

## **Desertification and its effects on Economy and Environment**

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The different ecosystems in Lebanon are mainly threatened by deforestation, over-grazing, urban development, road development, bad agricultural techniques, excessive use of chemical products, over-hunting and industrial development leading to desertification.

The soils are new, friable and easily eroded, most of the country being on slope terrain. Relief, rainfall intensity and runoff contribute to the severe water erosion and soil loss, especially where the vegetation cover is reduced or lost.

Many aquatic and terrestrial species have either disappeared or are endangered because of the different threats on their habitats which are threatened along with their precious species by mismanagement of modern agricultural techniques.

In addition, forest fires add to the problems the ecosystems are facing. The frequency and intensity of these fires are a real threat on the sustainability of the forest ecosystems.

They usually occur at the end of the summers and are followed a few weeks later, by the heavy showers of rain, which cause severe soil losses.

Rural exodus has had impacts on land degradation, as abandoned agricultural lands are easily eroded.

After several years of lack of control imposed by the war situation in the country, the Government of Lebanon has realized the importance of linking the environment to the overall development process. Initiatives were launched to save the natural patrimony and promote protection and proper management of natural resources.

As soon as the countries affected by drought and desertification were called for the signature and ratification of the Convention to Combat Desertification, the Government of Lebanon, through the Ministry of Agriculture, signed the CCD in September 1995 and ratified it in December 1995. Consequently, the Ministry of Agriculture is in charge of the implementation of the UNCCD in Lebanon and hosts the National Focal Point. Since then, Lebanon is actively participating in most of the sub regional, regional and international meetings related to the Convention.

After having signed and ratified the UNCCD, Lebanon was expected to work on the implementation of this convention through the elaboration of a NAP. One way to facilitate it was the establishment of an Umbrella Project that aimed at identifying the necessary support and assistance during the preparatory phase of the National Action Program with the assistance of UNDP and FAO. The project was then submitted to different potential donors. This document was then submitted to GTZ and UNDP and led to two projects to assist Lebanon in the preparation and implementation of its NAP.

Based on the UNCCD recommendations, the NAP elaboration process in Lebanon has been carried out in a participatory approach taking into consideration the needs of local communities in affected areas. The process has benefited and made use of the results and recommendations of previously conducted consultations with local communities.

Various steps were undertaken during the NAP elaboration process among these: the establishment of CODIS “**C**ombating **D**esertification **I**nformation **S**ystem” and the preparation of maps using the following indicators: (Climate, Soil, vegetation

cover, Land use and Demography) as well as the preparation of the Desertification prone areas map.

Lebanon recognizes that UNCCD is an instrument for improved resource management. In other words, it can be a successful instrument only if a conducive environment for improved resource management is established and if major impediments are overcome. Therefore, Lebanon will put special emphasis on the following:

- **Strengthening the role of the national Focal Point:** to be capable of successfully performing the functions of mainstreaming and coordination.
- **Improving co-ordination** between the line ministries involved in desertification control and promotion of the integration of NAP-related activities within geographical areas.
- **Creating synergies between the environmental conventions:** mainly biodiversity and climate change
- **Including civil society** by involving it in planning processes for local program and increasing co-operation with NGOs and also by involving it in financial management.
- **Using monitoring instruments:** to monitor and analyze the extent to which the NAP is implemented and the impact measures are having. Benchmarks and indicators will be used for this purpose.
- **Creating financial incentives for resource users,** this would help to achieve area-wide and broad-impact desertification control extending beyond projects and programs.
- **Improving the flow of information between the actors** by using information and communications technologies and other means of communication.

Meetings were held with scientists, decision makers and stakeholders to discuss the causes and effects of land degradation and to formulate proper mitigation measures regarding: Legislative framework, Land use planning, Socio-economic frame conditions, Water management, Forest management, Sustainable agriculture, Rangeland management, Soil conservation and Protected areas and adequate related action plans were taken.

Lebanon has a liberal economy and has suffered from many years of conflict. This allowed types of development without any prior assessment of land potential, alternatives for land use, economic and social conditions. Prime agricultural land was lost to urban and industrial developments, Forests were cleared for agricultural purposes, roads were constructed and quarries and touristic centers were operated without adequate consideration of social and environmental impacts leading to severe land degradation in large areas of Lebanon.

This trend however is starting to change. Decision makers are becoming more aware of the need for proper land use planning for the sustainable management of natural resources and the Lebanese government today is well aware of the need for an integrated planning of land resources and of the need to initiate actions at many levels.

**Socio Economic Frame Conditions:** Poverty in Lebanon is mainly a function of geographical and socio-economic disparities. Widening gap between rural and urban incomes has led to accelerated urbanization, environmental degradation and social imbalance. The absence of basic planning or macro-economic and sectoral policies (social, agriculture, industry, tourism, etc.) deepened the crisis of these sectors having problems of low productivity, the size of enterprise, the lack of appropriate technologies and the lack of investment.

The continuous degradation of the agricultural sector has been one of the major causes behind the impoverishment of the population of rural areas, and is partially behind their migration. Changing policies and initiatives that apply to a productive economy and to social development is needed so that quick sustainable progress is achieved.

The Desertification Pone Areas (DPA) model pointed that special consideration need to be given to the following areas: Baalbeck, Hermel, Akkar, and Southern Lebanon especially the newly liberated areas. Accordingly, a specific action plan was formulated based on the needs and requirements of each locality. The activities in the plan are divided into those that need to be taken at the national level and those which need to be taken at the local level.

**Water Management:** The use of water resources in Lebanon is approaching unsustainable levels because of a lack of effective management policies coupled with increased consumption as a result of expansion of irrigated agricultural land and escalating uncontrolled exploitation of groundwater resources, population growth, and industrial development.

The efficient management of water resources is crucial if the water imbalance in Lebanon is to be addressed. New management and planning policies are necessary to overcome the problems and constraints outlined above. The Ministry of Energy and Water instigated steps aimed at setting the general policy for the management of the Lebanon's water resources, through the formulation of the 10-year plan for the years 2001 till 2011 for water and wastewater management. This is a first step towards proper, sustainable, and comprehensive water management but this should be complemented by improvements in water efficiency (water harvesting schemes, water pricing policy, control pumping of groundwater), and alternative non-conventional water resource usages such as wastewater reclamation to cope with the expected water shortage during the coming decade.

**Forest Management:** Forests were severely neglected during the period of the Lebanese civil war. Therefore, the woodland area of Lebanon has sharply decreased.

Deforestation was and still is basically due to the following factors: urban expansion in the mountain areas, encroachment by agriculture, illegal cutting, illegal grazing and overgrazing, forest fires and inadequate policies on forest management. Deforestation has weakened the soil structure, accelerated soil erosion and led to a general degradation of soil quality.

The Lebanese Government is well aware of the ecological, social and economic value of its forest resources and has initiated many actions aiming at protecting its forests resources. These include the designation of large areas of forests as nature reserves and the initiation of large scale reforestation. These have slowed the rate of forest loss but still much is needed to be done before reaching the 20% forest cover goal

**Sustainable Agriculture:** The increasing demand of a growing population on declining agricultural land enhanced the intensification of the agricultural production system. Problems such as salinity, pest and insect resistance, drop in the water table and depletion of soils are increasingly being observed with negative impacts on productivity which is compensated for by more inputs installing a vicious circle.

People in Lebanon, farmers and consumers alike, are aware of the detrimental effects of current practices but lack the technical know-how and the opportunity to engage in sustainable agriculture practices.

The Lebanese Government is conscious of the importance of providing an enabling environment for sustainable agriculture and will according to its Action Plan Resolve land tenure and property rights issues and carry out and implement a comprehensive Land use plan

**Rangeland Management:** Lebanon is a very mountainous country, characterized by the existence of two mountain chains Lebanon and Anti-Lebanon, oriented NNE-SSW, and separated by the Bekaa Valley.

The grasslands are used for livestock grazing (sheep and goats). Control of grazing is exercised by individual villages or group of villages and the grasslands provide communal grazing in spring.

Livestock production especially of sheep and goats has traditionally been an integral part of the dry-land agriculture in Lebanon. As a result, sheep and goats breeds are very well adapted to local conditions and can survive on scarce vegetation.

Rangelands in Lebanon are shrinking due to urban sprawl and encroachment of agriculture. Moreover, they have suffered a continuous deterioration resulting from overgrazing and overstocking. Marginal lands constitute a significant proportion (40%) of the total area of Lebanon. Converting marginal lands into crop production, combined breakdown of traditional grazing rights and the low productivity of the animals have all contributed to overgrazing due to the overstocking of the shrinking rangelands and accelerated the process of land degradation. In addition, range lands play an important role in soil conservation and groundwater recharge. In semi-arid areas, such as the Northern Bekaa intensive rainfall events on degraded rangelands result in flash floods with dramatic on and off-side effects. Range rehabilitation in these areas would greatly improve water infiltration and groundwater recharge while alleviating flood events.

### **Soil Conservation:**

Land resources in Lebanon, like other Mediterranean countries with a long history of human exploitation, have been subject to increasing pressure for thousands of years. The abundance of mountain rocky lands with shallow soils and bare rocks points to processes of severe erosion and land degradation. Many other problems like contamination, salinity, depletion and urban expansion threaten the limited soil resources. Soil conservation should be regarded in close connection with the sustainable agriculture and environmental protection.

Soil is one of the most limiting factors of production in Lebanon. Current practices are leading to accelerated soil degradation including erosion by water and wind as well as chemical physical and biological degradation. Soil conservation is essential for any sustainable development plan in the country.

### **Protected Areas:**

Since many of the factors contributing to desertification in Lebanon are anthropogenic, the protection of some key areas could be a very plausible intervention for combating desertification.

In this context, there are about 40 sites in Lebanon with various degrees of protection. Out of these, 7 are natural reserves authorized by law: The Palm

Islands, Horsh Ehdén, Al-Chouf Cedars, Tyre coast, Bentaél, Tannourine Cedars Forest and Yammouni and more than 15 are protected by decree; in addition to arm Shbat, which is proclaimed by a ministerial decree. Recently, the Ministry of Environment (MoE) declared by ministerial decree 3 natural sites: Kammouha, Dalhoun Forest and Wadi al Karakir.