participation of relevant stakeholders, in the management of existing, and the establishment and management of new, protected areas	Tools for full and effective participation of local communities in protected areas management in Lebanon include: ■ The governance model of the Lebanese Protected Areas, as stated in each PA Law, constitutes of volunteers in a committee appointed by the Minister of Environment and a management team for each PA. The Appointed Protected Area Committee (APAC) is responsible for decision-making and achieving the objectives of the management of the site. The committees represent the local communities (municipalities, district commissions), University experts, environmental NGOs, or representatives of institutions (Ministry of Agriculture). ■ The staffs of the management teams are hired upon detailed TOR prepared by the MOE with preference given to local communities applicants.	▪ Through the SISPAM Project, the PA management system in Lebanon was assessed within a report entitled" Protected Areas Management in Lebanon: Towards a Stable Institutional Management Structure" in which the management approach was reviewed on both national and international levels, taking in consideration the involvement of relevant stakeholders. ▪ As previously mentioned, the Lebanese Protected Areas are managed through a Participatory approach and co-management, as stated in each PA Law, by Committees "**Appointed Protected Area Committee" (APAC)** appointed by the Minister of Environment, and composed of volunteers of local communities, representing municipalities, academics, NGOs…etc. This committee contracts management team members from the surrounding villages. ■ The Appointed Protected Area Committee (APAC) forms the link between the MOE and the Protected Area Management Team (MT), whereby it works in close collaboration with both parties. APAC's supervises the work of the MT and ensures the proper implementation of the management plan and the budget, and reports regularly to the MOE. ■ The MoE prepared in 2006 a draft decree that states the TORs and job descriptions for Protected Areas Committees and their Management Teams, defining their role, prerogatives, and their capacity needed to perform properly their tasks and responsibilities. Knowing that even before the development of the decree, APAC was always appointed and the Management teams were always hired according to TORs prepared by MoE. ▪ Within each PA Management Plan, it was perceived to involve as much as possible the local community as part of the Rural Development programme. Many initiatives were already been undertaken such as Organic Farming, Bed& Breakfast…etc

Goal, Target			National Agenda & Policy tools	Description of progress and main obstacles
	Goal 2.2 (Continued) **To enhance and secure involvement of indigenous and local communities and relevant stakeholders**	Full and effective participation by 2008, of indigenous and local communities, in full respect of their rights and recognition of their responsibilities, consistent with national law and applicable international obligations, and the participation of relevant stakeholders, in the management of existing, and the establishment and management of new, protected areas	▪ Sustainable use areas were envisaged in the draft framework law for PAs that integrate community development in accordance with PAs objectives. ▪ The proposed National PA category system for Lebanon, envisage on subcategory: "the *Hima System*", a community-based sustainably managed Protected Area. ▪ Management plans are conceived to involve as much as possible the local community in the management of the PAs and the activities related to the PAs as part of the Rural Development program. Many income generating activities and initiatives were already been undertaken such as Organic Farming, Bed & Breakfast…etc.	▪ 3 Himas are declared by local authorities: Ebl es Saki, Qolailey and Anjar/ Kfar zabad. All are effectively operating by local community management. A project concerning a Natural park In Upper Akkar and Donnieh is being prepared and implemented by an NGO under close supervision of the MOE and aims at implementing a co management framework with strong involvement of municipalities and locals.

Goal, Target			National Agenda & Policy tools	Description of progress and main obstacles
PROGRAMME ELEMENT 3 ENABLING ACTIVITIES	**Goal 3.1 To provide an enabling policy, institutional and socio-economic environment for protected areas**	By 2008 review and revise policies as appropriate including use of social and economic valuation and incentives, to provide a supportive enabling environment for more effective establishment and management of protected areas and protected areas systems	The Ministry of Environment as tutelage body for the Protected areas in Lebanon has reviewed and revised relevant policies regarding the social and economic valuation and incentives to improve effective management of protected areas. In this perspective the following policy tools were developed: ▪ Draft general framework law for protected areas including the financial and non financial incentives to be provided to PA committees to support PA management. ▪ A yearly financial contribution from the budget of the MOE to Nature reserve for the implementation of the Management plans.	▪ Within each PA Management Plan, the legislative and institutional gaps and barriers that impede the effective establishment and management of protected areas, were identified and mitigation measures were perceived and currently in process of implementation. ▪ The MOE prepared in 2006 a Report on "Determining of a Feasible Mechanism for Sustainable Financing of Protected Areas Development and Management" which aimed to reach a sustainable financing strategy for Protected Areas in Lebanon. The report concentrated on: 1) Reporting on all mandates and accessible international and national sources of funds and their availability, 2) Assess the financial situation for each PA, 3) Assess the revenue stream and budgetary needs in the MOE budget in relation with effective management for PAs, 4) Explore potential methods for funding public PAs in Lebanon, 5) Assess the gaps and needs in the legal framework governing Pas in Lebanon, 6) Analyze and develop an administratively sound and legally defensive sustainable funding mechanisms for protected areas. ▪ It was perceived in each PA Management Plan to identify economic opportunities and markets for exploring goods and services produced by protected areas, involving as much as possible the local community, as part of the Rural Development programme. Many initiatives were already been undertaken such as Organic Farming in Tyre Coast Nature Reserve, Bed & Breakfast in Ammiq wetlands, small markets for goods (rural food & production of handcrafts and artisanal products) in Al Shouf Cedars Nature Reserve…etc. This aims at promoting equitable sharing of benefits.

				Tyre coast Nature reserve and Ammiq wetland have prepared separate Business Plans in 2005 which suggest specific measures to secure additional funding and improve the financial sustainability of PA management in Lebanon. Other Nature Reserves are in the process of developing their own Business plans.

Goal, Target			National Agenda & Policy tools	Description of progress and main obstacles
	Goal 3.2 To build capacity for the planning, establishment and management of protected areas	By 2010, comprehensive capacity-building programmes and initiatives are implemented to develop knowledge and skills at individual, community and institutional levels, and raise professional standards	As part of the SISPAM project funded by EU and implemented by the Ministry of Environment (2004- 2006) in collaboration with UNDP, and aiming to build a comprehensive capacity building program to develop relevant skills for PA management, a Detailed training needs assessment and capacity building strategy were put in place:	The training needs assessment was realized among the PA committee, the Management team staff as well as, at central level, with the PA unit in MOE. It revealed needs for capacity building on the following fields: - Reporting - Accounting - Fund raising - Income generating - Networking - Management and management planning - Internet use - Basic knowledge in biodiversity conservation - Identification and monitoring of flora and fauna - Diving and underwater photography - English and French Languages - First aid courses - Conflict resolution - Communication and awareness tools Those needs were included within a broader Capacity Building strategy which also integrated detailed job description for PA staff as well as a program and costing of the trainings requested. Obstacles: Lack of funding at central level to implement the strategy. On the other hand, the Lebanese Ministry of Environment (MoE) has executed within its capacity building programmes as well as within the GEF/UNDP "Protected Areas" project (1996-2006), the FFEM/UNDP "MedWet Coast" Project (2002-2006) and the GEF/UNEP project on "Integrated Management of Cedar Forests in Lebanon in Cooperation with other Countries" all three executed by the MoE, many trainings for the Protected Areas Committees, Management Teams, local community as well as MoE staff, among them: - Training on biodiversity monitoring within protected areas to the management teams. - Training to all protected areas management teams and committees and concerned ministries about management planning and development of training programs to improve the management of the nature reserve. - Development of practical monitoring of biodiversity manual for some nature reserves to be used by the management team to monitor the ecological status of the sites. -Training on GIS use and application to be used in protected areas monitoring. -Training on mechanisms for administrative and financial procedures related to protected areas management.

Goal, Target			National Agenda & Policy tools	Description of progress and main obstacles
	Goal 3.2 (Continued) To build capacity for the planning, establishment and management of protected areas	By 2010, comprehensive capacity-building programmes and initiatives are implemented to develop knowledge and skills at individual, community and institutional levels, and raise professional standards		- Training of women in the surroundings of some nature reserves sites on organic/agro-food to be sold in the community-owned shop. - Eco-guide training program was conducted to train people from the local community to become guides in the protected areas. - Trainings on insect trapping to prevent possible threats form insects on the reserves trees. - Insect trapping.

	Goal, Target		National Agenda & Policy tools	Description of progress and main obstacles
	Goal 3.3 **To develop, apply and transfer appropriate technologies for protected areas**	By 2010 the development, validation, and transfer of appropriate technologies and innovative approaches for the effective management of protected areas is substantially improved, taking into account decisions of the Conference of the Parties on technology transfer and cooperation.	The Ministry of Environment has suggested the development of a Protected Areas Management information System PAMIS to be managed at Central level by the PA unit within MOE and used as daily management tool at Protected areas levels.	- The book of specifications of the PAMIS as well as the detailed policies and procedures were developed as part of the SISPAM project in 2006. However, the implementation of the software was delayed due to lack of funding. - A successful case-study on technology transfer is the case of Tannourine Cedars Nature Reserve: within the GEF/UNEP project on "Integrated Management of Cedar Forests in Lebanon in Cooperation with other Countries" executed by AUB under the supervision of MoE, the combined effort between academic institutions, research institutions, concerned ministries and local stakeholders have resulted in a containment of a pest that was threatening the Cedars trees in the nature reserve and the lessons learned from this project which are of great value have been transferred to all management teams of all Lebanese Cedars as nature reserves as well as to other Mediterranean countries with cedar forests that might face similar threats.

Goal, Target			National Agenda & Policy tools	Description of progress and main obstacles
	Goal 3.4 **Ta ensure financial sustainability of protected areas and national and regional systems of protected areas**	By 2008, sufficient financial, technical and other resources to meet the costs to effectively implement and manage national and regional systems of protected areas are secured, including both from national and international sources, particularly to support the needs of developing countries and countries with economies in transition and small island developing States.	In order to secure sufficient financial and technical resources to effectively implement and manage Protected Areas in Lebanon the Ministry of Environment has developed in 2005-2006: • A national action plan for protected areas NAPPA • A draft law program to secure the cost of implementation of the NAPPA • A National financial sustainable strategy for PAs that suggests alternative mechanisms for financing PA management • A Database for available sources of funding for PAs among international sources (list of potential donors and conditions, procedures for application) • Business Plans	The NAPPA prepared in 2006, included at its 9th activity the need to prepare a draft law program for the implementation of the action plan. The draft Law program, once endorsed by the parliament would secure recurrent and revolving fund over 5 years for proper execution of the activities forecasted in the NAPPA. To date the draft law program has not been processed for endorsement. The National financial sustainable strategy was approved at Ministry level and included a modified format for budget preparation at PA level. The updated formats were adopted by the MoE and the Management teams of the Nature Reserves to serve for future reporting. The Database for available sources of funding for PAs was made available for PAs to facilitate access to funding. Updated Business Plans were prepared for 5 PAs by MoE in 2005 aiming to suggest alternative sources of funding for improved PA management.

Goal, Target			National Agenda & Policy tools	Description of progress and main obstacles
	Goal 3.5 **To strengthen communication, education and public awareness**	By 2008 public awareness, understanding and appreciation of the importance and benefits of protected areas is significantly increased	Since the establishment of the first Nature reserve (1992), the Ministry of Environment has always thrived to work on awareness raising and promotion of the protected areas. In particular: • Declaration of 10 March as a National Day for Nature Reserves • Promotion of the World Environment Day • Preparation and distribution of Several Educational materials: guidebooks, slides, mobile exhibits about PAs produced and used in exhibitions and awareness activities. • PROTECTED AREAS IN LEBANON website	The following material intended for public awareness & education have been developed by MoE, and are being continuously distributed upon request: 1. Educational materials guidebooks, slides, mobile exhibits and teachers training courses. 2. Educational Video for Nature Reserves in Lebanon 3. Broadcasted a 30 seconds TV Spot about Protected Areas. 4. Sensitization and Awareness Campaign focusing on the conservation of biodiversity with particular reference to AL-Shouf Cedars, Horsh Ehden, Palm Islands and Tyre Coast Nature Reserves. 5. An eco-guide training module on five fronts: *Certified eco-guide / Tour operators both eco-tourism and traditional / Natural sites / Visitors / Local community.* 6. Wetland brochure 7. Website on Ramsar Sites in Lebanon Webpage on PAs under MoE website 8. Supply of news to the regional newsletter on wetlands and website 9. Informative booklet about the existing Protected Areas 10. 15 min documentary on PAs in Lebanon 11. A bird visitor field leaflet 12. Produced a poster on the values and benefits of wetlands 13. Screen saver on protected areas in Lebanon and a poster for the National Day for Protected Areas 14. Educational and environmental songs tape for Tyre Coast Nature Reserve. 15. Educational posters to be used during school awareness campaigns. 16. Posters about Ramsar Sites 17. Visitor field leaflets on the site's fauna & flora 18. Site brochures

Goal, Target			National Agenda & Policy tools	Description of progress and main obstacles
PROGRAMME ELEMENT 4: Standards, assessment, and monitoring	**Goal 4.1** **To develop and adopt minimum standard and best practices for national and regional protected area systems**	By 2008, standards, criteria, and best practices for planning, selecting, establishing, managing and governance of national and regional systems of protected areas are developed and adopted	The Draft Framewok Law on protected areas as well as the draft decree related to protected areas categories prepared by MoE in 2006 include standards, criteria and guidelines for planning, selecting and establishing protected areas. Nature reserve Management in Lebanon has shifted from NGO management (in 2002), to more participatory structure involving the Ministry of Environment (as advisory/tutelage body), Appointed Protected Areas Committee APAC (as supervisory body) and a contracted management team MT (as Executive body). This improved management structure resulted from constant monitoring of the former structure taking into account recommendations and outcomes of continuous consultative meetings and evaluators analysis. The Ministry of Environment developed in 2006 detailed Terms of Reference for the Protected Areas Committees (APAC) as well as job descriptions for the Management Teams members and included them in a draft decree.	The PA management system in Lebanon was assessed within a report entitled "*Protected Areas Management in Lebanon: Towards a Stable Institutional Management Structure"* providing: (1) a rapid overview over the definitions and categories of PAs mainly those adopted by international conservation agencies and conventions; (2) details through international case studies the various management approaches for Protected Areas; highlighting through lessons learned their applicability to the Lebanese context; (3) and finally analyses the existing management approach in Lebanon in light of stakeholder involvement; and assesses the managerial effectiveness of this approach to propose at the end a detailed description of stable management structure for PAs. The new Terms of Reference for proper PA management were ready since 2006, and since then they were followed as guidelines for eventual recruitment and in order to guide and orient daily activities. The draft decree related to the tasks of the protected areas committees and the management teams has not yet been processed into official channels to be endorsed. Main obstacle: The lengthy process for the adoption of the prepared legislation related to protected areas.

Goal, Target			National Agenda & Policy tools	Description of progress and main obstacles
	Goal 4.2 **To evaluate and improve the effectiveness of protected areas management**	By 2010**,** frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, national and regional systems, and transboundary protected area levels adopted and implemented by Parties	In order to make available for PA staff an adapted tool for management including planning, monitoring and adaptive management, the MOE has adapted in 2006 a management effectiveness tracking tool, inspired from the world wide World Bank and WWF tools.	In Lebanon, the first attempt to evaluate and report the progress of Protected Areas was conducted in 2004 as part of the UNDP/GEF Protected Area Project by applying the World Bank and WWF Management Effective Tracking Tool (METT) on three Nature Reserves (Palm Islands, Al Shouf Cedars and Horsh Ehden). The METT tool was included in the GEF final evaluation as a means to assess and evaluate the projects activities at PA level. An adapted Monitoring and Evaluating Tracking Tool (METT) for the performance of protected areas in relation to their management objectives, and reporting progress was developed by MoE in 2006. The tool has been adapted from the World Bank and WWF tool and its use has been promoted upon PA to be used yearly. In 2007, the adapted METT was used for Tannourine Cedar Forest nature Reserve to evaluate management effectiveness after the completion of the MoE/GEF/UNEP project related to the *Cephalcia tannourinensis* attack. In 2009, the same tool is being used by the GTZ Environmental fund for Lebanon projects related to Arz el Shouf Nature Reserve, and Kfar Zabad Hima. Main obstacle: the staff of PA is overworked and has little time to invest into management evaluation and monitoring of PA management effectiveness.

Goal, Target			National Agenda & Policy tools	Description of progress and main obstacles
	Goal 4.3 **To assess and monitor protected area status and trends**	By 2010, national and regional systems are established to enable effective monitoring of protected-area coverage, status and trends at national, regional and global scales, and to assist in evaluating progress in meeting global biodiversity targets		MOE developed a set of monitoring tools enclosing: • The Monitoring and Evaluating Tracking Tool (METT) • The development of the Protected Areas Management Information System (PAMIS) that consists of a set of policies and procedures for improved PA management, aiming at introducing automation in the management system.

Goal, Target			National Agenda & Policy tools	Description of progress and main obstacles
	Goal 4.4 **To ensure that scientific knowledge contributes to the establishment and effectiveness of protected areas and protected areas systems.**	Scientific knowledge relevant to protected areas is further developed as a contribution to their establishment, effectiveness, and management		1. Lectures, conferences, and courses related to Protected Areas are taking part of the academic curriculum within land use management courses, biodiversity conservation, and EIAs, etc… 2. Dissemination of scientific information on PAs on all academic institution and research centers 3. Development of documentation, studies, reports about the protected areas and their availability on the PAs website. 4. Involvement of academic and research institutions and independent scientific experts in the development of technical and legal documents for PAs 5. Promoting scientific researches and studies in the protected areas in all aspects related to the conservation and management of protected areas