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INTRODUCTION - 2002 COUNTRY PROFILES SERIES

Agenda 21, adopted at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992, underscored the important role that States play in the implementation of the Agenda at the national level. It recommended that States consider preparing national reports and communicating the information therein to the Commission on Sustainable Development (CSD) including, activities they undertake to implement Agenda 21, the obstacles and challenges they confront, and other environment and development issues they find relevant.

As a result, in 1993 governments began preparing national reports for submission to the CSD. After two years of following this practice, the CSD decided that a summarized version of national reports submitted thus far would be useful. Subsequently, the CSD Secretariat published the first Country Profiles series in 1997 on the occasion of the five-year review of the Earth Summit (Rio + 5). The series summarized, on a country-by-country basis, all the national reports submitted between 1994 and 1996. Each Profile covered the status of all Agenda 21 chapters.

The purpose of Country Profiles is to:

- Help countries monitor their own progress;
- Share experiences and information with others; and,
- Serve as institutional memory to track and record national actions undertaken to implement Agenda 21.

A second series of Country Profiles is being published on the occasion of the World Summit on Sustainable Development being held in Johannesburg from August 26 to September 4, 2002. Each profile covers all 40 chapters of Agenda 21, as well as those issues that have been separately addressed by the CSD since 1997, including trade, energy, transport, sustainable tourism and industry.

The 2002 Country Profiles series provides the most comprehensive overview to date of the status of implementation of Agenda 21 at the national level. Each Country Profile is based on information updated from that contained in the national reports submitted annually by governments.

Preparing national reports is often a challenging exercise. It can also be a productive and rewarding one in terms of taking stock of what has been achieved and by increasing communication, coordination and cooperation among a range of national agencies, institutions and groups. Hopefully, the information contained in this series of Country Profiles will serve as a useful tool for learning from the experience and knowledge gained by each country in its pursuit of sustainable development.

NOTE TO READERS

The 2002 Country Profiles Series provides information on the implementation of Agenda 21 on a country-by-country and chapter-by-chapter basis (with the exception of chapters 1 and 23, which are preambles). Since Rio 1992, the Commission on Sustainable Development has specifically addressed other topics not included as separate chapters in Agenda 21. These issues of trade, industry, energy, transport and sustainable tourism are, therefore, treated as distinct sections in the Country Profiles. In instances where several Agenda 21 chapters are closely related, for example, chapters 20 to 22 which cover environmentally sound management of hazardous, solid and radioactive wastes, and chapters 24 to 32 which refer to strengthening of major groups, the information appears under a single heading in the Country Profile Series. Lastly, chapters 16 and 34, which deal with environmentally sound management of biotechnology, and transfer of environmentally sound technology, cooperation, capacity-building respectively, are presented together under one heading in those Country Profiles where information is relatively scarce.

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LIST OF COMMONLY USED ACRONYMS

ACS	Association of Caribbean States
AMCEN	Africa Ministerial Conference on the Environment
AMU	Arab Maghreb Union
APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
CARICOM	The Caribbean Community and Common Market
CBD	Convention on Biological Diversity
CIS	Commonwealth of Independent States
CGIAR	Consultative Group on International Agricultural Research
CILSS	Permanent Inter-State Committee for Drought Control in the Sahel
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COMESA	Common Market for Eastern and Southern Africa
CSD	Commission on Sustainable Development of the United Nations
DESA	Department for Economic and Social Affairs
ECA	Economic Commission for Africa
ECCAS	Economic Community for Central African States
ECE	Economic Commission for Europe
ECLAC	Economic Commission for Latin America and the Caribbean
ECOWAS	Economic Community of West African States
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ESCAP	Economic and Social Commission for Asia and the Pacific
ESCWA	Economic and Social Commission for Western Asia
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FIDA	Foundation for International Development Assistance
GATT	General Agreement on Tariffs and Trade
GAW	Global Atmosphere Watch (WMO)
GEF	Global Environment Facility
GEMS	Global Environmental Monitoring System (UNEP)
GESAMP	Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection
GHG	Greenhouse Gas
GIS	Geographical Information Systems
GLOBE	Global Legislators Organisation for a Balanced Environment
GOS	Global Observing System (WMO/WWW)
GRID	Global Resource Information Database
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
IAEA	International Atomic Energy Agency
ICSC	International Civil Service Commission
ICSU	International Council of Scientific Unions
ICT	Information and Communication Technology
ICTSD	International Centre for Trade and Sustainable Development
IEEA	Integrated Environmental and Economic Accounting
IFAD	International Fund for Agricultural Development
IFCS	Intergovernmental Forum on Chemical Safety
IGADD	Intergovernmental Authority on Drought and Development

ILO	International Labour Organisation
IMF	International Monetary Fund
IMO	International Maritime Organization
IOC	Intergovernmental Oceanographic Commission
IPCC	Intergovernmental Panel on Climate Change
IPCS	International Programme on Chemical Safety
IPM	Integrated Pest Management
IRPTC	International Register of Potentially Toxic Chemicals
ISDR	International Strategy for Disaster Reduction
ISO	International Organization for Standardization
ITTO	International Tropical Timber Organization
IUCN	International Union for Conservation of Nature and Natural Resources
LA21	Local Agenda 21
LDCs	Least Developed Countries
MARPOL	International Convention for the Prevention of Pollution from Ships
MEAs	Multilateral Environmental Agreements
NEAP	National Environmental Action Plan
NEPAD	New Partnership for Africa's Development
NGOs	Non-Governmental Organizations
NSDS	National Sustainable Development Strategies
OAS	Organization of American States
OAU	Organization for African Unity
ODA	Official Development Assistance/Overseas Development Assistance
OECD	Organisation for Economic Co-operation and Development
PPP	Public-Private Partnership
PRSP	Poverty Reduction Strategy Papers
SACEP	South Asian Cooperative Environment Programme
SADC	Southern African Development Community
SARD	Sustainable Agriculture and Rural Development
SIDS	Small Island Developing States
SPREP	South Pacific Regional Environment Programme
UN	United Nations
UNAIDS	United Nations Programme on HIV/AIDS
UNCED	United Nations Conference on Environment and Development
UNCCD	United Nations Convention to Combat Desertification
UNCHS	United Nations Centre for Human Settlements (Habitat)
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNDRO	Office of the United Nations Disaster Relief Coordinator
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
UNIFEM	United Nations Development Fund for Women

UNU	United Nations University
WFC	World Food Council
WHO	World Health Organization
WMO	World Meteorological Organization
WSSD	World Summit on Sustainable Development
WTO	World Trade Organization
WWF	World Wildlife Fund
WWW	World Weather Watch (WMO)

CHAPTER 2: INTERNATIONAL COOPERATION TO ACCELERATE SUSTAINABLE DEVELOPMENT IN DEVELOPING COUNTRIES AND RELATED DOMESTIC POLICIES

Decision-Making: The Ministry of Foreign Affairs is responsible for preparing, coordinating and implementing the external policy affairs of the government of Lebanon. The Ministry of Environment is in charge of protecting the environment in general, setting regulations and standards, and advising on the wise use of implementing projects and programmes in a sustainable manner. The Council for Development and Reconstruction (CDR) is responsible for coordination and management of foreign assistance. The Council is the national government agency responsible for planning, mobilizing and coordinating external financing, and implementing large-scale and complex projects. CDR is also responsible for selecting companies, local and international, that have submitted bids for development projects and for supervising the work carried out on each project. The execution is carried out through the ministries in charge, governorates and/or municipalities. Since the Council for Development and Reconstruction (CDR) replaced the Ministry of Planning, it became the national executing agency for all national development projects (especially internationally funded ones). On the other hand, the Code of the Environment pointed to the establishment of a National Council for the Environment (Article 10) that would encompass representatives of various ministries, NGOs, scientists and others. In 1999, the Lebanese Government requested from CDR the preparation of a five-year development programme, which will accompany the five-year economic plan. The prepared Plan identified policy measures to be adopted by both the government and the private sector in order to promote an open and multilateral trading system. The law organizes the procedure of privatisation with the fundamental aims of increasing budget revenues, reducing the cost of public services and improving the efficiency of their delivery, and reforming the administration. The main possibilities for privatisation are in the telecommunications, electricity, water, and transport sectors. The Government addressed these macro-economic issues through the elaboration of a Five Year Fiscal Plan aimed at increasing macro-economic strength and stability, and the Five Year Development Plan aimed at strengthening and building the engines of growth at the micro-economic level, and at the same time improving the living conditions throughout Lebanon. NGOs, local authorities, industries and scientists are mostly involved in a decision-making process, either on a consultative or a playing-role level. For instance, NGOs manage the three protected areas included within the GEF-Protected Areas Programme, the National Council for Scientific Research is responsible for conducting scientific studies for the Protected Areas Project and the Agrobiodiversity project. The same concept is applied to universities or independent researches and academicians. The remaining groups (e.g. women, farmers, workers, municipalities, etc.) are rather considered as target groups and direct beneficiaries of any implemented activity or project.

Programmes and Projects: Lebanon has undertaken several projects pertaining to sustainable development, often in cooperation with and funded by international organizations such as the UNDP and the European Commission. The Lebanese Environment and Development Observatory (LEDO) is a project funded by the European Commission – LIFE Third Countries, managed by UNDP, and hosted by the Ministry of Environment. Launched in December 1999, its general objective was to provide proper information and better understanding of the state of environment and development in Lebanon. Other projects funded by the EU include technical assistance to the Lebanese Administration and a project for the industrial modernization Euro-Mediterranean Small and Medium Size Enterprises cooperation. Lebanon has also implemented the Capacity 21 Project, which worked on promoting sustainable development at the local authority level.

Status: Since 1990, Lebanon has undertaken important achievements and initiatives to reconstruct its economy and achieve a stable macroeconomic environment. The reconstruction period re-established the public infrastructure and basic social services. However, the reconstruction entailed major public debt, combined with an ineffective taxation system, has created serious fiscal challenges for the country. Furthermore, the policy of maintaining high interest rates allowed the currency to stabilize and inflation to be controlled, but at a cost of low investment in the private

sector. The Value Added Tax was introduced this year, and is expected to generate considerable returns to the Treasury.

Capacity-Building, Education, Training and Awareness-Raising: Television and newspapers are considered as the most important tools used to promote a better understanding for a closer cooperation for sustainable development. Also, local actors and international entities ensure such dissemination. The UNDP- Lebanon Country Office organized a UNDP MEDIA Award for Sustainable Human Development, a contest open to all Lebanese Journalists. This contest was organized under the patronage of the Minister of Information and in cooperation with the Press Syndicate and the Journalist Association. The overall objective was to raise awareness and to promote SHD and to encourage media to become partners and allies for increased and positive reporting on development and allies for advocacy. Many projects previously described will tackle directly or indirectly the capacity building side for technical experts and professionals. In addition, the FYDP (2000-2004) highlighted the need to promote the upgrade of management and industry expertise through: the establishment of business incubators that offer business support services as well as a physical location for SME in their start-up phases; knowing that the Ministry of Industry is proposing a national project to create six incubators; the promotion of knowledge and skill transfer from Lebanese firms abroad; the upgrading of executive education and training. Also, the FYDP report pointed out the fact that although Lebanon has currently numerous technical schools, curricula are outdated and limited practical training is provided to meet the needs of priority sectors. Therefore, it is crucial to create vocational and sectoral technical centres in line with the requirements of priority industries. These steps will be empowered by establishing a specialized telecom infrastructure (data network, additional leased lines), as well as a database of foreign companies and individuals in the Lebanese emigrant network.

Information: Data on bilateral, regional and multilateral cooperation are available through annual reports published by national institutions responsible for the management of international funds and funding agencies. For instance, some of the latest reports are prepared by UNDP (www.undp.org.lb), the Council for Development and Reconstruction; also available on the website: www.cdr.org.lb, the Ministry of Finance (website: www.finance.gov.lb) the Central Bank annual and progressive reports (website: www.bdl.gov.lb). In addition, data could be obtained through ministries where funded projects are implemented, the Official Gazette and the participation in conferences and seminars.

Research and Technologies: No information available.

Financing: Financing is provided by the EU, GEF, GTZ, and UNEP/MAP.

Cooperation: The Lebanese Government and UNDP/UNSO and the German Government (480.000 US\$ through GTZ) started a three-year national action programme aiming at taking stock of the current situation of desertification, to be followed by the formulation of a strategy for the management of drylands. Resources for programme implementation are to be mobilized. In mid-2000, GEF approved a project for the promotion of energy conservation, amounting to 3.5 million US\$. Early in 2000, GEF had approved the inclusion of Lebanon in the list of countries to benefit from small-scale grants for NGOs and local associations, and the programme is to be launched soon in Lebanon. GEF is also cooperating to support several other projects. Lebanon is a contracting party to Mediterranean Action Plan (MAP), Barcelona Convention plus five protocols. The bilateral cooperation between Lebanon and Syria witnessed a far-reaching agreement on environmental issues (signed in February 2000). The agreement covers joint actions to address environmental issues affecting agriculture, water safety, coastal area management and marine ecology, and the two countries are currently implementing a joint project on Coastal Area Management, as well as working on the establishment of common protected areas.

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CHAPTER 2: INTERNATIONAL COOPERATION TO ACCELERATE SUSTAINABLE DEVELOPMENT IN DEVELOPING COUNTRIES AND RELATED DOMESTIC POLICIES-TRADE

Decision-Making: The Five Year Development Plan (2000 - 2004) carried out by CDR pointed out the necessity of launching several short-term initiatives in order to produce world-class products and services. These initiatives include: the establishment of an Export Promotion Board to formulate export promotion strategies and monitor international markets for new opportunities; the establishment of a WTO unit at the Ministry of Economy and Trade to study the impact of liberalization on the economy, develop regulatory and legislative changes and work on Lebanon's accession to WTO; to enhance capacity to negotiate effective trade agreements with the Arab markets as well as with EU0; to improve marketing Strategy and Materials (Investment Development Authority of Lebanon IDAL) and create a database of Lebanese-owned firms located abroad.

Programmes and Projects: A three-point programme was suggested to strengthen the competitiveness of the productive sectors in the short term. These are immediate action to remove barriers to trade and foreign investment, mobilization of domestic and external financial resources for development cooperation, and transfer of environmentally sound technology and know-how.

IDAL initiated the One-Stop-Shop to facilitate the obtaining of permits by investors. It also developed a programme to support the export of agricultural goods.

The Ministry of Environment has been actively working on the issue of trade and environment, and has recently initiated a project (funded by UNEP/UNCTAD) on Monitoring and Promoting Synergy between Trade and Environment in Lebanon.

Status: Lebanon has applied for membership in the World Trade Organization (WTO) and was granted observer status in April 1999. The Lebanese Government recently signed the Euro-Mediterranean partnership. The partnership covers several areas of cooperation, including the progressive liberalization of trade in goods and services through a gradual phasing out of tariff and non-tariff barriers, the liberalization of the right of establishment and trade in services, and various aspects dealing with financial support and grants. Implementation of the partnership agreement would require various structural changes in Lebanon, targeting industrial, agricultural and tax policies. Also, Lebanon is party to the Arab Free Trade Agreement, and tariffs on certain goods are being reduced by ten percent annually among fourteen Arab countries. Free trade agreements were entered into force with Syria, Egypt, Kuwait and the United Arab Emirates. In addition, in February 1988 an agreement was entered into force between Lebanon and Syria, pursuant to which tariffs on industrial goods are being reduced by twenty-five percent per year since 1999. A similar agreement on the reduction of tariffs on agricultural goods was entered into in September 1999, pursuant to which tariffs have been reduced by fifty percent effective November 1999 with an annual reduction of ten percent over a five year period.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: The collection and dissemination of information is the responsibility of the Trade Information Center, Ministry of Economy and Trade, IDAL, and the Ministry of Environment.

Research and Technologies: The FYDP relative to year 2000- 2004 proposes the enhancement of firm knowledge, competencies and strategy as well as enhancing local competition through the Trade Information Center, a network of MET as first government-to-public e-commerce model in Lebanon. This will facilitate business access to up-to-date knowledge.

Establishment of an Economic Policy Unit to promote competitiveness measures in trade and services, intellectual property protection and competition policy, technical assistance in drafting competition policy and law sponsored by MET and funded by the World Bank.

The Lebanese Government signed (and still) several agreements aiming at increasing the investment of local companies and businesses in other countries.

Financing: Financing is provided by the Government, UN Agencies, World Bank, European Investment Bank, and EU.

Cooperation: It is observed that whereas collaborative and joint action in tourism development warrants to be accelerated, the approach of liberalization of agricultural trade appears hasty, particularly in the absence of a programme to accompany the required transformation and upgrading of the sector. A Lebanese – UAE free trade agreement was signed on 15 April 2000; it could set the stage for a three-way trade zone (Lebanon, Syria and UAE).

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CHAPTER 3: COMBATING POVERTY

Decision-Making: The Ministry of Social Affairs works with the High Relief Committee and the Council for Development and Reconstruction (CDR). A safety net operated mainly by NGOs (national and international NGOs such as Caritas, World Vision, Save the Children, etc.) provides an extensive reduction in poverty effects.

There is no Lebanese national policy to combat the effects of poverty. Emphasis is instead placed on addressing the causes of poverty. Policies in this regard include the increase in wages (which increases inflation and does not in any case cover past increases in cost of living), the stabilization of the national currency and limiting hyperinflation, and the use of indirect taxation on selected goods while reducing the income tax to a flat ten percent rate. The heavily debated Value Added Tax was introduced this year and the decision received major opposition due to its effect on the poor.

Programmes and Projects: Several projects for rural and peripheral areas are underway. Different ministries, with the collaboration of UN Agencies and other International Organizations, execute these projects. These projects aim to create an economic base for local community groups, which encourage them to stay in their areas of origin. Examples are the UNDP project aiming at encouraging the return of the displaced and the creation of economic projects for them, as well as several USAID initiatives to work in rural village clusters.

Status: There are no precise recent studies on poverty in Lebanon, but the social situation in the country continued to be very difficult after the war. According to trade unions, salaries in 1995 ought to have been increased by 90% to recover the level of the early 1990s. The unemployment level is estimated to be 26.4% of the active labour force. Some studies indicate that 61.9% of the families in Lebanon are low-income families, and that there are 12.9% of families with average income at or below 70 US\$.

The main activities mentioned above have had little effect in improving the social conditions of the poor. The environmental impacts of the above policies have been to encourage unsustainable real estate construction, which has put additional strains on access to clean water, healthy air, sanitary networks etc. In 1993, the Ministry of Social Affairs started reactivating social services centres in all regions of the country under an approach of decentralization of social welfare services to city and town quarters and to villages. In the Social Development Training Center, fifty-two young persons (84% of them being women) are being trained to become auxiliary social workers. The Council for Development and Reconstruction is initiating two projects that are to tackle poverty alleviation and social development.

Capacity-Building, Education, Training and Awareness-Raising: The initiative of the Government to establish higher vocational and technical education institutions is a positive step towards alleviating poverty. The Ministry of Health and the Ministry of Technical and Vocational Education are developing training programmes for health inspectors.

Information: Ministry of Social Affairs, Central Administration of Statistics, and UNFPA.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: The World Bank, EU, and USAID provide financial support.

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CHAPTER 4: CHANGING COMSUMPTION PATTERNS

Decision-Making: The concept of sustainable production and consumption is not yet applied in Lebanon. However, both the Ministry of Economy and Trade and the Ministry of Industry are responsible for production and consumption issues in general; the Service for the Protection of Consumers deals with consumption patterns. The Directorate of Industry within the Ministry of Industry has responsibility over industrial activity in Lebanon. The Ministry is responsible for registering and licensing industrial establishments. The Ministry of Environment has the duty to approve these establishments, monitor and audit industrial pollution, and launch awareness campaigns. The Lebanese Institute for Normalization (LIBNOR) sets production norms and standards. Even though promoting sustainable consumption and production is present at the governmental decision-making level, since it is not within the priorities listed on the short-term, this issue and the role of the government are not yet properly established. Municipalities are not involved in issues pertaining to consumption patterns. The Ministry of Finance administers tax incentives, however these taxes are not applied on unsustainable production and consumption patterns. A National Strategy or Policy on Sustainable Consumption and Production has not yet been formulated. A policy to promote the responsible use of new and renewable sources of energy will be formulated within the Investment and Planning Programme, funded by the European Union (at the Ministry of Energy and Water). A policy to promote the use of environmentally sound technologies for sustainable production is under formulation within the Ozone Office Programme. Lebanon's Capacity 21 Programme developed a "good housekeeping guide"-an environmental management guideline for small and medium-sized enterprises. The objective of this guide is enable these enterprises to identify simple and practical measures that can be undertaken to reduce the costs of production, enhance the company's overall productivity, and mitigate environmental impact. These measures deal with preventing the loss of raw materials, minimizing waste, conserving water, saving energy, etc. The SPASI project developed Environmental Auditing Manuals for industries, hotels and hospitals. All of these tools are to be adopted on a voluntary basis.

The private sector was actively involved in sustainable production by the promotion of the recycling sector (paper and paper products, glass, metal). Due to the lack of economic incentives and the high competition of local products with imported ones, however, these initiatives are subject to decline. Non-governmental organizations participated in promoting paper and metal recycling. For some of the NGOs, this initiative was limited to awareness campaigns. For others, a complete waste source-collecting programme was conducted in some areas of Lebanon. It is worth noting that women are playing a leadership role in Arab Salim in waste separation and sustainable consumption. Environment committees are established within business and private sector in order to enhance the environmental requirements of the industrial sector. Farmers have been encouraged to promote the reuse of organic waste as fertilizers.

Programmes and Projects: See under **Status**.

Status: No accurate data is available regarding the efficiency of energy and water use in either industry or households. However, regarding water, the national average net per capita daily water supply could be as high as 167 litres in presence of current water resources. But it was found that the average net consumption rate per person was about 64 litres per day, indicating substantial losses in the system. Energy consumption is estimated to be 0.94 toe (ton of oil equivalent) per capita. Measuring the efficiency of energy consumption is still hard at the moment. This problem is expected to be resolved with the launching of Investment and Planning Programme executed at the Ministry of Energy and Water. Domestic waste is estimated to be 0.8 kg/capita/day. Under the execution of the national programme for the ozone layer protection, adopted by the Ministry of Environment in co-operation with UNDP, the Ozone Office was established to pursue the phasing out of ozone depleting substances. Industries (mainly aerosols, foams, and refrigerator sectors) were approached to adopt technological substitutes using ozone friendly substances. Also, the Ministry of Environment, with the support of UNDP and funding from the EU, is initiating a regional project to manage olive oil residues and waste. Cement factories undertook a major

rehabilitation plan to install cleaner technology with fifty million dollars in loans from the IMF. Other projects executed include the study on Cleaner Production of Tanneries in Lebanon (Ministry of Environment), and the national plan for industrial waste management. It is noticed that neither the Chamber of Commerce nor the Ministry of Economy and Trade develop such programmes or pilot projects.

Priority constraints include mainly the difficulty of law implementation and monitoring. The Ministry of Environment has developed a framework for Green Certification coupled with incentive measures. Sustainable production and consumption are not on the agenda of decision-makers. The media, as well as non-governmental organizations, are playing a limited role in transferring proper information regarding sustainable consumption.

Capacity-Building, Education, Training and Awareness-Raising: The Ministry of Environment conducted several trainings and awareness workshops on environmental auditing. UNIDO conducted several workshops on clean technology (1996), ISO 14000 (1997); other workshops about cleaner production were conducted specifically for decision-makers. In general, the involvement of media is still very limited regarding environmental issues in general and consumption patterns in specific - probably due to lack of information. However, the Ministry of Environment conducted two workshops designed specifically to media where major environmental problems (mainly solid waste and water problems) were addressed and discussed. Also, many seminars, conferences, exhibitions and awareness campaigns about promoting reuse and recycling took place in a large number of schools and universities.

Information: Available information could be found at the Trade Information Center, the Ministry of Economy and Trade, the Ministry of Environment, the Chamber of Commerce, UNIDO offices and UNDP. Monitoring systems are not applied yet. However, the Ministry of Environment adopted a claim mechanism where industrial investigation is based on complaints and calls, as well as developed, through the SPASI Project, an industrial monitoring software. The Ministry of Environment also conducted a study that focused on auditing the tannery sector. The Unit of Planning and Programming, implemented at the Ministry of Environment, conducted a DSS System, an auditing programme applied on 30 industrial settlements all over the Lebanese territory. Finally, the Association Libanaise pour la Maitrise de l'Energie (ALME), a national NGO, has performed a number of energy audits with the support of ADEME. Generally speaking, the demand and marketing for such audit services remain limited due to the lack of consumer awareness and finance capability.

Research and Technologies: In the absence of proper legislation, the adoption of environmentally sound technologies in production is rather voluntary. Very few initiatives were conducted in this context, such as bottling redemption value programmes (Pepsi), installing cleaner technology plants (Cementerie Nationale), etc.

Financing: No funds are allocated for this issue.

Cooperation: UNDP's LIFE and Urban Management Programme sponsored solid waste recycling programmes in various forms. The Capacity 21 Programme acted through its local agendas on solid waste issues and getting rid of used cars (a priority within their action plan). The SPASI Project cooperated with the industrial sector in promoting clean technology.

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CHAPTER 4: CHANGING CONSUMPTION PATTERNS-ENERGY

Decision-Making: The Ministry of Energy and Water is in charge of energy issues. The petroleum and gas sector is the responsibility of the Directorate of Petroleum (MoP). The Directorate of Petroleum is responsible for licensing import activities, import and refining crude oil, import of fuel oil, and setting prices for petroleum products. Electricity is supplied through the Electricit du Liban (EDL) which is an autonomous state-owned entity under the jurisdiction of the Ministry of Energy and Water. For project implementation, the Council for Development and Reconstruction is responsible for the management of foreign funds and the execution of large-scale projects in cooperation with the Ministry/institution in charge (Electricit du Liban, Ministry of Public Works and Transport, Ministry of Environment, etc.). Regarding the regulatory framework, the Ministry of Energy and Water drafts decrees/laws that are forwarded to concerned Ministries for review and comment, and then to the Council of Ministers for approval. Local decision-making takes place through Mohafazats (Governorates) that provide municipalities with decisions and laws to be implemented. Then local authorities have the full right to enforce the application of these laws. In addition, they have the authority to set conditions for providing licenses necessary to implement regulations pertaining to energy.

Law relating to energy and energy-related aspects of atmosphere and transport defines general regulatory conditions for fuel derivatives settlements, distribution cisterns, and stations for distribution, storage and filling liquefied fuel (butane- propane). Allowing the import and use of diesel-operating trucks and buses; Defining conditions of use and monitor the diesel-operating trucks and buses, and the accepted levels and quality of emitted smoke; Setting up of a Central Committee for Energy, made up of Ministry of Energy and Water, Ministry of Industry, Electricit du Liban, the National Authority for the Litani River, Chamber of Commerce and Industry, and experts; Defining of items and goods allowed to be sold in gas stations. Establishing of a company to transfer liquefied petroleum through pipes from Tripoli and Zahrani reservoirs.

An energy strategy was prepared by the World Bank in 1998 to assist the Lebanese Government in promoting the efficient operation and development of the energy sector to meet the energy needs of the country in an economical sustainable manner. This strategy proposed an investment strategy as well as measures to reduce impact on the environment. Also, institutional reforms, restructuring and reinforcement of EDL, and financial aspects were also suggested at short, medium and long-term. Nevertheless, and despite the formulation of this strategy, priority is still given to a complete rehabilitation of the power plants in order to ensure the availability of electricity to all Lebanese regions. NGOs and scientists are mostly involved in formulating projects and programmes concerning energy. NGOs, consumer groups, scientists and other major groups have minor influence on changing energy consumption patterns, their intervention is being limited to research. For instance, ALME publishes regular booklets on energy and environment as well on alternatives to fuel.

Programmes and Projects: The General Directorate of Urban Planning is implementing the Project on Capacity Building for the Adoption and Application of Energy Standards for Buildings at the Ministry Public Works and Transport. This two-year project aims at developing and adopting energy codes and thermal guidelines for buildings to enhance energy efficiency and end-use performance. "Lebanon-cross sectoral energy efficiency and removal of barriers to ESCO operation" financed by UNDP and implemented at the Ministry of Energy and Water. This 5-year project aims at assisting Lebanon curbing GHG emissions resulting from inefficient end-use energy consumption in all sectors of the economy. The Climate Change Project, a UNDP/GEF funded project executed at the Ministry of Environment, was the only project design to target greenhouse gases issues in Lebanon. In fact, GEF, the Interim funding mechanism to the Climate Change Convention, along with UNDP, funded the Climate Change enabling activity in Lebanon to build national capacity in order to fulfil its convention requirements.

Status: The petroleum and gas sector is currently the responsibility of the Ministry of Energy and Water. The executing agency is the General Directorate of Petroleum (GDoP), which used to fall under the authority of the-

then Ministry of Industry and Petroleum. The GDoP is responsible for licensing import activities, import crude and fuel oil, and setting prices for petroleum products. Apart from a modest (and declining) amount of hydropower, Lebanon is entirely dependent on imports of fuel for energy. Not including hydropower, primary energy consumption in Lebanon was about 4.9 Mtoe in 1999, up from 3.5 Mtoe in 1993, which is equivalent to about 0.95 toe/person (or 39.9 GJ/person).

Primary energy sources include gasoline, gas oil, fuel and diesel oil, in addition to several other petroleum products that account for less than ten percent of fuel imports (aircraft oil, liquid gas and tar). In 1999, imports of primary energy sources reached 4,963 ktonnes, up from 4,192 ktonnes in 1995, which is equivalent to an increase of 18.5 percent. All the available primary energy is consumed. The consumption of energy has increased steadily over the past years.

Lebanon's national petroleum bill is a function of international oil prices and market fluctuations. Data on the cost of diesel oil imports was not available. This cost is however significant and would represent an important share of the annual bill (diesel oil imports represented almost 18 percent of total petroleum products in 1999 and presumably a much large percentage in 2000 for which data was not complete). The government bill for petroleum products declined by almost 26 percent between 1997 and 1998 (from US\$840 million to US\$624 million), and rose 29 percent from 1998 to 1999 (reaching US\$805 million).

Electricity is supplied through Electricité du Liban (EDL), an autonomous state owned entity under the jurisdiction of the MoEW. EDL operates eight thermal plants and at least five major hydroelectric plants. Three other hydroelectric plants also produce electricity (Nahr Ibrahim, El Bared and Litani) and sell the electricity to EDL. During the period between 1995 and 1999, power generation increased almost 67 percent to reach 8,186 Kilowatt Hour (KWh). In addition, Lebanon imports electricity from Syria via a shared grid system. Electricity imports began in 1995 at 292 KWh and have since almost tripled to reach 846 KWh in 1999. In 1999, total electricity consumption in Lebanon (generation and imports) was 9,032 KWh, up from 5,207 KWh in 1995.

The price of electricity supplied for domestic use ranges from LBP35 to LBP200 per KWh. The price hasn't changed since 1995. Small industries pay a flat rate of LBP 115/KWh, down from LBP 130 in 1995. Other industries supplied from a medium voltage grid pay LBP 320/KWh during peak hour. In addition, subscribers pay a municipal surcharge (equivalent to 10 percent of consumption), plus operation and maintenance fees (about LBP 5,000 per month) and subscription fees (about LBP 7,000 per month).

Despite significant improvements made to the distribution network since 1993, power shortages and rationing are still widespread, particularly during summer and following major storms. As a result, people have reverted to alternative power supply systems as back-up, such as UPSs (Uninterruptible Power Systems) for computers and private power generators. Neighbourhood power generators are back in business and supply electricity to subscribers *informally*. In 1996-97, nearly ten percent of all buildings were equipped with private power generators (mostly in Beirut and Mount Lebanon).

Capacity-Building, Education, Training and Awareness-Raising: The Ministry of Environment, and supported by UNDP, has elaborated on several tools (audit manuals, good housekeeping guides, etc.) to help reduce energy consumption. The Green Line is a national NGO aiming among its objectives to highlight to the public at large the dangers resulting from the use of fuel that adversely affect health and environment. It is also expected that the "Energy Efficient Buildings" project will work on disseminating information tools and increasing public and policy-makers' awareness of cost-effective energy-efficient building material, methods and designs, as well as energy efficient measures in buildings.

Information: Energy-related information is obtained from the Ministry of Energy and Water and the Electricité du Liban. Additional data is gathered from the Council for Development and Reconstruction, the Ministry of Environment, ALME and some universities. It is expected that the equipment for measuring stack air emissions will assist in obtaining accurate data in various areas in Lebanon. Data is usually obtained through visits and interviews

made to the concerned ministry/institution, and review of available documents. Energy-related information is usually disseminated through conferences.

Research and Technologies: The Association pour la Maitrise de l'Energie et l'Environnement (ALME), the American University of Beirut, the Lebanese University and the National Council for Scientific Research conduct researches on best means to introduce and apply the best means of renewable energy technologies in Lebanon.

Financing: The Five Year Development Plan prepared by CDR outlined the following project to be financed between 2000 and 2004 in the electricity sector. Removal of the remaining transmission bottlenecks: 12.000.000 US\$ (foreign fund); Removal of distribution bottlenecks that contribute to regional gaps in electricity consumption: 23.000.000 US\$ (government fund); Power sector restructuring and improvement of EDL's profitability and institutional capacity of total amount corresponding to 13.090.000 US. Projects to be financed by the Private sector (BOT): 681.000.000 US\$, Construction of the Liquid Natural Gaz Terminal at Selaata-Batroun: 400.000 US\$. UNDP: Climate Change Project (292.000 US\$). METAP/ Harvard Institute: Air pollution in Lebanon (15.000 US\$). FFEM/AFD/ALME: Building energy efficiency in Lebanon (5.700.000 French francs). Top-Up funding, Climate Change enabling activity, and additional financing for capacity building in priority areas (100.000 US\$). The Lebanese Government is deploying all possible efforts to attract investment in this respect. However, these efforts are not all oriented towards sustainable energy use and conservation. A large part of these investments is currently needed to build infrastructure required to upgrade the energy management in general. The government is also considering privatisation options.

Cooperation: No information available.

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CHAPTER 4: CHANGING CONSUMPTION PATTERNS-TRANSPORT

Decision-Making: The Directorate of Roads within the Directorate General of Roads and Buildings of the Ministry of Public Works and Transport (MPWT) is responsible for management, construction, and maintenance of the classified road network. Responsibility of major highways is shared by the Executive Council for Master Projects (CGEP), a semi-autonomous agency overseen by the MPWT, and the Council for Development and Reconstruction (CDR). CGEP is responsible for construction of the large infrastructure projects. The General Directorate for Urban Planning within MPWT is in charge of setting rules, regulations and designing plans relative to land occupation. The Ministry of Public Works and Transport is also responsible for regulating and supervising air, sea and land transport issues, establishing, equipping, and investing in transport systems within the public sector and developing these systems according to social and economic development needs of the country. Additionally, the Ministry of Public Works is responsible for preparing plans as well as technical and economic studies aiming at activating transport systems with maximum technical efficiency and economic feasibility, and enforcing laws and regulations relative to transport and marine public domains. The Railway and Public Transport Authority (RTPA) is an independent public authority under the supervision of the Ministry of Public Works and Transport. Reactivated and enlarged in 1994, the Land Transport High Council coordinates all land transportation activities. In addition, the following ministries/authorities are responsible for the following tasks: The Ministry of Energy and Water (fuel); Ministry of Interior (car licensing and enforcement of road safety); the Ministry of Environment (set standards for environment protection) and the local authorities/municipalities (local/secondary roads). A Higher Council for Terrestrial Transport was established in 1996. There are general regulations for construction of roads and highways, traffic system, and ports and harbours. In 1999, the Council for Development and Reconstruction prepared a Five Year Development Plan FYDP (2000–2004). The FYDP social and public Programme aims at improving the living conditions throughout the Lebanese territory. In this respect, roads and highways are considered a priority. For the Ministry of Public Works and Transport, the overall strategy is to rehabilitate an estimated total of 7000 km of road network according to international norms. A master transport plan will be undertaken by European consultants at the Ministry of Public Works in order to increase coordination between the Directorate for Urban Planning and the Directorate of Roads in the context of transport system. It is expected that this master plan will be finalized in 2003.

Programmes and Projects: The National Roads Project (NRP), funded by the World Bank, was established in the Ministry of Public Works (in 1997) to assist the Ministry in implementing a programme of urgently needed rehabilitation works and strengthening institutional capacity in the road sector. The Council for Development and Reconstruction is currently preparing the following projects to be implemented within the five-year plan. In Beirut, a Beirut Urban Transport project is currently under implementation. This project aims at improving the traffic in Beirut. The National Roads Project (NRP) aims at assisting the Ministry of Public Works and Transport in implementing a programme of urgently needed road rehabilitation works through financing a pilot programme comprising component of sector reforms to strengthen institutional capacity in the road sector. In 1996, A Programme Implementation Unit (PIU) was established at MPWT to assist the Directorate of Roads. Concerning the Council for Development and Reconstruction, priority will be given to rehabilitation projects of regional roads, due to the relative scarcity of funding. As far as Beirut is concerned, besides the completion of projects that are underway or currently under preparation, the focus will be on the improvement of existing roads (traffic lights, over/underpasses).

Status: Land and marine transport exert significant pressures on the physical and biological environment in Lebanon. Impacts of the transport sector begin with the construction of roads, harbours, and airports, which causes significant and sometimes irreversible impacts on landscape, ecosystems, and natural resources. Later, as passenger and freight vehicles travel on the roads, ships dock into harbours and sail off the coast, and planes take off and land, they release harmful pollutants into the air, land, water, and sea.

The Government's efforts to mitigate the negative environmental impacts from the transport sector have been rather limited and uncoordinated. Positive initiatives such as the EIA decree for major transport projects and enforcing the recent law on the phase-out of diesel fuel and leaded gasoline are expected to reduce the impact of the transport sector on the environment.

Lebanon had about 22,000km of roads in 2001, of which 30 percent are classified and fall under the authority of the MoPWT, while the remaining 70 percent (about 15,400km) are non-classified roads governed by municipalities. International roads make up less than 10 percent of the "Classified road network," which has increased in length by about 5 percent from 1995 to 2001. "Rural roads" account for over 70 percent of the Non-classified road network, which totals about 15,269 km. Internal roads, town roads, and village roads are the other categories of non-classified roads. The total road network covers an estimated 138 km², or about 1.4 percent of the total surface area of Lebanon. Non-classified roads alone cover an estimated 92 km² of land (using an average width of 6 meters), or 67 percent of the roads' total surface area. Therefore, it will be important to build environmental management capacity of both the MoPWT and municipalities in order to mitigate the environmental impacts of roads in the future.

Provision of transport services is yearly upgraded in terms of rehabilitation of road networks, traffic regulations and public transportation reaching most of rural areas. The inadequacy could be highlighted as follows. Lebanon transportation sector is estimated to a fleet of over one million registered vehicles that could be characterized as being relatively old and poorly maintained. Moreover, the rate of car ownership (3 persons for every car) is amongst the highest in the world. Traffic congestion in urban areas is severe. The classified road network plays an important role in activating the socio-economic sector in Lebanon. It is well developed and distributed throughout the country. The Beirut International Airport has been subject to a thorough rehabilitation and expansion. It is expected that these works will be finalized by 2005. There is a need to create availability and incentives for public transportation, auto inspection enforcement etc. Vehicle emissions in urban areas, and especially in Greater Beirut, are likely to be causing elevated lead and ozone concentrations. Inside Greater Beirut, most of the measures are within the scope of traffic control rather than traffic jam reductions. Due to increased number of accidents, the Ministry of Interior put in place series of traffic safety measures to reduce the number of accidents and deaths.

Capacity-Building, Education, Training and Awareness-Raising: An NGO called Youth Association for Social Awareness developed an auto-guide of four hundred pages that includes traffic signs, important notifications on accidents, important notifications for drivers, necessary car equipment, recommendations on the usage of seatbelts, short travels, traffic law, and many other required data to ensure safety and educate the public on traffic regulations. This guidebook is sold (and not distributed) for an amount of 15 US\$. During the last two months, this NGO undertook a wide awareness campaign to promote the use of safety measures such as seatbelts and exposing threats that are related to excess velocities. In addition, TV spots are provided by the Committee for traffic affairs to increase awareness on traffic safety issues. The Ministry of Interior is conducting several awareness activities within this context.

Information: The Programme Implementation Unit prepared a list of existing national database on the road sector, and overviewed the transfer of this database to the Directory of Roads. The database included the road inventory and condition survey developed on GIS, roughness measurements, axle road survey, and vehicle operating cost and traffic surveys. It also included the creation of a database of the network using Geographic Information System (GIS). Scientific data on vehicle emissions is usually available at the American University of Beirut through their research programmes, the Ministry of Environment (studies), and international funding agencies- they are, however, restricted to concerned groups. The only daily news on traffic and road conditions (jams, works, etc.) are made available through daily reports provided by radios and TVs. Approximate vehicle emissions are not publicly disseminated, but are available to interested individuals and entities upon request from the institution in charge.

Research and Technologies: A comprehensive Road Rehabilitation Programme (RRP) was developed at the Ministry of Public Works and Transport to carry out a systematic evaluation of the rehabilitation needs of the road network, using the Highway Design and Maintenance Standards Model (HDM) and its supporting Expenditure

Budgeting Model (EBM) which have been developed by the World Bank. In 1999, Harvard Institute for International Development (HIID) financed a study entitled “Economic and social impact of mobile sources of air pollution on public health in Greater Beirut Area”, in cooperation with the Ministry of Environment. The Lebanese Center for Policy Studies (LCPS) undertook this study that investigated concentration levels of various air pollutants and their effects on public health as well as calculated the total annual cost of air pollution on health in Beirut. The Final Report of the Climate Change project reported that some technologies started to be promoted in Lebanon. A Traffic Management guideline was prepared by the Ministry of Public Works and Transport - PIU for implementation during maintenance and rehabilitation works in order to reduce impacts resulted from the disruption of traffic flow and access patterns. Also, technical manuals are currently under preparation by the PIU and relative to the Standard Technical Specifications (for Roads and Bridges), maintenance manual, road safety and signing manual, and other documents that contribute directly or indirectly to improving traffic management.

Financing: The Five Year Development Plan (2000 – 2004) prepared by the Council for Development and Reconstruction showed that a total of approximately 1.736.500.000 US\$ is allocated for roads and highways, and 145.693.000 US\$ for the transport, corresponding respectively to 27.30% and 2.29% of total. The estimated expenditures over 2000-2004 are respectively 1.436.500.000 US\$ (corresponding to 1.492.500.000 US\$ from the national budget and 244.000.000 US\$ of foreign funding) and 105.693.000 US\$ (143.347.000 US\$ from the national budget and 2.346.000 US\$ of foreign sources). To overcome the financial deficit, financial scenarios are solicited. Between January 1992 and December 2000, the GoL has awarded 141 contracts for road and highway projects worth a total of US\$564.5 million (consultancy and design as well as works and equipment supply). Capital investment projects include road rehabilitation works in Beirut, Tripoli and Zahle, completion of key segments of the coastal expressway, new peripheral and penetrating roads for Beirut, street lighting, Beirut-Damascus expressway, and new secondary roads in North Lebanon.

Cooperation: Lebanon ratified several bilateral agreements to regulate the transport system such as the Law 86, date 14/6/1999, allowed the government to sign an agreement relative to the international terrestrial transport between Lebanon and UAE, signed 27/5/1998, the Law signed in February 1994 allowed to establish a cooperation agreement between the Lebanese Government and the Syrian Government, signed in 16/9/1993. Air transport bilateral agreements are being signed and activated with the following countries: Armenia, Sri Lanka, Republic of China, Brazil, Poland, Bulgaria, Indonesia and Tchad, Holland and France. Lebanon has signed and ratified several international agreements, such as the:

- agreement to enforce regulations pertaining to international air transport (Varsovia, law no. 160/33;
- International Chicago Agreement for Civil Aviation;
- three protocols for the amendment of the international civil aviation set in Chicago in 1944;
- International Agreement on the acknowledgment of the rights on airplanes held in Geneva;
- International Rome Convention, signed in 7/10/1957, regarding the definition of rights resulting from damages on lands caused by airplanes;
- Agreement held between Countries member of the Arab League stating the establishment of a Council of Civil Aviation for Arab Countries;
- International marine conventions;
- Intergovernmental Consultative Organization of the Marine navigation (ICOM);
- agreement relative to defining freight lines- London 1930;
- agreement relative to human safety in seas- London 1978, amended by London Convention in 1960;
- Barcelona Convention and its four Protocols;
- United Nations Convention on the carriage of goods by Sea (law no. 4/83); and
- International Convention on the limitation of responsibility of boats owners (law no. 294/94).

The commitment of Lebanon towards obligations required by these agreements has not been fully assessed.

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CHAPTER 5: DEMOGRAPHIC DYNAMICS AND SUSTAINABILITY

Decision-Making: The Ministry of Social Affairs is principally responsible for demographic policies, and the Central Administration of Statistics is the official source for all census studies in the country. International organisations support this issue both technically and financially, while non-governmental organizations have limited programmes in this area.

Programmes and Projects: The Central Administration of Statistics (CAS) has regained an active role in demographic studies, and has conducted considerable work relating to population studies. The Ministry of Social Affairs, UNICEF and UNFPA are also supporting CAS in its mandate. The Lebanese Environment and Development Observatory, funded by the EU, managed by UNDP, and executed by the Ministry of Environment, provides open access to information related to environment and development issues, including demography.

Status: The Central Administration of Statistics (CAS) has estimated Lebanon's population at 4 million people in 1997. Based on this official estimate, the 2001 State of the Environment Report projected Lebanon's resident population at about 4.3 million in 2001. The growth rate is estimated at 1.7% and migration at 0.2%. Average age for marriage is 27.5 for females and 30.9 for males.

Since the last comprehensive population census dates back to 1932, there continues to be no agreement on the actual size of the Lebanese population today. The two latest government surveys have produced significant differences in their estimates, from 3.1 million (Ministry of Social Affairs 1996) to 4 million people (CAS 1996-97), up from 793,000 in 1932. Population size is increasing at the rate of 1.65 percent yearly - about 66,000 net births in 1999. Average life expectancy is 71.3 years; it is lowest in the North (68.5 years) and highest in Beirut (74.5 years).

About one third of the total population resides in Beirut and its suburbs. While Beirut accounted for 22.3 percent of the population in 1970, with the expansion of the Beirut suburbs, this share has decreased to just 10 percent in 1997. Within the Beirut suburbs, the highest proportion of the population resides in the immediate extension of Beirut.

Information on gender and age distribution of Lebanese population is provided by CAS (1998) and was not updated for 2001. The population is roughly equally divided between males and females. This ratio varies slightly according to the age group. For example, in the age groups 0-19 and above 60, there are slightly more males than females, and there are more females across all other age groups (age 20-59). Moreover, a comparison of the population by age groups between 1970 and 1997 reveals that the population is becoming older. Compared to 1970, there are fewer young people (age group 0-19) and more elderly (age group above 60). In 1997, more than half of the population was in the 20-59 years age bracket.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: The collection and dissemination of information is the role of the Central Administration of Statistics, Lebanese Environment and Development Observatory, UNFPA, Ministry of Social Affairs, and UNICEF.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: The Ministry of Displaced in cooperation with the Ministry of Agriculture, the Ministry of Public Works and Transport and the Ministry of Education, the EU, UN agencies and NGOs is implementing income generating programmes in former war zones in order to enable people to stay in their areas. Several projects worked on the rehabilitation of agricultural training centres and water networks that were damaged during the war and give loans to farmers to renew their agriculture, repair terraces and irrigation networks. Schools were reconstructed to receive returning people.

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CHAPTER 6: PROTECTING AND PROMOTING HUMAN HEALTH

Decision-Making: The Ministry of Public Health (MoH) is responsible for the public sector side of health care. It receives good support from the national budget. Construction of several hospitals is underway in rural areas, mainly in the North, Bekaa and South Lebanon.

Programmes and Projects: See under **Status**.

Status: There is uneven coverage of health service in Lebanon. Private sector hospitals account for ninety-five percent of health care, with an oversupply of services, while public health care is under-staffed and under-equipped. Most top quality specialized care is concentrated in and around Beirut. The Ministry of Public Health spends eighty percent of its budget paying private hospitals to cover the costs of health care of individuals covered by social security plans. Reproductive health is available at high standards, whether through hospitals or local clinics. There are 760 local clinics, 80% of which are run by NGOs and CBOs. Lebanese hospitals have 11500 beds whereas 9000 more would be needed to cater for the whole population. Health costs have been increasing drastically- two-fold between 1989 and 1992. Preventive programmes were initiated for very basic diseases such as measles, polio, etc. Programmes related to health problems derived from environmental pollution are still in infancy stages. Two studies were conducted in this respect. One tackled the socio-economic impacts mobile sources of air pollution (METAP/HIID) and the other studied the effect of water pollution on the health bill (Ministry of Environment). The main emphasis is on the effects of toxic and hazardous wastes imported from Europe. Health problems due to such sources as power plants, industrial point sources, and ground water contamination are still tackled through *ad hoc* planning. A legitimate assessment of the current situation cannot be presented due to lack of field monitoring of sources and the absence of health registries documenting the true scope of related causes and effects.

During the last ten years, the government rehabilitated thirteen public hospitals, bringing the total number of hospitals in the country to twenty-seven. The Ministry of Public Health, along with other non-governmental organisations and international agencies, provides free vaccination for major diseases.

Capacity-Building, Education, Training and Awareness-Raising: In 1996, a National Committee for health and security at home, at work and on the road was created to inform the public and to promote security through media campaigns and other initiatives. Several NGOs conduct awareness activities and promote health education. The academic sector in Lebanon is playing a major role in building capacities and undertaking awareness activities.

Information: No information available.

Research and Technologies: No information available.

Financing: Government expenditure on health is more that 8.5% greater than that contributed to public expenditure, with revenue of approximately 6.7% of the expenditure.

Cooperation: The Ministry of Health in cooperation with the World Bank, WHO and UNICEF is introducing a primary health care programme in the National Health System to all of the population. Costs for the programme are \$33 million.

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CHAPTER 7: PROMOTING SUSTAINABLE HUMAN SETTLEMENT DEVELOPMENT

Decision-Making: Within the government structure, the Council of Ministers, the General Directorate of Urban Planning, the Ministry of Public Works and Transport, and individual municipalities work on settlement issues. The private sector includes conglomerate Real Estate Companies: SOLIDERE, ELISSAR, and LINOR. There are also NGOs seeking to counter unsustainable construction (with little effect up until this point).

Programmes and Projects: No information available.

Status: Before the war of 1975, the benefits of economic development were concentrated in the capital area around Beirut, the Zahle area, with its rich agriculture and agro-processing, and, to a lesser extent, the coastal zone of Tripoli and Saida. Thus, Beirut accounted for fifty percent of the population and over sixty-five percent of economic activity. The war resulted in decentralization and multi-polarization of the economy and human settlements. The principal problem now is that human settlements are currently being undertaken by private sector entities whose human resources and technological capabilities are high, but whose goals are oriented towards profit making, with little regard for environmental sustainability. These groups are financed through over-the-counter shares, direct investment, and stock market trading.

The resettlement of those displaced during the war is of national importance. The end of the war redirected economic activity towards the capital and its neighbouring coast once Beirut became again the most likely place to find a job and a good education. This back-and-forth development has put great strains on infrastructure (water supply and waste water disposal) as well as on urban air quality in the capital. Since the end of the war, *ad hoc* real estate development in and around Beirut and in Mount Lebanon has become rampant, and this has been a major contributor to environmental degradation. Zoning laws instituted in the 1950s and 1960s are bypassed or ignored with the aid of systemic corruption, and zoning-mandated green spaces mandated in zoning are rarely preserved. The Council for development and Reconstruction is initiating a general land use plan at the national level.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: No information available.

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CHAPTER 8: INTEGRATING ENVIRONMENT AND DEVELOPMENT DECISION-MAKING

Decision-Making: The Ministry of Environment (MOE) is responsible for policy planning and setting laws and regulations. Line Ministries, local authorities, and other national authorities are responsible for implementation, including, among others, the following: governmental bodies such as the Ministry of Public Health, the Ministry of Energy and Water, and the Council for Development and Reconstruction; para-statal bodies such as the National Council for Scientific Research, the Chamber of Commerce, and the academic institutions; and more than fifty NGOs working in the social, health, development, and business fields. Among these organisations are the Lebanese Environment Forum, the Green Forum, the Association for Forest Development and Conservation, the Green Line, the Society for the Protection of Nature, and the Lebanese Businessmen Association.

The Council for Development and Reconstruction (CDR) is a planning body and ensures coordination of foreign funding. NGOs have influenced policies on some occasions, and the private sector can be mobilized to play a major role. Because of the impact of war on administrative structures and human resource abilities, environmental management suffered from grave problems: inadequately qualified personnel, inefficiency, low salaries, and overlapping responsibilities. The Government recognizes the urgent need for reform and rehabilitation and considers the institutional strengthening as a significant component of the recovery programme. This recognition was translated in the creation of several ministries, specifically the Ministry of Environment and the Ministry of Administrative Reform.

The Ministry of Environment was created by Law 216 (April 1993) and is empowered to study, propose and implement national environmental policies. It is considered the only regulatory environmental agency in the country. The Ministry is committed to ensuring good implementation and enforcement of environmental legislation, acts and regulations. Among the most important responsibilities of the MoE in the field of environmental management is the identification of permitting conditions for new industries (including quarrying and mining activities) and the enforcement of appropriate remedial measures for installations. The necessary environmental management schemes that can support MoE to fulfil this particular obligation are essential at this stage of reconstruction and development of the Lebanese economic sectors. MoE has initiated several projects to assist Government efforts to integrate sustainable development within national plans. These programmes have led to the development and updating of the laws such as Code of the Environment, EIA legislation, Natural sites and Monuments review, framework law for protected areas and updated environmental legislation. The review of legislation is ongoing and planned to continue. Lebanon has a large body of environmental laws, some dating back to the 1930s. However, these laws are characterized by obsolescence, lack of clarity and lack of coherence. MoE also enacted emission and ambient quality standards for air, water and noise pollution. However, the standards are difficult to enforce because of the fragmented and small-scale nature of industry and the lack of institutional capacity. All of the enacted laws need to be further ratified by Government, and enforcement mechanisms need to be established.

Programmes and Projects: Outside the on-going efforts by MoE and CDR, the National Administrative Rehabilitation Programme can be considered as a new national mechanism within the scope of the Ministry of Administrative Reform that can be drawn upon for ensuring a broad national intervention at the Government level. This programme is constantly looking into the following: sectoral and cross sectoral departmental programming, approach a coordinated appraisal of sector institutions requirements, an on-going review of the mandate and attributions of all public institutions and a rising demand for better and more efficient public services. NGOs are also making an effort to better network and coordinate their activities and share experiences. These efforts need to be assisted by the international community, since the national efforts are proving incapable of moving forward at the required pace. In 1992, the CDR prepared and launched the National Emergency and Reconstruction Programme (NERP). This \$2.25 billion programme was aimed at restoring basic infrastructure services such as

electricity and telecommunication sectors in the country. The plan was essential to allow proper functioning of the private sector, which would be mobilized to increase economic activity.

Garbage collection has been put in place in Beirut and is gradually being extended to other regions. Renewing of roads and services in the northern and southern suburbs of Beirut is taking place. Work is progressing in the rehabilitation and re-building of educational facilities. The Government has also embarked on construction of a number of major new development projects, such as new power generating facilities, wastewater treatment plants, the Beirut International Airport, expansion of the Lebanese University and some urgently required roads projects.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: A Monitoring and Reporting Strategy for environmental programmes in Lebanon was developed by UNDP. Regarding environmental education and awareness, a national awareness plan has been established, but has not yet been implemented. Re-enforcement of the Protocol between MoE and the Ministry of Education will be updated soon. Many lessons have been learned about capacity-building. First, on integration, that the pressure exerted by NGOs has led to government organizations and line ministries adopting EIAs and environmental considerations within many of their plans. Secondly, on participation, all stakeholder groups are actively involved in capacity-building, however coordination among various groups needs to be strengthened. Thirdly, on information, the Ministry of Environment, the Ministry of Administrative Reform, and UN agencies are initiating various efforts to support national initiatives in this area. More often the media, such as TV and newspaper publishers participate in national campaigns. Capacity-building principles can be applied to development programmes through the following tools and mechanisms: cooperation of all concerned groups for the provision of technical assistance, training and environmental awareness; preparation and implementation of Local Agenda 21s; updating the legal framework in priority areas follows; promoting participation and networking among NGOs, private sector and government organizations; promoting participation of people in development decision-making and implementation through local authorities such as municipalities.

Information: The Ministry of Environment and UNDP play the most important informational roles with respect to sustainable settlement issues.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: Lebanon is a member of The Mediterranean Commission on Sustainable Development, through the Mediterranean Action Plan (MAP); The Mediterranean Technical Assistance Programme (METAP); The Euro-Mediterranean Partnership, and The Arab League. An exchange of experience on sustainable development activities takes place through the bodies such as Center For Environment and Development for The Arab Region and Europe (CEDARE); UTDA and others exchange programmes; METAP networks - MEDCITIES/ ECOMEDIA/ MEDNFP etc.; EU's SMAP; and UNEP -MAP and activity centres meetings.

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CHAPTER 9: PROTECTION OF THE ATMOSPHERE

Decision-Making: The Ministry of Environment (protection of the environment) and the Ministry of Energy and Water (management of energy and energy resources) are responsible for the management of related issues. The Ministry of Public Health is responsible for health and health related issues, the Ministry of Interior is responsible for enforcing regulation pertaining to car emissions, and the municipalities are responsible for all enforcement at local level. The Ministry of Environment drafts decrees/laws that are forwarded to concerned Ministries for review and comment, and then to the Council of Ministers for final approval and activation. In the case of laws, draft laws are sent to the Parliament where they will be subject to an in-depth study by the Parliamentary Committees. The approved law/decreed will be disseminated through the Official Gazette. In the case of implementing internationally funded projects, e.g. the Ozone Office (a UNDP Project executed at the Ministry of Environment), the Ministry of Environment along with the Ministries of Finance, Industry, and Education gave consent to implement the Ozone Country Programme. In early 1994, a National Working Committee on Ozone Depleting Substances was formed to support the Ministry of Environment in the ODS issue. This Committee has representatives from the Ministry of Finance, Ministry of Industry and Petroleum, Ministry of Education, Department of Customs and Chamber of Industry and Commerce, Association Libanaise pour la Maitrise de l'Energie (ALME), Lebanese Universities (research institutions) and Industry Association. The role of the National Working Committee is to be the main consultative body in ODS and Montreal Protocol related issues in Lebanon and is responsible for the preparation of governmental/publicly supported measures to phase out the ODS in Lebanon. The rate of air polluting gases and deforestation were adopted as main indicators for the planning and execution of projects during the Five Year Development Plan (2000 – 2004).

The Decision 52/1 (1996), updated by decision 8/1 (2001), was issued by the Ministry of Environment, and pertained to specifications and rates relative to reducing pollution of air, water and soil. The Law 6603 (issued 1995, Ministry of Environment) defines the conditions for use of large vehicles (trucks), buses, and diesel operating vehicles, in addition to monitoring the acceptable average and quality for smoke emissions. This law defines the maximum allowed main pollutants emitted by these vehicles. Decision 15/1, 2000 (amending decision 23/1, 1995) banned the use and import of vehicle fire extinguishers containing halons. Currently, work is proceeding on promulgating decisions pertaining to licensing system for import and export, banning importing equipment containing ODS, and specifically CFCs. An EIA decree was prepared by the Unit of Planning and Programming, a World Bank project executed at the Ministry of Environment. An EIA chapter is provided in the Code of the Environment. Proposals to amend Law 6603 suggests incentives and measures such as adopting lower prices for unleaded fuel prices compared to leaded fuel. Regulatory measures would include the obligatory use of catalytic converters, annual inspections of car exhausters, etc.

A national GHG mitigation strategy has been elaborated by the team of experts of the Climate Change Project (GEF/UNDP funded project) in 1999, and introduced in the Technical Annex to Lebanon's First National Communication Report to UNFCCC, which assesses and evaluates in details feasible options for GHG emission reduction. A national strategy to implement the introduction of methyl bromide is underway (UNDP/MoE). The implemented strategy in Lebanon is the overall strategy adopted by Montreal Protocol in phase of ODS consumption and production.

Scientists, university academicians and only one NGO (Association Libanaise pour la Maitrise de l'Energie) are highly involved in (1) the Steering Committees pertaining to Climate Change and Ozone Office, (2) research programmes and (3) technical consultants. Their role is rather advisory with a high participation level. Industries are highly involved in the Ozone Office activities as (1) target groups in phasing out ODS substances and (2) decision-makers in participating to the formulation of regulatory and legal tools. Quite recently (June 2002), the government enacted a law prohibiting the use of diesel fuel for cars, an effort which would drastically improve the air quality in the country.

Programmes and Projects: Lebanon ratified the Vienna Convention on March 30, 1993 and the Montreal Protocol on March 31, 1993. A National Working Committee on ODS was established in 1994. The committee overviewed the preparation of the Country Program, which was ultimately approved by the Ozone secretariat and led to the establishment of the Ozone Office at the MoE in January 1998. Lebanon has since received US\$179,000 from the Multilateral Fund (MLF) to implement institutional strengthening projects, and about US\$6.2 million for technology transfer and ODS phase out. Phase out implies that local industries dismantle and destroy manufacturing equipment that use ODS, and replace them with equipment that does not use ODS. Implementing/supporting agencies include UNIDO, the UNDP, the FFEM and GTZ. While ODS are still imported (and will be until industries phase out ODS completely), halons were banned in July 1994. The GoL expects to phase out ODS completely by 2007.

Pursuant to the Montreal Protocol (ratified by Lebanon on Sept. 16, 1987), the MoE initiated the Methyl Bromide Alternatives Project in May 1999. This initiative was followed by the ratification of the Copenhagen amendment in December 2000. Funded by the Multilateral Fund (MLF) of the Montreal Protocol, and managed by the UNDP, this project aims to phase out methyl bromide in Lebanon even before the deadlines set by the Montreal Protocol for 2015. The project has demonstrated the efficiency of all available alternatives to methyl bromide over four consecutive growing seasons in 19 sites around the country.

In June 1992, Lebanon was among 155 countries that signed the United Nations Framework Convention on Climate Change (Rio de Janeiro, 1992). Following its ratification in 1994 (Law 359/94), the GoL prepared the 'First National Communication on Climate Change' (MoE-UNDP, 1999). The National Communication Report represents the fruit of a concerted effort among many experts and collaborating institutions (LNCSR) and organizations (UNEP). The work included the preparation of a national inventory of GHG emissions by sources and removal by sinks, with 1994 as a base year. The inventory was developed according to the revised 1996 IPCC¹ guidelines. The GoL secured at the end of 2001 a GEF top-up fund to update Lebanon's greenhouse inventory and thereby produce its second national communication.

The MoE/SPASI developed National Standards for Environmental Quality (NSEQ) and promulgated these new standards through Decision 8/1 (1/3/2001). The NSEQ set realistic emission levels compared to the previous Decision 52/1 (1996). The NSEQ apply to all sectors of industry and cover stack emissions and wastewater discharges. For stack emissions, the NSEQ include general emissions limit values by group of pollutants and specific regulations for single branches of industry.

Status: No measures have been introduced yet to the industrial and agricultural sectors, although greenhouse gas emissions in Lebanon mainly come from energy activities, responsible for eighty-five percent of all CO₂ emissions. Air pollution is considered among the most serious problems in Lebanon mainly due to its increasingly deleterious impacts on health (asthma and other respiratory problems) although Lebanese inhabitants are still unaware of the linkage to be made between their healthy problems and the status of the surrounding environment where they live. This pollution is resulting from the high density of people living in urban areas (around 350 inhabitants/km²) that lack the minimum needs of green cover. In addition, more than a million cars are operational in Lebanon (more than fifty percent in Beirut Capital with an average of three persons per car). It is notable that more than sixty-five percent of industries are located on the coastline, which has the highest rate of population growth. In the period immediately following the war, the environment was not considered a priority. Finally, it is not to forget the bad agricultural practices. The CO₂ emissions from energy use in manufacturing industries and construction represent twenty-four percent of the energy sector's total emissions. All these factors exert an impact on the atmosphere, some of them reflecting an immediate negative effect, others will be more visible at medium and long term. There is no ODS production in Lebanon. Measures are being done to phase out ODS consumed in the industrial sector. Some activities are taking place to protect forests and marine resources through the establishment of protected areas

¹ Intergovernmental Panel on Climate Change

(seven protected areas by law, and other areas by ministerial decree) and regulating the fishery sector (e.g. ban of dynamite use). Unfortunately, these activities are still not widely applicable, and lack an integrated strategy and an action plan to be put in place, adopted, implemented, and above all, to be enforced by the concerned national authorities.

Several landmark regulatory developments are set to improve ambient air quality in Lebanon in the coming years. First among these is the phase-out of leaded gasoline: according to Law 341/2001 on reducing air pollution from the transport sector, leaded fuel in passenger vehicles will be banned by July 2002. As of January 1st, 2002, there was already a LBP 2,000 price differential in favour of unleaded gasoline. A second landmark regulatory achievement is the new Emission Limit Values promulgated by MoE Decision 8/1 (2001).

To achieve compliance, MoE has developed a Compliance Action Plan. Verifying compliance requires national monitoring of both ambient air quality (continuous) and stack emissions (intermittent and spot checks). With technical and financial assistance from the city of Barcelona, Spain, the Tripoli Observatory for Environment and Development has established an air-quality monitoring laboratory. The Observatory is the first such initiative at the local level in Lebanon. The Observatory is equipped to test the compliance of vehicle exhaust gases and to perform continuous air quality monitoring (SPM, SO₂) at fixed locations. It routinely publishes air quality data. The air quality lab in Tripoli, though still understaffed and under-equipped, is an important milestone toward institutionalising air quality monitoring in Lebanon.

Meanwhile, several private institutions are also acquiring valuable equipment and laboratory units for monitoring air quality. For example, with funding from USAID, the AUB Faculty of Engineering and Architecture has acquired a mobile air quality lab. The lab can perform continuous monitoring of select air pollutants (PM₁₀, CO, HC, NO, NO₂, NO_x, O₃ and SO₂) and meteorological parameters (temperature, humidity, wind speed, etc.). While the AUB also has the human resources to implement continuous monitoring, it first needs to synchronize and coordinate its efforts with other public institutions, such as the Meteorological Service of Lebanon, the National Center for Remote Sensing, and possibly other research institutions.

Capacity-Building, Education, Training and Awareness-Raising: The GEF, the Interim funding mechanism to the Climate Change Convention, along with UNDP, funded the Climate Change enabling activity in Lebanon (1998-1999). This was done to build national capacity in order to fulfil its convention requirements. The Climate Change designed a brochure that was disseminated to the public at large, and schools in specific. The Methyl Bromide Alternatives Project is considered a demonstration project, encompassing a capacity building component targeting the local farmers.

Information: Due to the fact that the protection of the atmosphere is a newly introduced topic in the country, data was first collected from all concerned entities (e.g. universities, scientists, national NGOs, international agencies, and others) and then assessed in terms of quality and quantity. Information is also obtained through contracting consultants to collect data based on intensive field visits, interviews, questionnaires and research. Database is then constituted, maintained and updated through the offices of Climate Change and Ozone at the Ministry of Environment, the Remote Sensing Center (for satellite images), the Lebanese Meteorological Service and the private sector (mainly consultancy firms). National indicators on climate change, ozone depleting substances, and alternatives to Methyl bromide were developed by the Lebanese Environment and Development Observatory (LEDO). Information on the protection of the atmosphere can be obtained through the public library established at the premises of the Ministry of Environment, UNDP and UN-ESCWA libraries, publications of the Association Libanaise pour la Maitrise de l'Energie et de l'Environnement (ALME) (published in French and English), and websites such as Ozone Office: www.moe.gov.lb/moe/ozone, Climate Change: www.moe.gov.lb/moe/climate, UNDP website: www.undp.org.lb, ALME: www.almee.org. At the national level, data is disseminated through publications, brochures, awareness campaigns and exhibitions, participation in seminars and conferences, and

through newspapers and TV interviews. At international level, all reports and publications are forwarded to the Secretariats of Climate Change and Montreal Protocol, as well as funding agencies.

Research and Technologies: The Lebanese Meteorological Service undertakes major readings pertaining to atmospheric pollutants. However, the detection system used is not mobile and located in a geographic area that does not represent the characteristics of ambient air in Lebanon. In addition, pollution levels are mapped by the Remote-sensing Center, which show concentrations of air pollution all over the Lebanese territory. On the top of that, UV radiation measurement is still lacking in Lebanon, a matter that was reflected by the Ozone Office at the Ministry of Environment. More stations are needed to be located all over the Lebanese territory to form a network of stations that would be supported by the Lebanese Meteorological Service, the National Council for Scientific Research and the Ministry of Environment. In this respect, this latter acquired equipment for measurement of stack air emissions. Still, the formulation of necessary legal framework, proper enforcement of existing laws as well as conducting continuous awareness programmes are considered needs and priorities required to ensure atmospheric protection.

Financing: Until now, local assistance has been considered as an in-kind support taking into consideration the institutions participating in the National Committees. Financial contribution is minimal (in process of study for allocation). Private sources of financing are not applicable yet. Almost all funds pertaining to the protection of the atmosphere are allocated from international sources (GEF, Multilateral Fund for the Implementation of the Montreal Protocol through UNEP, EU, UNDP, etc.).

Cooperation: Cooperation is active with the Fonds Français pour l'Environnement Mondial (FFEM), GEF, UNDP, l'Agence Française pour le Développement (AFD), and other international funding agencies. Lebanon ratified the United Nations Convention on Climate Change in 1994. Since then all obligations pertaining to this convention were fulfilled, mainly the First National Communication Report executed within the framework of the Climate Change project. As for the Kyoto Protocol, the Lebanese Government is still studying the possibility of signature and ratification after the outcomes and mechanisms of the mentioned Protocol are being clarified. Lebanon is a signatory to Montreal Protocol. It is operating under the article 5, paragraph 1, of the Protocol since its consumption of ODS is less than 0.3 kg per capita.

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CHAPTER 10: INTEGRATED APPROACH TO THE PLANNING AND MANAGEMENT OF LAND RESOURCES

Decision-Making: The Ministry of Agriculture through The Green Plan, the Ministry of Public Works and Transport, and the General Directorate of Urban Planning, are key entities while the Ministry of Environment has an advisory role. The European Union, UNDP, UNDCP, FAO and NGOs, CBOs are also involved.

Programmes and Projects: The Lebanese Environment and Development Observatory (LEDO) developed a land cover / land use map for Lebanon to support research and decision-making relevant to planning and management of land resources. The Council for Development and Reconstruction initiated a land-zoning project at the national level. UNEP/MAP is funding a project related to Coastal Area Management.

Status: Several problems plague the land resources of Lebanon, most prominent of which is the lack of integrated planning and management. Salinisation from natural sources or as a result of irrigation is a major environmental issue for the future of the country. Ground water, which originates from highly calciferous limestone formations, is excessively used for irrigating the Bekaa. The irreversible reduction of vegetative cover followed by the disappearance of topsoil has resulted in desertification conditions in many areas. The unsustainable forms of land management, socio-economic policy and institutional factors are also a drawback. Crude studies have shown that localized excessive grazing in the South and North of Lebanon, in addition to the Bekaa have caused the degradation of pasture lands. Excessive construction in the coastal zone and Mount Lebanon is a major area of lack of sound integrated management of land resources in urban areas.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: One of the main problems in this area is the scarce database. The most recent is the State of the Environment Report (MoE 2001) and the Land cover / land use map (LEDO 2002).

Research and Technologies: No information available.

Financing: No information available.

Cooperation: There is no specific international, regional or bilateral programme on integrated approaches to planning and management of land management. Some on-going projects indirectly lead to integrated land management such as the Coastal Area Management Programme and the EU vegetation programme. International programmes with NGOs and CBOs focus on terracing and reforestation such as \$2 million from EU for a vegetation programme, \$2 million on average per year from FAO, UNDP, UNDCP combined. Additional funding is provided by the World Bank and UNEP/MAP.

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CHAPTER 11: COMBATING DEFORESTATION

Decision-Making: Decision makers include the Ministry of Agriculture, the Rural Development and Natural Resources Directorate, and the Green Plan. The Ministry of Agriculture is responsible for the Integrated Capacity Building 5-Year Plan that was prepared in collaboration with FAO and other donor organisations, the private sector and NGOs. Tree nurseries were created in the different Mouhafazas and a decree was issued that prohibits cutting trees. Fine payments and even imprisonments are possible in case of violation. Towards the end of this program, ten million plants are expected to be available annually as of 1998. In addition to government organizations, NGOs, CBOs, and the private sector account for a large part of the efforts.

Programmes and Projects: Whereas national reforestation campaigns were previously the responsibility of the Ministry of Agriculture, the yearly government allocation of LBP5 billion (about US\$3.3 million) was in 2001 transferred to the MoE, renewed annually for a period of five years. This budget allocation is significant in comparison with MoE's own budget (US\$1.7 million in 2000).

Several other reforestation efforts are currently operating. For example, in 1998 in Bsharre, homeland to the relic Cedars of Lebanon, the "Committee for the Friends of the Cedars" launched an 18-year reforestation project. The committee secured seed money from *Iles de France* and currently manages a plant nursery, which can produce up to 25,000 saplings per year. The municipality donated 226 hectares for establishing a new cedar forest, using saplings from the nursery. After planting, follow-up and maintenance is secured by a tree adoption program. Project sponsors and supporters pay up to US\$100 for every tree planted; this contribution guarantees 18 years of maintenance (watering, weeding, protection). In addition, the trees are name tagged after their sponsor who also receives a certificate.

Status: Forests in Lebanon are a high national priority. Forests cover less than 6% of the country's surface. In 1982, FAO estimated the country's need for new forests to be equivalent to 200,000 ha. This would increase the forest area from 6% to 20%. On the occasion of the World Day to Combat Desertification in 1995, the Minister of Agriculture announced an ambitious five-year programme of reforestation of 40,000 ha. Forests suffer considerable destruction as a result of forest fires. Unless an integrated plan to combat forest fires is set up, reforestation efforts may not be effective. Around 1,200 ha of forest trees are lost every year because of fire, cutting and urban encroachment.

In the 1960s, the GoL put in place a "Project for the Improvement of the Lebanese Mountains". This national project focused on three major activities: land reclamation (i.e., terracing and agricultural roads), irrigation (i.e., hill lakes and distribution networks), and reforestation. The Green Plan, a separate authority under the Ministry of Agriculture, implemented these activities. During the period 1960-1975, large-scale reforestation projects were initiated with the establishment of mixed stands, including conifers, and the creation of forest nurseries. For example, in the Chouf Mountains, reforestation was undertaken to cedar forests (e.g., Maaser el Chouf, Barouk, and Ain el Zhalta). Unfortunately, planned thinning and plot management were interrupted by the war. Today, the trees are densely aligned and stunted.

A review of scattered reforestation activities over the past 10-year, as reported by the media, indicates that several NGOs, working with government agencies and with the support of local and international donors, undertook many reforestation campaigns throughout Lebanon. While these efforts are significant socially, their impact on total forest cover is negligible. Although there is no reliable information on the scale and impact of these campaigns, the survival rate for transplanted trees is believed to oscillate between 10 and 40 percent, at best.

Capacity-Building, Education, Training and Awareness-Raising: Annual reforestation campaigns also take place through NGOs and CBOs and with support from the private sector.

Information: The Ministry of Environment and the Ministry of Agriculture are responsible for the collection and dissemination of information.

Research and Technologies: No information available.

Financing: Government and private funding are the two main sources of financing in combating deforestation.

Cooperation: No information available.

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CHAPTER 12: MANAGING FRAGILE ECOSYSTEMS: COMBATING DESERTIFICATION AND DROUGHT

Decision-Making: The main decision-making bodies are the Ministry of Agriculture and the Ministry of Environment. With support from FAO and UNDP, a National Secretary for the Convention to Combat Desertification was recruited and then a National Committee to Combat Desertification was formed, supported by UNDP. Laws have been issued by various Ministries to combat tree cutting and overgrazing. Law enforcement and awareness in this area is generally weak, although some increased activity in tree cutting law enforcement has been occurring. The National Committee to Combat Desertification includes representatives from the Ministry of Agriculture, the Ministry of Environment, NGOs, scientists and experts from FAO and UNDP. A strategy and an action plan to combat desertification are in the process of being formulated.

Programmes and Projects: With grant funding from the German Agency for Technical Cooperation (GTZ) and co-financing from the MoA and ACSAD, Lebanon is implementing a project for *Combating Desertification in Lebanon* (CoDel). CoDel will assist the GoL in developing a National Action Programme (NAP) to combat desertification pursuant to its commitment to implement the United Nations Convention to Combat Desertification (the GoL ratified the UNCCD on 21/12/1994). CoDel effectively started in June 2000 and project partners include ACSAD, the MoA and the National Centre for Remote Sensing (NCRS). The project will (1) build institutional capacities, (2) identify desertification prone areas using GIS and remote sensing, (3) raise awareness on the issue among decision makers, the general public and communities of affected areas, (4) implement pilot interventions in affected areas, and (5) draft a NAP for combating desertification.

To date, CoDel has elaborated a map of priority areas for combating desertification in Lebanon based on the synthesis of several indices (vegetation, soil, land use, climate, and socio-economics). It has initiated several practical measures to combat desertification or rehabilitate degraded lands. For example, rangeland rehabilitation is being piloted in Aarsal (North Bekaa) using legume seedlings; a vast reforestation campaign is being implemented in Kfar Houne (Jezzine); and in Sultan Yaacoub (West Bekaa), CoDel is assisting the Litani River Authority in improving groundwater recharge through soil and water conservation measures. In addition, CoDel is providing technical training to several staff of the MoA and the NCRS, as well as supporting several on-going awareness campaigns in local schools.

UNDP initiated a project that is to develop an action plan to combat desertification in Lebanon. The project is in its initial stages of implementation.

Status: It is estimated that sixty-five of Lebanese lands are seriously affected by erosion from wind, temperature change, and human activities. Additionally, the cultivated areas have dropped during the period of war from 360,000 ha to 200,000 ha. The long years of unplanned land use in the coastal zone as well as in the mountain area, caused grave damage to natural resources. Deforestation, desertification, and drought vary from one area to another depending on climate, the level of unplanned urbanization, and the pervasiveness of detrimental economic and social activities. The main causes for land degradation are the abandoning of land, migration, involuntary displacement, encroachment of residential development and unplanned urbanization, overuse of ground water for irrigation, the abuse of chemicals (especially pesticides), changing agricultural practices that lead to degradation of terraced lands, and overgrazing of livestock leading to soil erosion and desertification and lack of integrated planning and management.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: No information available.

Financing: The Government is the main domestic source of financing for the various projects.

Cooperation: The International Convention to Combat Desertification in Countries Experiencing Drought and/or Desertification, Particularly in Africa was signed in 1995 and ratified in 1996. The FAO and UNDP are helping in raising awareness. The World Bank /IFAD also help with rehabilitation of irrigation schemes. Support from the EU, various UN Agencies, GTZ, and Regional Organisations aids the financing of projects.

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CHAPTER 13: MANAGING FRAGILE ECOSYSTEMS: SUSTAINABLE MOUNTAIN DEVELOPMENT

Decision-Making: The Ministry of Agriculture, through the Rural Development and Natural Wealth Directorate oversees this issue. Additionally, the Ministry of Public Works and Transport has authority through the General Directorate of Urban Planning. Also involved are the Ministries of Environment, Displaced, Energy and Water, CDR, the private sector, and UN organizations.

Programmes and Projects: See under **Status**.

Status: The major mountain systems in Lebanon are Mount Lebanon range to Litani excluding southern mountain area: 480,000 ha, Anti-Lebanon area: 187,000 ha, South Lebanon (upper Galilee, Jabal Amel): 70,000ha. Mountain areas development is administered through national reconstruction plans. No specific programme is geared towards mountain areas in particular, but rather to rural areas in general (though mountain areas are mostly rural areas). Figures for indicators pertaining to mountain issues per se are almost non-existent, particularly in such areas as flooding, land slides, etc. Social programmes going on in Mountain areas are irrigation schemes through MoA, CDR executed school rehabilitation, Ministry of Health constructing new hospitals and Ministry of Energy and Water renovating water and electric networks. USAID is executing development projects in mountain areas.

Capacity-Building, Education, Training and Awareness-Raising: Some steps are being taken to raise awareness among the population regarding general environmental awareness. A separate joint project for public environmental education by UNIDO/UNESCO/FAO exists. There are some social, economic, and cultural incentives for farmers in mountain areas to undertake conservation. The tree nurseries and agriculture cooperatives of the Ministry of Agriculture provide farmers with seedlings, plants, and fertilizers at low prices. Reforestation and public environmental awareness activities are progressively increasing through environmental NGOs and schools in collaboration with local communities.

Information: No information available.

Research and Technologies: No information available.

Financing: The Government is the principle domestic source of financing.

Cooperation: USAID and various international organisations help finance sustainability projects related to mountain development.

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CHAPTER 14: PROMOTING SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT

Decision-Making: The Ministry of Agriculture (MoA) and The Rural Development and Natural Wealth Directorate are responsible for agriculture. National and International NGOs and UN organizations are also active.

Programmes and Projects: In terms of rural development, MoA is implementing a \$5.5 million internationally supported integrated rural development programme to provide small and medium-scale farmer assistance which would lead to sustainable human development through start-up activities. These activities include the improvement of health, social services, education, and income-generating non-agricultural activities. The Council for Development and Reconstruction is initiating a rural development project. USAID is working in this domain within selected rural clusters, as well as UNDP, who initiated a project on Capacity Building for Poverty Alleviation. Several NGOs are also active in this respect.

Status: Three broad areas exist where agriculture practices are having undesired adverse effects. They include: the misuse of water (the present use of irrigation water is inefficient with high losses and wasteful applications to most crops), the misuse of agrochemicals (agrochemicals misuse constitute a serious health hazards with an urgent need for pesticide control through law enforcement), and the misuse of fertilizers. Fertilizers pose a less serious health hazard, but their use appears to be haphazard and may be contaminating water resources and soil erosion from land abandonment and overgrazing. Farmers in rural areas need capacity-building to upgrade their farming practices in a manner that would render them more economically and environmentally viable, including organic farming practices.

Capacity-Building, Education, Training and Awareness-Raising: Farmer capacity and awareness building is ongoing. In rural areas support for groups like women is provided to help prevent migration to urban areas. Additionally, through UNDP, international assistance to local NGOs is helping vulnerable groups such as women and the disabled. NGOs like the YWCA have programmes of their own with similar goals. YWCA-USA has provided YWCA Lebanon with a \$50,000 fund for rural area support.

Information: The Ministry of Agriculture, USAID, and UNDP are actively involved in the collection and dissemination of information in this area.

Research and Technologies: No information available.

Financing: The Government is the principle source of domestic financing with regards to this development issue.

Cooperation: USAID, various UN Agencies, and the World Bank help fund Lebanese efforts to promote sustainable agricultural and rural development

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CHAPTER 15: CONSERVATION OF BIOLOGICAL DIVERSITY

Decision-Making: The Ministries of Environment and of Agriculture are both decision makers in this area, and this has created conflicts of authority. The same applies to the management of protected areas. Unfortunately, staffing at MoE and MoA is limited, perhaps due to unattractive salaries for professionals. The NCSR and NGOs are also involved. Considering interest in recovering its role as a regional tourism destination, Lebanon has also signed the International Convention for the Protection of the World Cultural and Natural Heritage. Enabling activities were initiated to prepare a national strategy and action plan. Besides the convention on biological diversity, Lebanon has also ratified the Convention to Combat Desertification, the Ramsar Convention, and the Protocol concerning Mediterranean specially protected areas. Lebanon is also working on the ratification of the AEWa agreement, and has developed several laws and decrees pertaining to the protection of Biological Diversity.

Programmes and Projects: The Protected Areas Project began work on 15 November 1996 at the Ministry of Environment. The project has to put into place an effectively managed system to protect endemic and endangered species and incorporate biodiversity conservation as an integral part of sustainable human development. The project includes three areas: 1) Arz El-Shouf (Cedars), 2) Horsh Ehden Forest, and 3) Palm Islands. The International Union for the Conservation of Nature Resources (IUCN), other NGOs and CBOs support the project and are involved in monitoring and management.

The Ministry of Environment recently secured a top-up fund for the biodiversity enabling activity project. The aim of this project is to assist the Ministry to further assess national capacity building needs and priorities. During this 10-month project, the MoE will also analyze institutional and functional capabilities and determine the necessary mechanisms to protect national biodiversity.

Other initiatives include the Dryland Agrobiodiversity Project (UNDP/GEF), MedWet Coast project for the conservation of wetlands (UNDP/FFEM), the Darwin Initiative on Coastal Vegetation (AUB), and the Strategic Action Plan for Biodiversity (MAP/MoE).

Status: Lebanon signed the Convention on Biological Diversity (CBD) in 1992 and ratified it in 1994 (Law No. 360/94). Under Article six of this convention, Lebanon was required to develop and implement a national strategy and an action plan for the conservation and sustainable use of biological diversity. It should also “integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programs and policies.” Furthermore, under Article 26, Lebanon should present to the Conference of Parties regular reports on measures taken to implement the provisions of the convention.

Lebanon prepared the 9-volume country study on “biological diversity in Lebanon”. The report identified 9,119 species, roughly equally distributed between fauna and flora species. This number, however, is believed to represent only 20 percent of the actual number of species in Lebanon and hence the need to pursue and intensify research further.

With the collaboration of the UNDP and GEF, the MoE, in November 1998, developed a National Strategy and Action Plan for Biodiversity Conservation (NBSAP). The Action Plan then included specific recommendations to achieve these goals on the short, medium and long term. With support from UNDP/GEF, the MoE prepared the first national report on biodiversity and submitted it to the Conference of Parties of the Convention on Biological Diversity in November 1998.

Capacity-Building, Education, Training and Awareness-Raising: The Ministry of Environment, supported by international projects and organisations, has been quite active in raising awareness relevant to biodiversity conservation. All the above-mentioned projects and programmes have awareness and capacity building

components. The protected areas project worked on building capacities of NGOs and local authorities for the management of protected areas.

Information: Studies on the biological diversity of Lebanon (undertaken by the MoA with the assistance of UNEP) have been completed. The results of these studies were published in 9 volumes in January 1997. The library of the Ministry of Environment contains all the documentation relevant to projects, programmes and initiatives that tackled biological diversity conservation at the national level.

Research and Technologies: Academic institutions are very active in research relevant to biological diversity conservation. The National Council for Scientific Research conducts regular research pertaining to the subject, and was involved in the biodiversity studies of the protected areas in Lebanon.

Financing: No information available.

Cooperation: Lebanon cooperates with UNDP, GEF, IUCN, EU and NCSR. Financing was received from UNDP/GEF for the protection and administration of three protected areas, as well as for the Biodiversity Enabling Activity. FFEM provided funding for the conservation of two wetlands. Academic institutions in Lebanon mobilize considerable funds for research on biodiversity conservation. In general, various International Organisations, and International and regional NGOs provide funding for sustainability projects and programmes.

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CHAPTERS 16 AND 34: ENVIRONMENTALLY SOUND MANAGEMENT OF BIOTECHNOLOGY AND TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGY, COOPERATION AND CAPACITY-BUILDING

Decision-Making:

Technologies: There is no national policy on Environmentally Sound Technologies (ESTs). The Ministry of Environment promoted cleaner production and tries to identify alternatives for substitute technologies in all areas of Lebanese industry. The Ministry of the Environment established a focal point to coordinate regional and international efforts in December 1996. The Trade Information Center at the Ministry of Economy and Trade and the Sustainable Development Networking Programme have both been funded by UNDP and received large national interest and interaction.

Biotechnologies: The National Council for Scientific Research (NCSR) is the main supportive institution for biotechnology research in Lebanon.

Programmes and Projects:

Technologies: The Programme on Fiscal Reform and Administration (UNDP/CIDA) and the National Administrative Rehabilitation Programme (NARP) have both been initiated. The NARP seeks to implement technologies in 32 ministries and in public administration. The Ozone Office is promoting and transferring sound technologies that are ozone friendly. The Ministry of Environment is initiating a Cleaner production Center Project (EU Funding).

Biotechnologies: No information available.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies:

Technologies: Efforts to facilitate the transfer of environmentally sound technologies (ESTs) to small and medium sized enterprises include UNIDO clean technologies workshop (1996) and its follow-up. UNIDO, the European Union, and others are assisting the Lebanese Norms Institute to introduce the ISO 14000 series issues at the level of the private sector organizations and concerned line ministries (mainly Ministry of Economy and Trade and MoE). ESTs are most urgently needed in areas such as industries, transportation, power generation sector and waste management. Large industries in Lebanon are undertaking, as a private initiative, major rehabilitation plans to install cleaner technologies. Four industries in Lebanon have obtained the ISO 14000 certification.

Biotechnologies: There are around 15 research projects, undertaken at the American University laboratories, dealing with agriculture, medicine and biochemistry. St. Joseph University also has several research projects in the Medical Department.

Financing: No information available.

Cooperation: No information available.

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CHAPTER 17: PROTECTION OF THE OCEANS, ALL KINDS OF SEAS, INCLUDING ENCLOSED AND SEMI-ENCLOSED SEAS, AND COASTAL AREAS AND THE PROTECTION, RATIONAL USE AND DEVELOPMENT OF THEIR LIVING RESOURCES

Decision-Making: Several ministries and institutions are involved with coastal zone management issues, namely: Ministry of Environment, Ministry of Public Health, Ministry of Public Works and Transport, Ministry of Agriculture, the Council for Development and Reconstruction, and concerned Governorates and Municipalities. Added to that, other institutions such as the "Conseil Exécutif des Grands Projets" and the Investment Development Authority of Lebanon. In the area of marine environmental protection, both from land-based activities and from sea-based activities, the responsible authorities are the Ministry of Environment, Ministry of Public Works and Transport, Ministry of Agriculture, Ministry of Public Health and the Marine Center for Scientific Research. On the other hand, the Code of Environment, which is currently in the Parliament for adoption, is establishing the basis for a Higher Council of Environment. This Council will be mandated to ensure facilitating co-ordination among all public, private, scientific, and non-governmental bodies.

Lebanon is a party to the Barcelona Convention and its five protocols. The Convention includes an action plan and guidelines for the Protection of the Marine Environment and the Sustainable Development of the Coastal Areas of the Mediterranean, to be adopted on the national level. It is worth noting that the Code of the Environment, which is currently under discussion in the Parliament, includes the guidelines for a sustainable coastal zone management as well as the concept of all ratified conventions, international laws and standards. The Tourism Plan for Development and Reconstruction (1996) prepared by UNDP and The World Tourism Organization addressed coastal zone management. It recommended the coastal freezing development for one or two years until a coastal master plan is established. With respect to the role of Major Groups in decision-making, oceans and seas issues are still limited to government level in the decision making process. As for the municipalities, their involvement in the decision making process is still very limited.

Programmes and Projects: The Biodiversity Enabling Activity Programme, implemented at the Ministry of Environment, developed a national strategy to conserve, study and use the biological diversity in sustainable ways. The strategy that was achieved in November 1998 includes a chapter on the conservation of marine ecosystems (including marine living resources) and the protection of the Coast. A programme for the protection of marine water from land-based sources is currently under way to be formulated within the framework of activities of the REMPEC/ MAP. The Council for Development and Reconstruction set up the Integrated Coastal Zone Management Programme. The MedWet Coast project is working on the protection of marine living resources in Tyre Beach (reserve declared by law) mainly from land-based sources. A Coastal Area Management Programme (CAMP) was initiated at MoE in the context of the Mediterranean Action Plan activities. The Ministry of Environment also developed a National Plan for Industrial Waste Management. The Ministry of Environment declared two coastal areas as nature reserves by law.

Status: Lebanon's coast is about 250 km long. Urban areas stretch over 50 km of the coastline (21%), while beaches and dunes cover a total length of about 49 km (20%) and bare rocky outcrops about 11% (4.7%). Coastal central Lebanon comprises 63% of the population of the coastal zone, North Lebanon 23% and the South of Lebanon 14%. The percentage of the economy contributed by fishing and methods in place to encourage sustainable use and conservation of marine living resources. Fishing statistics are rare. Fishing in Lebanon is entirely artisanal or traditional. Dragnet, trawl line and fishing lamps are the main fishing equipment used, even though law prohibits trawl line. The Lebanese fisheries have suffered considerably during the war. Explosives and toxic bait (lindane) were regularly used. Analysis of the population dynamics of pelagic and semi-pelagic fish has shown high death rates and very low average weights due to over-exploitation. Until now, no direct methods adopted by the Government were put in place to conserve marine living resources, however, since the end of the war, the use of explosives has diminished dramatically due to the Lebanese Army's control. In addition, fishermen

in the South cannot venture out at the sea for security reasons, a matter that helped indirectly in replenishing fishing stocks.

Planning and execution of wastewater treatment plants is underway, and this is prime in preventing the disposal of raw sewage into the sea. The Ministry of Environment (in collaboration with SPASI/UNDP) developed standards for wastewater discharges.

Capacity-Building, Education, Training and Awareness-Raising: In 1998, a guideline decision was designed by the Ministry of Environment to assist industries in combating pollution especially liquid effluents that go into the sea (mainly cement and fertiliser factories). Implementation of this guideline-decision is improving. In 1998, the Ministry of Environment, environmental NGOs, schools and universities conducted The Big Blue Campaign. This Campaign is conducted every year to raise awareness for the safeguard of the Mediterranean Sea in general, and the Lebanese Coast in specific. Other minor campaigns were conducted in parallel by scouts, Red Cross, municipalities and concerned NGOs. SOS Environment (a local NGO) conducted an environmental educational training course called "Blue School", which focused on the importance of conserving marine living resources. This course was conducted in collaboration with the World-Wide Fund (Italy). Greenpeace conducted water analysis for industrial pollution all along the coast.

Information: The available information regarding the fishery sector in general could be obtained from the Ministry of Agriculture website (<http://www.agriculture.gov.lb>). The biological diversity report (prepared by the Ministry of Agriculture), includes data about terrestrial fauna and flora, marine and coastal flora and fauna, aquatic fauna and flora, agricultural and livestock habitats, nature reserves, and socio-economic factors affecting the biodiversity. The complete report is available on the website. Geographic Information Systems have been used in various coastal management projects, including the regional environmental assessment report on the Coastal zone of Lebanon, and has produced GIS ARC/INFO land use maps, based on the CORINE nomenclature. The Protected Areas GEF programme is currently producing land use maps for the natural reserves of Barouk Cedars, Horsh Ehden and the Palm Islands reserve. The Remote Sensing Center, affiliated to the National Council for Scientific Research, produced several types of GIS maps concerned with water pollution, green cover, etc. Private consulting firms used GIS for studies on coastal land use and industrial distribution. The National Council for Scientific Research is conducting a programme for Coastal Zone Marine Management that aims to develop an ocean data and fleet operations management systems.

Research and Technologies: No information available.

Financing: This programme area is financed by National budget of concerned ministries and the National Center for Marine Research (whose budget is allocated from the National Council for Scientific Research; however, this budget is very limited and insufficient).

Cooperation: Lebanon is a party to agreements such as: the Barcelona Convention plus five protocols; the United Nations Framework on Biological Diversity; the Ramsar Convention on Wetlands of International Importance Especially Waterfowl Habitat; The United Nations Convention on the Law of the Sea; The MARPOL Convention, Annex I and II; United Nations Framework Convention on Climate Change; The Paris Convention concerning the Protection of the World Cultural and Natural Heritage; BASEL Convention; MEDPOL activities in the framework of the Mediterranean Action Plan (land based activities); and the Convention on Biodiversity. External assistance includes funding by the World Bank, the Japanese government, the European Investment Bank, UNEP/MAP, EU etc. Additionally, there exists the GEF Project on Protected Areas and FFEM Project for the management of wetlands in the Mediterranean.

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CHAPTER 18: PROTECTION OF THE QUALITY AND SUPPLY OF FRESHWATER RESOURCES: APPLICATION OF INTEGRATED APPROACHES TO THE DEVELOPMENT, MANAGEMENT AND USE OF WATER RESOURCES

Decision-Making: The following are involved in the coordination of water resources management and development: the Council of Ministers, the Council for Development and Reconstruction (CDR), the Ministry of Energy and Water (MoEW), and the Litani River Authority (which oversees water resource management in the Litani river basin). MoEW is responsible for setting national policies, new major equipment, feasibility studies, and new water supply networks. Water resource management is also under the responsibility of twenty-two district water authorities, which oversee all water resource management issues within their respective jurisdictions. Enforcement of existing laws is lacking. Efforts were made at the Ministry of Environment to set standards for liquid effluents from industrial facilities, and enforcement will hopefully begin in the near future. At present, there is no national plan for integrated land and water management and development. No integrated policy for water supply related to economic development promotion currently exists.

Some industrial facilities (and hospitals) do have water meters installed. For household use, the current pricing policies are to have one unified price/cubic meter/day for all household connections within a given water authority's jurisdiction. This fixed water quantity is set through a water gauge. Plans exist to install water meters to house connections whereby pricing will reflect individual household usage rather than fixed per day water supply. Price scales will reflect investment recovery. It must be noted, that installing water meters on a mass scale to households entails technical difficulties, which need a long time to overcome. Current policies do not take into account poverty. It is notable that the price of water is low within all water authorities compared to international standards. Additionally, the existence of illegal connections to the public networks is widely practiced in poor areas.

In general, there are no mechanisms to provide for the participation of major stakeholders in decision-making for water management. The Ministry of energy and Water sets policies, and consultations infrequently occur with some industrialists and farming cooperatives. Participatory mechanisms are required for the implementation of assistance programs, e.g. through UNICEF or USAID, and only within these programmes do participatory and conflict resolution mechanisms exist. The private sector is involved in water management only through consultants, which conduct assessments and studies for government agencies. This sector could have a wider role when the new water authority set-up is initiated. This new set-up allows for water authorities to subcontract water resource management to the private sector.

Programmes and Projects: No information available.

Status: Freshwater is a top national priority in Lebanon. Water, particularly its quantity, is the most politically sensitive environmental issue facing Lebanon and the whole Middle East Region. It should be noted that the Litani is the only major river in all the Near East not crossing national borders. The Lebanese Government tightly guards water issues. Annual withdrawals of ground and surface waters are forty percent of all available water or 900 million m³. Domestic consumption of water is 60 litres/day/capita. Much of the water supply is only chlorinated or not treated at all in cases where it is withdrawn from the ground water. Overall, modern water treatment facilities are needed for surface and ground waters. The Lebanese government does have plans to enlarge the water supplies available to the population through the transport of water through pipelines, such as the additional supply planned for Beirut from the Awali River. At this time, there is no true wastewater or sewage treatment at all in the country. Several primary treatment facilities with sea outfalls have been earmarked for the coastal zone. Secondary treatment plants have been earmarked for inland areas where the effluent from these plants will be used for specific agricultural uses. Technologies for primary and secondary treatment, trunk sewers, and house connections are needed. Moreover, the government is in the process of building dams in several areas around the country.

Capacity-Building, Education, Training and Awareness-Raising: There are no programmes to raise awareness or enforce the conservation of fresh water. UNICEF and NGOs run occasional campaigns on this issue, while CDR is making progress in reducing losses in existing networks. Getting people aware of the importance of water conservation on a per capita basis would require changing long held water consumption habits and is considered a major challenge.

Information: UNICEF, in collaboration of AUB, conducted a major effort for bio-chemical monitoring of Lebanon's water sources. 70% of Lebanon's fresh water sources were found to be subject to bacteriological pollution, mainly due to household effluents and industrial pollution. Samples for measurement are being collected every two weeks through AUB and the Department of Environmental Health. Also BOD in water bodies is measured every two weeks. Results will be available in June 1998 after a whole year of sampling. All water information is collected by the various water authorities under the direct supervision of MoEW, and to a lesser extent other government agencies such as CDR. Needs assessments are based on projection built on international norms of usual consumption patterns. The main sources of data for the evaluation of water resource quantities in the country are based, to a large extent, on desk research and literature review of sources prior to 1982. Empirical research is still lacking detailed analytical information covering comprehensive inventory of water resources, particularly in ground water. Thus, the water budget is one of the major issues of political/economic debate with various studies producing surpluses or deficits in this budget. Information is rarely distributed to the general public; concerned ministries would have access to information at the MoEW. However, information is available through academia such as the Ecole Superieure des Ingenieurs de Beyrouth (USIB) water centre. Information on water quality management is available through UNICEF and The American University of Beirut. The National Council for Scientific Research (NCSR) also distributes whatever information is made available to it.

Research and Technologies: No information available.

Financing: Since 1992, \$500 million has been spent to improve water supply, another \$670 million has been requested for this purpose. In addition, \$520 million has been requested for dams and water transport facilities and \$735 million for wastewater treatment.

Cooperation: From 1992 to 1997, a total of \$320 million has been granted from external sources to improve water resources management and development. This is 64% of all expenditures in this area. Assistance was provided from the World Bank, the European Investment Bank, the Arab Fund, as well as from the Governments of Kuwait, France and Japan.

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CHAPTER 19: ENVIRONMENTALLY SOUND MANAGEMENT OF TOXIC CHEMICALS, INCLUDING PREVENTION OF ILLEGAL INTERNATIONAL TRAFFIC IN TOXIC AND DANGEROUS PRODUCTS

Decision-Making: The Ministry of the Environment (MoE) is the lead agency in decision-making. Implementation is a collaboration between MoE and the Ministry of Industry. The Lebanese Industrial Association is also involved, as is the customs agency.

Programmes and Projects: With grant funding from METAP/World Bank and the Italian Government, the MoE implemented a one-year hazardous waste management project. The project worked on assessing the yearly quantities of hazardous waste generated in Lebanon, recommended a strategy for the sound management of hazardous waste and developed hazardous waste legislation that was approved by the parliament.

Status: Toxic chemicals are a high national priority in Lebanon. Large quantities of toxic chemical substances are imported into the country for national use in industries. The management of these substances is limited to customs and MoE at points of entry. All other operations that follow do not conform to international standards and are poorly managed. There is sufficient staffing and lab equipment in the private sector, but these resources are not being used due to lack of regulations. For these reasons, Lebanon has a major problem related to toxic waste management. Most if not all of the industrial waste generated in Lebanon is managed with little or no environmental controls. Industrial solid waste continues to be either co-disposed with the municipal solid waste in the country's landfills and dumps or otherwise dumped into the environment, either directly or indirectly through sewer networks.

Capacity-Building, Education, Training and Awareness-Raising: The above-mentioned project trained MoE staff, other stakeholders and concerned groups on the safe handling and management of hazardous waste. Training also included hazardous waste classification, storage, packaging and labelling, permitting requirements, waste transportation manifests, as well as data collection and management. Information manuals were prepared and disseminated through seminars and workshops, to raise awareness of the dangers of hazardous waste and its improper handling.

Information: This is the role of the Ministry of Environment.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: No information available.

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CHAPTERS 20 TO 22: ENVIRONMENTALLY SOUND MANAGEMENT OF HAZARDOUS, SOLID AND RADIOACTIVE WASTES

Decision-Making:

Hazardous wastes: The Ministry of the Environment (MoE) is the lead decision-maker and customs collaborates with MoE on enforcement at entry points. International NGOs (Green Peace), local NGOs and the media participated in bringing up the issue of hazardous waste through daily follow-up and public awareness campaigns. With the support of Green Peace, Green Line (a local NGO) issued a book on hazardous waste and its dangerous impact on humans, animals and vegetation.

Solid wastes: The Ministry of the Environment (MoE) and CDR oversee solid waste. MoE, CDR and Ministry of Energy and Water are in charge of wastewater. The MoE plans to adopt the following for all solid waste treatment facilities: sorting for recycling, composting, bailing, incineration to a limited extent, and sanitary landfilling in compliance with geo-technical standards. The *master plan* includes the rehabilitation of wastewater drainage, which will mitigate the negative impacts of wastewater on ground water. Feasibility studies were undertaken and sewage networks were installed so far in few areas. Others are still using collection wells, which are a major source of ground water pollution. In both cases, treatment is non-existent.

Radioactive wastes: The National Council for Scientific Research (NCSR) has a mandate to formulate safety standards and develop regulations and procedures for importing, use and disposal of radioactive sources and to develop local capabilities for monitoring doses and radioactivity in humans and the environment. The Lebanese University is in the process of establishing a laboratory for nuclear analytical measurement.

Programmes and Projects:

Hazardous wastes: Outlined in **Chapter 19**.

Solid wastes: In the Greater Beirut Area (GBA), municipal solid waste has been managed in accordance with the 1997 Emergency Plan for Solid Waste Management by the private company SUKLEEN. While the basic features of the plan were implemented, key SWM indicators remain well below target, especially with regard to recycling and composting. Lower levels of recycling and composting have drastically reduced the projected lifetime of the sanitary landfill built under the Plan.

The Solid Waste Environmental Management Project (SWEMP), launched in 1996, was designed to provide solid waste management solutions outside GBA. SWEMP was supported by a loan secured by the GoL from the International Bank for Reconstruction and Development (IBRD). The loan agreement was initially worth US\$55 million for a three-year period (Law 504, dated 6/9/1995). The agreement envisioned the construction of about 15 sanitary landfills, the closure and rehabilitation of existing waste dumps, the construction of two composting plants (Saida and Zahle) and one incinerator for hospital waste. In 1998, a Project Coordination Unit (PCU) was set up at the Ministry of Interior and Rural Affairs to provide technical and administrative assistance to the CDR during project implementation. SWEMP was suspended in December 1999. Recently, however, the project has been re-initiated. At the same time, several community-based initiatives for SWM were launched in the past few years, some with remarkable success.

Radioactive wastes: No information available.

Status:

Hazardous wastes: Hazardous wastes have a high national priority for Lebanon. The extent of hazardous waste imported into Lebanon during the war varies depending on the source of information from several hundred to 17,000 barrels. More waste has been imported into the country in recent years. A portion has been located, while the remaining quantities have not been accurately determined. Aspects of hazardous waste in Lebanon include: -A bilateral agreement was signed between Lebanon and Germany to control import of used batteries in 1994 according to article 11 of the convention; In 1994, Lebanon faced the problem of the presence of 20 ethylacrylate barrels which were eventually exported to France; -Lebanon has a major problem concerning the industrial waste of

the Lebanese industries, especially because the necessary installation (recycling, etc.) for treatment of this waste does not exist; -The Lebanese Government passed the decree No. 22/1 dated 17/12/96 concerning the organization of plastic waste import according to the green, red and orange lists approved by the European Union; Recently, preventive measures for limiting traffic of illegal hazardous wastes have been strengthened. A Government decree has been issued limiting the import of several plastic substances not previously listed in the 1988 law on Hazardous waste. Various wastes have been confiscated which originated in developing countries; There is a lack of specialized experts and limited effective monitoring equipment; The expense of retrieval of imported hazardous wastes is provided by originating countries; Government financing is being provided for rehabilitation of hazardous waste dumps in Lebanon.

In cooperation with the MoE, the Lebanese Institute for Norms and Standards (LIBNOR) is preparing a study on norms and standards for the industry. The MoE, and through the hazardous Waste management Project (detailed in Chapter 19) undertook several initiatives in this respect.

Solid wastes: Solid and hazardous waste collection and disposal services were severely affected by the war. Solid waste collection equipment was either damaged through acts of war or has deteriorated due to ageing and lack of maintenance. As a result, and mainly outside Beirut, solid waste has been dumped indiscriminately along roadsides, in vacant lots and irrigation canals causing water pollution problems as well as blockages in the irrigation system. Existing solid waste disposal sites are overfilled and waste from those sites along the seacoast is often washed away by the sea. Industrial solid waste and medical waste are generally mixed with municipal refuse. Another critical problem is the illegal disposal of industrial hazardous waste from highly polluting industries (tanneries, paint, metal industry, etc.) and the disposal of thousands of barrels of hazardous waste imported during the war period. Solid waste collection in Greater Beirut and a few areas of Mount Lebanon has been resolved, however the management and treatment of the wastes has not been initiated yet and remains an urgent issue. The MoE recently came up with an emergency plan to close the Borj Hammoud dumpsite and the incinerator at Amroussieh. Waste collected within other Lebanese territories is monitored and contracted by local municipalities, in some areas waste collection has been awarded to private companies. The dumping sites at these areas are randomly selected and completely uncontrolled. Neither Environmental Impact Assessments nor Environmental Audits are being made in this domain. A Master Plan for Lebanon to properly manage the solid waste is of utmost urgency.

Radioactive wastes: No information available.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information:

Hazardous wastes: The Ministry of Environment.

Solid wastes: This is the role of the Ministry of Environment, CDR, SUKLEEN, and SWEMP.

Radioactive wastes: No information available.

Research and Technologies: No information available.

Financing:

Hazardous wastes: No information available.

Solid wastes: Projects are also financed by: the MoE, the World Bank, and the Independent Special Fund of Municipalities. The World Bank provided \$55 million and HRC provided \$22 million for solid waste. The EIB and Japan are also donors. \$400 million for sewage treatment has been requested from the Friends of Lebanon Conference

Radioactive wastes: The IAEA finances: \$131,000 for the NCSR for regulations projects; \$101,000 for the Lebanese University for lab capacity building.

Cooperation:

Hazardous wastes: The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was signed and ratified in 1994. The latest information was provided to the Basel Convention Secretariat in 1997. In March 1996, an agreement was signed by Mediterranean countries to eliminate twelve toxins including aldrin, chlordane, chlorinated dioxin and other toxic substances. With support from the World Bank and in cooperation with the MoE, the Council for Development and Reconstruction has commissioned a feasibility study on biomedical waste management. It is foreseen to set up a treatment plant for biomedical wastes with the help of international companies.

Solid wastes: No information available.

Radioactive wastes: No information available.

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CHAPTERS 24 TO 32: STRENGTHENING THE ROLE OF MAJOR GROUPS

Women: Decision-making: As a result of the Beijing Conference, a National Commission for the Advancement of Women was established by Governmental decree. UN agencies and the EU are supporting the development of a national strategy in cooperation with concerned NGO committees. The percentage of women in parliament is 2.3%. The number at the local government level is negligible. Policies or strategies are being drawn up for achievement of equality in all aspects of society. NGOs are exerting pressure in this respect, and a number of laws are being passed. Curricula promoting dissemination of gender-relevant knowledge are planned. Programmes and Projects: In 1996, the Ministry of Social Affairs launched the Strengthening Institutions for the Development of Women Enterprises project. The project now has a core of twenty trainers and business counsellors and has conducted nine training courses for women potential entrepreneurs, with 230 women and two men graduating. Status: Women in Lebanon hold the responsibility for 12.5% of the families. The educational system in Lebanon provides equal opportunities for women and men. However, women still represent only around 27.8% of the economically active population. Women in Lebanon have excelled in the media and communications field, as well as in other jobs that were previously solely occupied by men. Capacity-Building, Education, Training and Awareness-Raising: The Arabsalim Women's Association started a solid waste collection and recycling campaign in the South Lebanon. They began with composting organic wastes and training local community groups to sort plastic and glass for recycling. Cooperation: The Convention on the Elimination of All Forms of Discrimination Against Women was signed and ratified in 1996 with major reservations.

Children and youth: Status: Children and youth are ad hoc participants in the national sustainable development process. Regional and international cooperation in the form of youth fora does exist. One Parliamentary session was held where the Speaker of Parliament chaired a session in which children were given the opportunity to "act" as deputies. Under five mortality rate has dropped to thirty-two per thousand during the last decade, and infant mortality rate has dropped to twenty-eight per thousand. Vaccination against measles for children less than one year old increased from 68% to 81%. The number of day care facilities increased with the increased number of working mothers. A parliamentary committee for "mother and child" was established. The youth between ages of 15 and 24 represent 20% of the Lebanese population.. 30% of the youth are among the labour force, distributed among males (75%) and females (25%) A parliamentary committee for the youth was also established in 2000, as well as a Ministry for Youth and Sports. Capacity-Building, Education, Training and Awareness-Raising: Children and youth influence environmental awareness and sustainable development through school clubs and CBOs. Local NGOs provide youth fora and summer camps, and the youth represent a high level of activists, both at the political and social levels.

Indigenous people : No information available.

Non-governmental organizations : Decision-making: In 1994, eight NGOs established the Lebanese Environment Forum (LEF), which now undertakes projects such as reforestation, establishment of sanctuaries, restoration of old churches and mosques, in addition to awareness campaigns for protecting the environment. Member organizations hold monthly coordination meetings. The MoE and NGOs set up workshops and seminars to disseminate environmental information and increase public awareness. There now exist more than 130 environmental NGOs, and a considerable number of social and development NGOs. Environment NGOs have played a major role in the creation of the MoE, through lobbying and enhancing pressure. Since its early creation, the MoE sought for a long-term strategy of coordination among NGOs. It also realized the need for networking between NGOs and the Ministry. Several seminars were offered to provide NGOs with knowledge on lobbying, mobilizing funds and formulating projects to the MoE. Seminar objectives were identified through the Capacity 21 project. NGOs are always invited to participate in decision-making regarding public awareness, strategy plans and urgent issues such as hazardous wastes, quarries, and the protection of monumental and natural sites. Programmes and Projects: Most NGOs work on the collection and dissemination of environmental information and awareness material among schools, community groups and other NGOs. The Association for Forest Development and Conservation (AFDC)

initiated the Tree Nursery and Environmental Training Center in Aley Caza. The tree nursery provides 25,000 pine trees a year. The Environment Training Center will be the first of its kind in Lebanon. Capacity-Building, Education, Training and Awareness-Raising: Since the early 1970s, several NGOs have been established by researchers and scientists. Their main role has been to increase environmental awareness amongst the general public and to draw attention to pressing environmental problems and human health issues. In the early 1980s, NGO activities were rather theoretical, covering research and case studies on wild life, forests, rivers, flora and fauna as well as the marine environment. However, during the war, environmental concerns were inevitably considered to be a luxury. As the fighting decreased, public concern for the environment began to reappear and environmental NGOs were reformed. By the late 1980s, there were about forty institutions and societies throughout the Lebanon that were concerned with environmental issues. Their activities focused primarily on urgent local issues. In 1996, the local NGO SPNL established the Environment Information Center in Beirut, which provides different sources for environmental education such as books and training sessions for environmental educators. Several NGOs are now institutionalised and mobilize resources for the implementation of priority projects.

Local authorities: Status: During the war, local authorities became very weak. In many cases illegal military forces replaced local authorities by imposing taxes on people. At present there are only 107 active municipalities in Lebanon. The major problems, urban and rural municipalities face are those related to solid waste, sewerage, heritage, public health and urban planning. Rural municipalities also face problems with domestic and irrigation water and urban encroachment upon agricultural and forest lands. Nevertheless, some municipalities have initiated successful projects in the field of environmental management, particularly waste collection and recycling projects. Programmes and Projects: The UNDP capacity 21 project initiated the local Agenda 21 process in a number of municipalities in Lebanon. This was an innovative idea to get local authorities to integrate environmental concerns on their planning agendas. USAID has been working with local authorities, as well as other organizations, embassies, universities and active NGOs.

Workers and trade unions: No information available.

Business and industry: Decision-making: There are governmental policies increasing the efficiency of resource use, including reuse, recycling, reduction of waste per unit of economic output, etc. A few big enterprises have adopted sustainable development policies. MoE has a leading role in this respect. Status: Since 1994, private sector organizations repeatedly called for privatisation of public infrastructure and services. It was argued that the rehabilitation and operation of public utilities can be delegated to the private sector under arrangements and strict supervision with clear policies for pricing and marketing. The Government has continued preparatory activities towards restructuring public services, particularly in the field of electricity and telecommunications. To a large extent, reconstruction works are now in the hand of private companies. The company ELYSSAR carries out the redevelopment of the Beirut Southern Suburbs, a redevelopment programme with a budget of US\$2 billion, reconstruction of Beirut Central District was initiated through SOLIDERE, another privately owned company. Environmental Impact Assessments are urgently needed in these projects in order to ensure sustainable development. Strengthening the private sector is a governmental priority. The Lebanese Investment Development Authority (IDAL) vigorously promoted Lebanon with a view to attract private investment. It commissioned a number of studies and developed its project portfolio. The recent period witnessed the development of new bank products (personal loans, housing loans, etc.) aiming at the support of economic and social projects such as expansion, re-equipment and modernization of small-scale enterprises and the creation of micro enterprises and handicrafts by displaced. Several small industries have started recycling of paper, glass and plastic. However, they suffer from lack of advanced technologies and finance to ensure the durability of their projects.

Scientific and technological community: No information available.

Farmers: No information available.

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CHAPTER 33: FINANCIAL RESOURCES AND MECHANISMS

Decision-Making: The Government's short-term and long-term plans address substantively the rehabilitation of the infrastructure, which will have major positive consequences on sustainable development in general. The National Emergency Reconstruction Plan (92-95) and Horizon 2000 (95-2007) are the main national basis for domestic and external investment. Financing of these plans amounted to a gross total of \$31 billion. Financing source requirements include \$0.3 billion foreign capital grants, \$11.2 billion foreign borrowing, \$7.2 billion domestic borrowing and \$12.3 billion current budget surplus. External financing was allocated to the following sectors: Electricity (\$980 million); Water supply (\$286 million); Education (\$234 million); Water and solid waste treatment (\$207 million).

The Government's medium to long-term policy is to apply full cost recovery for environmental services and charges for environmental impacts. Discussions are underway to reduce subsidies in the electricity sector. Restrictions on the import of plastic wastes have been introduced and implemented. Regulations for petroleum storage facilities have been implemented.

Programmes and Projects: No information available.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: No information available.

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CHAPTER 35: SCIENCE FOR SUSTAINABLE DEVELOPMENT

Decision-Making: The National Council for Scientific Research (NCSR) is the main national body responsible for formulating the scientific needs and strategy and ensuring the best utilization of scientific resources for the public benefit. The NCSR is directly linked to the Council of Ministers and includes the following departments: Marine Research Center, Geophysics Research Center, Solar Energy Center; Remote Sensing Center; Information and Documentation Center; The Ministry of Environment, the NCSR and United Nations agencies such as UNDP facilitate dialogue among the scientific community, the Government and the public at large with respect to issues related to sustainable development. Academic institutions are playing a vital role in setting and implementing sustainable development strategies.

Programmes and Projects: No information available.

Status: The Lebanese scientific community has considerable human resources, but additional financial resources are needed to move forward with this sector.

Capacity-Building, Education, Training and Awareness-Raising: Academic institutions, especially the American University of Beirut (AUB), have developed several programmes and networks related to sustainable development. The Environment and Sustainable Development Unit (ESDU) at AUB is a platform for participation among relevant stakeholders on issues related to sustainable development and improved livelihoods.

Information: The Ministry of Environment, UNDP, and AUB have the role of collecting and disseminating information.

Research and Technologies: Many universities have developed expertise in the field of the environment and sustainable development and can be considered centres of excellence in the region. Research remains theoretical in many cases and lacks the backup of practical information, which cannot be obtained in many instances due to the lack of sophisticated analytical instruments. Some researchers are also returning to the private university where rates are improving; however, many national experts have remained outside the country where salaries are higher. Research is being conducted, e.g. on potable water and irrigation water. Extended research and data collection is taking place on major water bodies. The use and losses of water are also under study.

Financing: See under **Cooperation**.

Cooperation: Various bilateral and multilateral agencies are supporting NCSR and the Public Lebanese University and other private Universities. Vocational and Technical Education Expansion and the Public Lebanese University campus are being seriously considered by the Government and are estimated at a cost of \$400,000 and \$130,000 respectively. Financing will come from World Bank, EU, IDB, bilateral assistance such as Saudi Government and Sultanate of Oman. Other support has been channelled towards specific areas, for example: Germany assisted the Remote Sensing Center; IEAE supported the NCSR; USAID supported the American University of Beirut; AUPELF supported Francophone Universities; and MEDCAMPUS assisted in training Lebanese University.

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CHAPTER 36: PROMOTING EDUCATION, PUBLIC AWARENESS AND TRAINING

Decision-Making: Among Government organs, the Ministry of Environment, Ministry of Education, Ministry of Culture and Upper Education, Ministry of Agriculture, and a few municipalities are responsible for education. The "Centre du Développement et de la Recherche Pédagogique (CDRP)" is the main national body to prepare studies and formulate the educational framework and the school programmes. It is directly linked to the Ministry of Education. Non-Government actors include NGOs, CBOs, and others in the private sector. UNDP, UNICEF, and UNESCO collaborate with bilateral donors in some cases.

An environmental education strategy has been prepared which identifies ways of integrating environment at all levels of education (primary, secondary, university). The strategy stresses incorporation of environmental issues into all subject matter, rather than teaching separate environment courses. This is a joint effort between NGOs, Ministry of Education, Ministry of Environment, UNESCO and UNDP.

Programmes and Projects: Environmental Education has also been integrated in the Kindergarten level in the programme, which has been used as a demonstration for the new national curriculum and was implemented starting the year 2000. The Ministry of Environment has acquired EU funding to strengthen its Guidance and Awareness service. The project is expected to start in September 2002.

Status: Education is freely accessible to the poor in the country at all levels of education. The national development plan has earmarked rehabilitation of government schools as well as development of the educational systems (schools and universities) where many poor areas currently lack educational facilities and or human resources.

Included among Lebanon's accomplishments are:

- A joint proposal from the Ministries of Environment and Education to promote environmental education and awareness in schools;
- A new educational structure has been introduced in the year 2000 whereby environment issues are incorporated into all subjects of the school curriculum;
- Public activities, such as seminars and production of educational materials, are being undertaken by Environmental NGOs and CBOs with the support of the private sector and participation of the MoE;
- Training activities on environmental issues, which are organized by MoE in collaboration with UN Agencies and concerned Ministries;
- Training for local community groups has also been undertaken by environmental NGOs; and
- An environmental awareness strategy has been established and several campaigns with all the employment of the media have been conducted.

Several programmes run by the Government and NGOs and supported by aid agencies have been initiated "Operation Big Blue" administered by the Ministry of Environment to raise awareness on coastal and marine conservation and to undertake possible actions; conducted by NGOs, schools, universities, scouts, sport centres and private sector "Clean up the World Campaign" - celebrating national cleanliness day which included activities such as the cleaning of cities, towns and major road arteries. This campaign was conducted through a collaborative effort including NGOs, the Australian embassy, the Ministry of Environment and UNDP and solid waste sorting campaigns, which have the aim of raising awareness and initiating activities on this issue. Major participants are NGOs, the private sector, the Ministry of Environment and UNDP. Recently, the Go-Green activity was a private sector initiative to promote awareness on several environmental issues, and involving a broad segment of the population. Some more activities have been initiated in order to educate and raise awareness of families and local communities on sustainable development issues. Environment clubs now exist in many schools. The Ecobus, an NGO run activity, is promoting awareness by singing performances, plays, and lectures in all regions it visits. The Touring Environment Exhibition, an NGO activity, is a van with environmental exhibits, which is touring many

regions in Lebanon. "The Environment Days" administered by the Ministry of Environment and implemented by NGOs, schools, and universities. Another example is the training of "Health/Environmental Guides".

Further examples of innovative education, awareness raising and training activities for sustainable development are:

- "The Environment Information Center", managed by an NGO, the Society for Protection of Nature and Natural Resources in Lebanon (SPNL);
- "The School Gardens", training and development of nurseries in schools by kids, run by Green Line, an NGO; and
- "The Environment Education Center", which is a centre for training on various environmental issues, particularly capacity-building, reforestation and forest fire fighting. The centre also has nurseries for pine trees, and to a lesser extent cedar trees. This effort is conducted by "The Association for Forest Development and Conservation", an NGO.

Further efforts are underway by the Ministry of Environment and UNDP to strengthen networks with major organizations in the field of education and raising awareness, particularly with the followings: The Lebanese Environment Forum (NGO), The Green Forum (NGO), The International Chamber of Commerce (private business groups), and The Environmental Media Network.

One of Lebanon's leading newspapers, Al-Nahar, introduced a daily page for environment and heritage issues. The weekly supplement "Nahar of the Youth" also addresses human rights, education and environment issues. Most other Lebanese newspapers have introduced environment issues on daily basis. A monthly magazine "Environment and Development" started issuing in 1997. It 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. The Mediterranean Information Office for Environment, Culture and Sustainable Development (MIO-ECSDE), is reporting on educational issues to UNESCO's International Conference on Environmental Education.

Information: The Ministry of Environment, UNDP, Green Line, AFDC, and EIC all play an informational role.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: No information available.

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**CHAPTER 37: NATIONAL MECHANISMS AND INTERNATIONAL COOPERATION FOR
CAPACITY-BUILDING IN DEVELOPING COUNTRIES.**

This issue has been covered under the heading **Capacity-Building, Education, Training and Awareness-Raising** in the various chapters of this Profile.

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CHAPTER 38: INTERNATIONAL INSTITUTIONAL ARRANGEMENTS

This issue deals mainly with activities undertaken by the UN System.

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CHAPTER 39: INTERNATIONAL LEGAL INSTRUMENTS AND MECHANISMS

Decision-Making: No information available.

Programmes and Projects: No information available.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: No information available.

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CHAPTER 40: INFORMATION FOR DECISION-MAKING

Decision-Making: The Central Administration of Statistics (CAS) is a public institution affiliated to the Council of Ministers with the mandate to conduct statistical studies and figures. By-law, all governmental and non-governmental institutions should collaborate with this administration and provide it with data relative to economic, social, demographic (and now environmental) data. CAS produces a bulletin that summarizes the results of all the surveys and studies conducted. Ministries are responsible to produce, manage, and disseminate data relevant to their mandates and tasks. In 1997, the Ministry of Environment (MoE) started working on the Code for the Environment that stipulates all rules and regulations pertaining to flow and management of information. Article 3 in specific stated that an information management system would be established under the supervision of the Minister of Environment. The methods and means to organize environmental management data shall be defined in a statutory order issued by the Council of Ministers and upon suggestion from the Minister of Environment. This Code is currently in the Parliament for approval. All plans related to development and use of indicators, standardization of data, establishment of a comprehensive information network and information Capacity-Building, are part of the Ministry of Environment's goal and were partly executed by LEDO during its two-year duration. Mainly scientists and NGOs are involved in the collection, assessment, management, and dissemination of information and data for decision making for sustainable development. Data is collected by local authorities for project development, scientists and universities for research purposes, NGOs for establishing specialized database, formulating projects, and organizing capacity-building programmes and awareness campaigns. The Forum for Parliamentary Dialogue consisting of an equal number of members of Parliament and NGO representatives, modelled after the Canadian Parliamentary Center, was established in November 1999. A third type of information sharing for decision-making purposes is made possible through the Higher Council for Urban Planning, a coordinating body that encompasses all ministries to formulate decisions pertaining to land-use planning. NGOs are constantly kept informed by the various decisions and activities undertaken by the Ministry of Environment through their participation in the activities carried out by MoE. The Council for Development and Reconstruction issues regular bulletins outlining its activities and including all ongoing and completed projects.

Programmes and Projects: In early 2000, a project was launched at MoE with the aim of providing information on sustainable development. The Lebanese Environment and Development Observatory (LEDO) is a project funded by the European Commission – LIFE Third Countries, managed by the United Nations Development Programme (UNDP), and hosted by the Ministry of Environment. This project provided the infrastructure for information sharing and dissemination, including the development of national environment and development indicators. Within the same context, the Fayhaa Municipal Union Observatory (covering a conglomeration of municipalities in north Lebanon) was initiated a tool to help the municipal union in the management of environment issues, through the creation of an information database and a monitoring system.

An Information System for Combating Desertification in Lebanon is put in place at the Ministry of Agriculture. Financed by GTZ, the project is currently working on creating essential data layers entailing variables on climate, vegetation, socio-economic data, land physical features and resources, and land-use.

The CAS is executing the MEDSTAT project, an EU-financed project aiming at harmonizing the statistics of the European Union and its Mediterranean partners, which is to provide a database on environment and development issues. This project is a cooperative initiative with the LEDO project. It is expected to generate baseline data and indicate gaps in information generation.

The annual indicators developed by Central Bank are used to analyse the economic, social, financial trends and evolution in Lebanon, and also for planning and research purposes. The indicators developed by LEDO will serve to assess the environmental situation on national level to be integrated into the policy-making and measure the impact of sectoral issues (solid waste, forestry, water sector, air pollution, biodiversity, etc.) on the environment. The MoE website is a portal site: www.moe.gov.lb that provides access to the various projects operated at MoE

premises. The CAS has a website that is continuously updated and provide up-to-date information on all its surveys and projects.

Status: The computer-mediated communication is very competitive now in Lebanon, and especially in the private sector. This communication is constantly subject to changes and competitiveness enabling the accommodation of the latest information technologies. Public at large is considered the beneficiary number one from the services provided by these commercial companies that provide internet connections and subscription, and services through launching internet-café that are increasing every day in terms of number and geographic expansion. The web pages of these companies expose various types of data. As for the public sector, available databases and networks are inefficiently used due to shortage of staffing at the public institutions, the competitiveness between companies and mainly the consultancy firms (which makes hard the information gathering process), and, most of all, the relative high ages among the public institutions' staff, which has a dampening effect on the overall desire of the personnel to learn and benefit from the use of new technologies. However, all ministries were upgraded to have access to the Internet, and email is gaining grounds as the means of communication among them. Local authorities are newly established; therefore, they are still under process of equipping their institutions with the necessary electronic communication systems. A lack of coordination and information dissemination is highly noticed.

Capacity-Building, Education, Training and Awareness-Raising: The Environment Information Center (EIC) provides lectures, seminars and field sessions of relevance to environment and development, with a focus on remote rural areas. The Association for Forest Development and Conservation (AFDC) inaugurated a permanent exhibition centre where environmental NGOs expose their work and the inhabitants living in the neighbourhood of the Association exhibit their food products that are pesticide-free. In addition, a library focusing on forestry and forest fires is available for public use. The UNDP- Lebanon Country Office organized a UNDP MEDIA Award in 1997 and 1999 for Sustainable Human Development, a contest open to all Lebanese Journalists. The overall objective was to raise awareness and to promote SHD, and to encourage media to become partners and allies for increased and positive reporting on development as well as allies for advocacy. Since January 1995, the MoE has been managing a 300-square meter library in the basement of its building. Beginning with a small number of books and magazines, the library grew quickly and, as of July 2001, the library's computer database contained 2,400 entries including books, periodicals, reports, and magazines in three languages (Arabic, English and French). This database follows the international standards for referencing (i.e., CDS-ISIS) and can be accessed from the Ministry's website. The library is divided into four sections: Books, periodicals, references and mediatec (videos, slides, cassettes and microfilms). Many institutions and embassies frequently donate books and periodicals to the library, which also houses videos and slides. The Ministry updates its website on a regular basis.

Research and Technologies: The National Center for Remote Sensing is a part of the National Council for Scientific Research. Its mandate is to gather and analyse data collected through satellite images to be made available to concerned institutions. The Investment and Development Authority of Lebanon (IDAL) launched a Business Information Centre that would supply all stakeholders, and mainly the Ministry of Environment, with data on future investment projects to assess any needs or requirements for studies on environment impact assessment. The LEDO project also established an environment and development GIS database at the Ministry of Environment.

Financing: No information available.

Cooperation: The MEDSTAT project is implemented by the Central Administration for Statistics, in close collaboration with LEDO. The EUMEDIS Initiative, an EU programme that will create a network of Mediterranean Information Society Focal Points, will fund the internet-based interconnection between the European Research network and the Mediterranean research networks as well as pilot information society projects.

Measures taken to increase the volume of investment in development and/or improving the national information system is mainly related to a thorough follow-up of the Ministry of Environment to international funds, formulation of project proposals to be financed mainly by GEF, EU, GTZ and UNDP and the offices of the international

agencies in the Country. The Central Administration for Statistics (CAS) is also collaborating with funding agencies and international organisations to broaden its spectrum of surveys and studies.

Another programme financed by the EU is the Assistance to the Rehabilitation of the Lebanese Administration (ARAL). This programme aims at supporting the Lebanese Administration to implement the National Administrative Rehabilitation Programme (NARP) both at central and local levels. In particular, this programme will concentrate on central government agencies, ministries, public utilities and local government and Services. This programme will put in place the basis for data standardization. Sharing information on bilateral, regional and international levels are being made through; (1) participation in conferences, seminars and training; (2) filling questionnaires requested by various international entities, such as UNCSO guidelines; (3) invitation of international organizations to contribute to the national experience; (4) fulfilling the obligations required by the Conventions ratified by the Lebanese Government, such as the Climate Change Convention (studies on national GHG emissions, assessment of Lebanon's vulnerability to Climate Change), the Montreal Protocol (status and levels of Ozone depleting substances), and the Desertification and Biodiversity Conventions.

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CHAPTER: INDUSTRY

Decision-Making: The Government of Lebanon has invested significant efforts and resources in improving the environmental performance of classified and industrial establishments, mainly through command and control mechanisms (i.e., permitting system, standards, monitoring) as well as non-regulatory approaches (i.e., financial incentives, cleaner production). The Ministry of Environment (MoE) has initiated several efforts to abate industrial pollution from select industrial branches (e.g., tanneries, paper, olive oil pressing) and is currently setting up a hazardous waste unit to promote sound hazardous waste management practices, as well as designing and initiating an EIA process.

Programmes and Projects: With grant funding from the EU Life program and under UNDP management, the Ministry of Environment developed a strategy to reshape the permitting and auditing system of industries through the SPASI Project (Strengthening the Permitting and Auditing System for Industries). This project developed a permitting system for new facilities, a compliance action plan for existing facilities, environment guidelines for a number of classified establishments as well as national standards for environmental quality. The Ozone office at MoE is also working on phasing out Ozone Depleting Substances (ODS).

Status: The principal threats resulting from industrial activities are air pollutants from power generation plants, cement factories, and various light industries and surface and ground water pollution from industry point sources such as tanneries, metal coating, etc. Almost all industrial effluents are discharged in ground or surface waters without any treatment. In 1995, the industrial sector represented 17.3 percent of the national GDP (about US\$2 billion). In 1999, industry contributed only US\$1.7 billion to GDP.

In 1999, there were 22,026 industrial establishments in Lebanon. About half of these establishments are located in Mount Lebanon and 17.5 percent in the North. According to the Central Administration of Statistics, however, there were 29,282 industrial establishments in 1996-1997, almost 33 percent more than the number of industries reported by the Ministry of Industry.

Most industries in Lebanon are light manufacturing plants. More than ninety percent of all industries employ less than ten people. Only forty-seven industrial establishments employ more than one hundred people and twenty employ more than 250 people. There are twenty-three industrial branches in Lebanon (not including water, power and construction activities). Nearly eighty-nine percent of the industries belong to eight branches only: food and beverages (twenty percent of total), fabricated metal products (16%), non-metallic mineral products (12%), furniture (11%), clothes and dyeing fur (10%), wood products (10%), leather products (6%), and textiles (4%).

As per January 1999, there were seventy-two industrial zones in Lebanon. However, not all of them have been decreed, and none are adequately equipped to host industrial establishments (e.g., waste collection and treatment). Moreover, many industrial zones were established *de facto* and are presently being decreed even though they are located close to residential areas or natural sites. Statistics indicate that almost eighty-two percent of the total classified establishments is located outside industrial zones.

Capacity-Building, Education, Training and Awareness-Raising: The SPASI Project conducted training on Environmental Auditing, and the Capacity 21 Project worked on building the capacities of the industrial sector in applying Good Housekeeping practices.

Information: MoE prepared the State of the Environment Report for the year 2001, which includes detailed information on the status of the industrial sector in Lebanon.

Research and Technologies: Lebanon received about US\$6.2 million for technology transfer relating to ODS phase out. Phase out implies that local industries dismantle and destroy manufacturing equipment that use ODS and replace them with equipment that does not use ODS.

Financing: No information available.

Cooperation: The UNDP, UNIDO, EU, and GTZ support the sustainable development efforts related to industry. The EU and European Investment Bank are among those that provide funding for the programmes and projects.

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CHAPTER: SUSTAINABLE TOURISM

Decision-Making: The concept of sustainable tourism is not considered yet on the national level. However, all tourism issues are under the jurisdiction of the Ministry of Tourism, supported by the National Council for Tourism. At the local level, the Ministry of Tourism works in co-ordination with the local authorities (municipalities). With respect to the role of Major Groups in decision-making, up until now, the decision-making process has been restricted to the government level. At the moment, municipalities consider rehabilitation projects as their sole targeted priorities. Non-governmental organisations are largely involved through activities that they undertake and promote. There are a growing number of private eco-tour operators that are promoting this issue.

The Government's 10-year reconstruction plan (1993-2002) did not prioritise the environment or tourism – they accounted for less than 2.5% of the total envisaged budget (US\$13.3 billion). Nevertheless, an ambitious strategy for developing tourism has been elaborated in 1996, and in 2000, with the support of UNEP/MAP, the ministries of environment and tourism endorsed a strategy framework for sustainable tourism that was prepared.

Programmes and Projects: The Protected Areas Programme of the GEF, launched in 1996, is conducted in five natural reserves. It has among its objectives developing eco-tourism and nature-based tourism in the reserves and the surrounding villages. The MedWet Coast Project, financed by the French Global Environment Facility and managed by UNDP is working on sustainable management of wetlands, including the promotion of sustainable tourism around them.

Status: Tourism in Lebanon has traditionally been urban-based. Most tourists travel to such urban areas as beach resorts, country clubs, casinos, and restaurants. In recent years, however, tourism and recreation are increasingly practiced in natural settings such as forests, protected areas, valleys, and mountain areas. Tourism represents an important and growing economic sector, generating US\$1,300 million in net revenues in 1998, up from US\$673 million in 1994. In 1995, services including tourism accounted for 16.4% of GDP (up from 14.3% in 1973).

Developing accurate estimates of the number of tourists in Lebanon is difficult due to the ambiguity about “who is a tourist”. Many Lebanese return home to see their relatives and declare “tourism” to be the purpose of their visit. The total number of arrivals by land, sea and air has fluctuated significantly since 1993. Total arrivals include tourists as well as other people entering Lebanon (e.g., foreign labour, truck drivers). Passenger arrivals at the Beirut International Airport (BIA) have increased steadily since 1993, reaching 1.1 million in 1999 (up 71% from 1993).

Lebanese and Syrian nationals represented 74% of total arrivals in 1999, up from 31% in 1993. Arrivals from other Arab countries constitute the second largest visitor group, followed by Europeans whose number has tripled in seven years (from 76,500 in 1993 to 224,800 in 1999).

In 2000, international tourists accounted for 27.4% of total arrivals. With the exception of 1997, the annual number of international tourists (excluding Lebanese, Syrians and Palestinians) has increased steadily since 1994. During this period, international tourists coming to Lebanon has more than doubled.

A growing number of small businesses and non-profit organizations specialize in organizing eco-tours throughout the country, as well as in Jordan and Syria. Nine organizations (small businesses and non-profit organizations) provide such a service today, up from one organization back in 1971. In addition, a number of associations (NGOs and federations) offer alternative forms of tourism and leisure trips, including climbing and rappelling, rafting, canoeing, cross-country skiing, mountain biking, speleology, and paragliding. Also, an increasing number of private or community-based initiatives provide camping facilities and various forms of recreation.

Lebanon is being active to promote sustainable tourism, and has planned several activities to be implemented during the International Year of Eco-tourism. There is strong cooperation between the ministries of Environment and Tourism to promote the concept.

Capacity-Building, Education, Training and Awareness-Raising: No training programmes have been formulated for the tourism industry, despite the urgent need. The tourism plan for reconstruction and development highlighted this issue, but it is still not being implemented. On the other hand, tourism technical high schools are introducing sustainable tourism (eco-tourism and nature-based tourism) within their curricula. Since tourism is not within the main policy priorities. There are no specific programmes to educate policy makers in the concept and policy design of sustainable tourism. The Government has undertaken few awareness campaigns so far. However, the ministries of Environment and Tourism are currently cooperating to spread awareness concerning sustainable tourism.

Sustainable tourism practices are supported by NGOs and a few private sector initiatives. NGOs work on promoting locally made products, nature tours, etc. However it is of utmost importance to mention that the concept of sustainable tourism is not well understood at the decision-making level.

Information: The Ministry of Tourism created a Statistics Department in 1994, and data on tourism is becoming more available. Other data could be found in documents or references concerned with development or nature conservation. The Tourism Plan for Reconstruction and Development final report, which was prepared by UNDP and WTO in 1996, includes valuable information on geographic, social and economic context, legal and institutional aspects, tourist sites, etc. Mapping and inventorying of natural resources are/were conducted through several studies such as Tourism Plan for Reconstruction and Development, Ministry of Tourism (1996), The Regional Environmental Assessment Report on the Coastal Zone of Lebanon, Council for Development and Reconstruction (1997), Land cover mapping, Ministry of Agriculture and FAO, The biological Diversity of Lebanon, Ministry of Agriculture (1996) and The State of Environment Report, Ministry of Environment (2001). Information is available through concerned institutions and agencies. The Ministry of Tourism has a Web Site to provide data on this sector in Lebanon.

Research and Technologies: All technology-related issues need to be addressed. However they are not applied yet. The SPASI project developed an Environmental Auditing Manual for Hotels, but still very few hotels are applying the minimum requirements of environmental management systems, as application of such systems is totally voluntary.

Financing: Until now, sustainable tourism has not been subject to any national, regional, or international financial assistance. Attempts have been made by local NGOs and the Ministry of Environment to obtain funding, however, results have not yet been very successful.

Cooperation: The Ministry of Tourism is trying to cooperate with countries at the regional level to promote tourism. However, no set strategy has been developed for that purpose.

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