

## C. SUMMARY AND CONCLUSIONS

This conclusion presents a summary of major findings of this 2001 SOER, reviews some of the key limitations of the report, and outlines basic steps to build on the 2001 SOER in the future.

### C.1 Summary of Major Findings

The 2001 SOER has identified a large number of linkages between population and economic activities on one hand and various environmental media on the other hand. It has highlighted several significant opportunities to promote environmentally sustainable development of Lebanon, a selection of which is summarized next.

#### *Promoting sound agricultural practices including organic farming*

while contributing only about 12.4 percent of total GDP in 1995. The MoA, NGOs, and research centers need to intensify extension programs with the aim of introducing water conservation measures, through optimal irrigation methods, and drought resistant crops. Also, certification and labeling systems are needed to support organic farming practices, which could help revitalize the sector and generate new markets, in addition to reducing the application of agro-chemicals and water consumption.

#### *Classifying and siting industrial facilities*

Several medium to large scale industries emit dangerous pollutants into the air and generate hazardous solid and liquid wastes, with potentially grave repercussions on human health. Other small scale and light industries also raise public concerns because they are often sited in residential areas. Nationwide, 82 percent of industrial establishments are located outside industrial zones.

A five-class system referred to as Classes I to V (Decree 5243/2001) has amended the old classification for classified establishment into three classes (Classes 1 to 3). However, the new decree does not specify any setback distances from populated areas, or explicitly cancel the old decree. Clearly, MoI and MoE need to take necessary measures to reconcile the two decrees and reclassify all industries in Lebanon accordingly based on environmental criteria. Meanwhile, the MoE is pro-actively reviewing existing and developing new legislation for managing industrial and hazardous waste. It is also developing a *Chemical Safety National Plan* to improve and monitor procedures for handling chemical substances (import, transport, storage, manufacturing and disposal).

#### *Implementing the new industrial emission standards*

With the technical support of SPASI, MoE has developed national standards for environmental quality (NSEQ). Promulgated by Ministerial Decision 1/8 (1/3/2001), these standards are in the form of upper limit values for stack emissions and wastewater discharges from existing and new facilities. The NSEQ cover all sectors and replace the corresponding standards under Decision 52/1 (1996). If the Permitting System for new facilities and the Compliance Action Plan for existing facilities were fully implemented, the environmental performance of industries would improve significantly. With the SPASI project coming to an end, MoE will need to continue to develop and implement the

Permitting System for new facilities and the Compliance Action Plan for existing facilities, using a mix of command and control incentives.

#### *Rethinking road projects and safeguarding highways*

Most roads and all highways have been sited and built with no or little regard for environmental considerations. Many road projects have caused the degradation of landscapes and pristine ecosystems in several parts of the country (Afqa/Taraya, Jaj, Harissa, etc.). There is an urgent need to introduce the EIA process to the entire road sector (both classified and non-classified) to the approval of new road projects. Furthermore, roads and expressways are gradually impaired by residential and commercial developments that spring up linearly on each side of the road and open -- sooner or later -- direct access to the road. There is an urgent need to prevent strip development along major highways

#### *Implementing Law 341 to Reduce Air Pollution by the Transport Sector*

Law 341 (August 6, 2001) is perhaps one of the most ambitious laws ever promulgated for the purpose of reducing air pollution by the transport sector and encouraging the use of less polluting fuels. The law is the fruit of a concerted, groundbreaking effort by the Parliamentary Environment Committee, NGOs, and other stakeholders. A number of measures built in the law would require significant resources and political will to implement. To implement the law, serious efforts will need to be deployed very quickly to develop regulations, policies, procedures, guidelines, etc. The MoE has prepared draft decrees which would set minimum quality standards for combustibles (fuel, gasoline, etc.) and exhaust fumes from vehicles.

#### *Fostering environmentally-friendly construction practices*

The MoE and the Higher Council for Urban Planning (Ministry of Transport and Public Works) have developed strong and effective working relationships to promote

GoL is putting the final touches on a new construction law, which it plans to propose to

proposed law would maintain the previous building requirements in unplanned areas in or near existing settlements, but would tighten those requirements outside such areas. The MoE could provide support to the DGUP in implementing this law, such as by helping define the limits of urbanized areas and their immediate vicinity (buffer zone). Anticipated efforts (MoE/LEDO, CERMOC, NCRS) to produce a land use/land cover map of Lebanon would be very useful to complete this mission.

MoE also needs to work with the DGUP to develop and implement specific construction site waste management requirements. In the absence of specific legal requirements, contractors often dump construction waste and debris in ravines and adjacent lots with impunity, and without any regard for the environment and the landscape. The proposed construction law should contain special provisions requiring developers to submit construction site waste management plans as part of any building

such provisions, because many construction projects generally would not be subject to the EIA requirements (e.g., individual buildings).

*Preserving or restoring public access to the beach*

The Ministry of Tourism has recently amended the classification system for tourist accommodations (Decree 4221/2000). According to Article 14 of the Law of Tourism, the Ministry of Tourism may call upon the services of specialists, consulting firms and institutes to conduct a national census of tourist establishments, to classify such establishments and train appointed employees on their inspection and monitoring under the supervision of the Ministry of Tourism. The Ministry of Environment is currently working on a plan requiring and monitoring environmental improvements, including the restoration of public access to the beach. MoE could work with the Ministry of Tourism to ensure that its census of tourist establishments addresses environmental considerations as well.

*Introducing sound water conservation measures*

dismal. A large proportion of buildings (nine percent), manufacturing industries, and farmers continue to pump groundwater at liberty and free of charge. The environmental implications are enormous (i.e., groundwater mining, mineral dissolution, sea water intrusion, salinity buildup in the soil). There is an urgent need to implement existing regulations on borehole drilling and to monitor groundwater pumping. Introducing meters and tariffs on groundwater pumping needs to be explored seriously.

*Shaping the National Land Use Master Plan*

CDR has just launched a project to prepare a National Land Use Master Plan. This activity offers a unique opportunity for all GOL agencies, and in particular the MoE, to develop a National Land Use Master Plan, the first ever for Lebanon.

Between 1992 and 1999, Parliament declared seven nature reserves covering an estimated 2 percent of the Lebanese territory. To date, not enough has been done to unify the classification of protected sites and provide effective conservation management options (i.e., participation of local communities, protection, ecotourism). The MoE has drafted a Framework Law for Protected Areas. Once approved by Parliament, MoE will need to develop specific regulations under the law, providing a range of conservation and management options for different types of protected areas.

Between 1996 and 1997, MoA declared at least 15 forests protected under the amended forest code, banning grazing, felling and harvesting activities inside those forests. Although MoA employs more than 200 forest guards, enforcement remains a problem. In 1998, MoE declared several rivers, valleys and mountaintops as protected sites. MoE will need to develop, in coordination with the DGUP, permitting standards for the construction and operation of any facility around these sites and within a 500-meter buffer zone. Clearing and reforestation, (1) involving the local communities in natural resource management, and (2) continuous monitoring (i.e., forest guards, municipalities).

*Leveraging resources for reforestation*

The GoL has transferred its annual allocation of LBP5 billion (about US\$3.3 million) for forestation from MoA to MoE starting in 2001 and for a five-year period (the and implement a sustainable, grassroots-level reforestation program, which leverages available financial resources. This program would need to examine unconventional reforestation techniques, such as grazing management, rangeland rehabilitation, and aerial seeding in desertification-prone areas.

*Shaping future policies/approaches to Municipal Solid Waste Management*

The solid waste sector in Lebanon is at a major crossroads. Although the MoE is not charged with building or operating municipal solid waste (MSW) facilities, it must take a lead role in shaping future policies and approaches to MSWM. With the exception of MSWM in the extended GBA, and to a lesser extent in Greater Tripoli, solid waste today continues to be managed in a manner that is not protective of human health or the environment. Even in the extended GBA, serious questions are raised about the financial sustainability and replicability of the Emergency Plan for SWM implemented since 1997. The contracts for solid waste collection in GBA are expiring. The Naameh MSW landfill itself will be filled up by mid 2003. Other landfills, such as the Tripoli landfill, are reaching capacity. Reduced to half its original value, SWEMP has been downsized and will focus on completing ongoing activities such as the Zahle landfill, the rehabilitation of the Hbaine dumpsite in Jbeil, and the provision of containers and equipment. The GoL needs to go back to the drawing board and build on the recent/ongoing MSWM experience in GBA, other municipalities, and local communities to develop a concerted national MSWM strategy, to be approved at the highest possible levels.

*Encouraging sound management of special wastes*

In recent years, the GoL has undertaken several studies of special wastes, such as used tires, waste oil, medical waste, and hazardous waste. The GoL has also received several unsolicited proposals from private companies to build and operate waste recycling facilities for olive press cakes, used solvents and used oil, slaughterhouse waste, plastic waste, etc. None of these studies or proposals has actually led to the construction of a waste management or recycling facility. MoE could lead in developing committed policies for promoting sustainable and environmentally sound SWM practices throughout the country and by all sectors (population, industry, agriculture, construction, tourism, energy). In some instances, it may be necessary to award exclusive rights to one or more select companies to collect and manage certain types of waste (e.g., slaughterhouse waste, olive oil pressing cakes, used tires, and waste oils). Ultimately, the GoL must find solutions to the hazardous and medical waste management stalemate and prevent the continued practice of dumping high impact waste into the environment.

*Promoting small-scale wastewater treatment and reuse in rural, semi-arid regions*

The GoL is implementing an ambitious wastewater management plan for urban and semi-urban agglomerations, designed to protect fresh and coastal water resources. Implementation of this program will last several years and cost hundreds of millions of dollars. A study is underway to develop a master plan for the management of sewage sludge that would be generated by future wastewater treatment plants. At the same time,

several localities have implemented local, small-scale wastewater treatment plants with co-funding from international donors (primarily USAID). Local solutions to wastewater management problems could offer a sound alternative to centralized treatment in certain instances (e.g., rural, semi-arid areas). MoE could take the lead in promoting local wastewater management solutions where appropriate and feasible, and thereby help recover much needed water resources.

## **C.2 Key Limitations of the 2001 SOER**

Compared to the 1995 SOER, the 2001 SOER provides a quantum leap of understanding the state of the environment in Lebanon. This improved understanding is made possible by the publication of basic national-level statistics and data that were totally absent in 1995 (CAS censuses and surveys) as well as several targeted studies and reports (industry, transport, biodiversity, etc.). Despite these significant improvements, the 2001 SOER continues to suffer from some basic inherent deficiencies that need to be addressed. Some of these limitations include the following:

- ❑ Errors and inconsistencies in some original data sources;
- ❑ Uneven geographic coverage of certain environmental data;
- ❑ Lack of continuous air and water quality monitoring; and
- ❑ Delayed opportunity to review and comment on the SOER outside MoE.

### *Errors and Inconsistencies in Some Original Data Sources*

Since 1995, public institutions, academia, research institutes and the private sector have generated a wealth of new information on environment and development. In particular, the CAS Census of Buildings and Establishments (1996-1997) has provided a solid foundation for conducting statistically sound socio-economic surveys, such as the CAS Survey of Living Conditions. Beyond the national data generated by CAS and other recognized authorities, some of the recent data are generally poorly structured, sometimes internally inconsistent, and often inconsistent with data produced by other sources (e.g., data on the number of vehicles). The 2001 SOER has presented data after reviewing and checking them for reasonableness and internal consistency. Nevertheless, some of the data reported may not be totally correct in the original source. For example, several rural Survey, such as the surface area under greenhouse production (see Section 2.1). Nevertheless, while pointing to the limitations of that survey, the 2001 SOER has reproduced the basic data reported by the Agriculture Survey because it is the only recent survey of the agriculture sector in Lebanon.

### *Uneven geographic coverage of certain environmental data*

While the CAS census of Buildings and Establishments provides a solid basis for generating spatially distributed socio-economic data, there is no equivalent tool yet to assist in developing geographic environmental data. Today, various agencies and institutions are developing environmental information that is generally confined in time and space, and the efforts to pool resources and join forces to put together the puzzle

together different institutions to fill gaps and reduce redundancies in data collection can be sustained. The National Center for Remote Sensing is also starting to play a pivotal role in this respect by consolidating spatial data and producing (together with CERMOC)

an *Atlas of Localities*. Clearly, current plans to develop an up-to-date land use/land cover map of Lebanon would provide a unique basis for generating and analyzing spatially distributed environmental data in the future.

#### *Lack of continuous air and water quality monitoring*

Continuous air and water quality monitoring is necessary to assess environmental trends and develop targeted policies for the control or prevention of air and water pollution. To date, many research centers and public institutions continue to generate sporadic and intermittent air and water quality data. Such data are usually localized in time and space and therefore do not allow for a meaningful analysis of trends and definition of priorities. Although valuable state-of-the-art air and water sampling and analysis equipment is gradually becoming available in Lebanon, no single agency or institution has the resources necessary to monitor air or water quality nationwide. Therefore, concerned public agencies, research centers, and academic institutions need to work together to develop and implement a national strategy for air and water quality monitoring that would help them meet their overall needs and mandates and could be achieved by pooling their respective resources.

#### *Delayed opportunity to review and comment on the SOER outside MoE*

To prepare this report, the authors reviewed over 150 reports and publications and consulted more than 60 professionals in both the public and private sectors. MoE and LEDO staff reviewed the draft report and provided substantive feedback and comments, which were incorporated into the final SOER to the extent feasible. However, the draft SOER was not circulated outside MoE for feedback and comments. Also, no workshop was organized to present and discuss the draft SOER and solicit feedback and comments from knowledgeable parties.

Therefore, the 2001 SOER may contain certain errors or inaccuracies; also, some readers may not agree with some of the analysis or recommendations. Despite these potential limitations, MoE has chosen to disseminate this version of the 2001 SOER as widely as possible (Arabic, English, and HTML) and without further delay because the Ministry believes that a report on the state of the environment cannot be complete or perfect. On the contrary, building on this SOER as a good starting platform and certainly not as the final word on the state of environment in Lebanon, MoE intends to sponsor a sustained participatory effort to refine its national environmental strategy and develop targeted environmental action plans.

### **C.3 Next Steps**

As explained above, MoE will disseminate hard copies of the 2001 SOER in English and Arabic and will make the SOER available in HTML format for browsing on

audience possible, both in Lebanon and around the world, and thus increase public awareness o

policy makers, researchers, students, NGOs and other stakeholders will consult the report, use it as appropriate, and provide input or analytic feedback. Ideally, putting the 2001 SOER on the worldwide web may also generate a dynamic forum for comments and future updates. In the longer term, MoE and LEDO will prepare updates to the 2001 SOER as appropriate.