

Foreword

Land degradation is a threat to the livelihoods of millions of people in the drylands. It is caused by complex interactions among physical biological, political, social, cultural and economic factors. The international community has acknowledged this threat and convened on June 17, 1994 to agree on a global agenda for action.

At the heart of the Convention to Combat Desertification (UNCCD) is the commitment of affected country parties to prepare and implement action programs to prevent land degradation, mitigate the effect of drought and alleviate poverty.

Lebanon has signed and ratified the UNCCD and is committed to combating land degradation and dealing with the root causes of the problem at the national and local levels. Most importantly, and to fulfill its obligations under the UNCCD, Lebanon has prepared a National Action Program to serve as an umbrella, a guiding framework for the long-term implementation of the UNCCD. The NAP was prepared following a participatory, bottom-up approach involving communities of affected areas and concerned stakeholders. This builds on the decentralization efforts already initiated by the Lebanese Government.

As our country moves further in the path of economic reforms for sustainable development, environmental protection would be given high priority to make sure that any further growth is not achieved at the expense of environmental degradation.

Lebanon has put in place an institutional framework and is committed to strengthen it further to ensure the implementation the NAP and the mainstreaming of the UNCCD with the development policies of the various line Ministries.

In spite of its current financial problems, the Lebanese Government has mobilized internal resources and initiated several activities related to combating desertification in the different sectors including land use planning, water supply and demand management, promotion of sustainable agriculture, soil conservation and sustainable management and conservation of natural resources. However, a thorough implementation of the NAP would require more funding than could be mobilized internally. The technical and financial assistance of international organizations and developed countries parties in

the Convention are highly needed to support our on-going efforts to combat desertification, mitigate the effects of drought and alleviate poverty.

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National Action Programme

***Interventions and
Operational Guidelines***

1. Background

1.1 Purpose and Objective of the UNCCD

The United Nations Convention to Combat Desertification (UNCCD), which entered into force on 26 December 1996, provides the international community with a framework for sustainable development of drylands. The objective of the Convention is to secure the long-term commitment of its parties through a legally binding document. It provides an international framework for states affected by desertification to work jointly with industrialized countries to implement their National Action Programmes. The Convention is thus a powerful instrument for sustainable natural resource management in affected regions and for ensuring long-term, mandatory external support for these efforts.

The Convention is founded on the principle that solutions for the problem of desertification and drought should emanate from the affected dryland populations, supported by partnerships with other concerned actors, both national and international. These solutions and supporting partnerships are undertaken within the National Action Programme (NAP) process as the main instrument for the implementation of the CCD at the national level.

1.2 National Action Programmes

Technical measures alone cannot win the battle against desertification. Efforts to combat desertification must therefore be integral components of national development strategies.

Furthermore, NAPs should define long term strategies and priorities together with the required legal and institutional frameworks.

At the practical level, National Action Programmes must perform two important functions: identify the factors that contribute to desertification in the relevant socio-economic, biological and geographic context; and define practical measures for combating desertification in some or all of the following priority fields:

- Improvement of the framework for poverty reduction
- Promotion of sustainable livelihoods
- Demographic dynamics

- Sustainable management of natural resources

1.3 What is Desertification?

Desertification is a condition of human-induced land degradation that occurs in arid, semi-arid and dry sub-humid regions (precipitation/potential evapotranspiration or P/ETP is between 0.05 and 0.65) (UNEP, 1995) and leads to a persistent decline in economic productivity of useful biota related to a land use or production system. Climatic variations intensify the decline in productivity, restorative management mitigates it. Therefore the following definition has been adopted by the Convention:

“Desertification” means land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities.

1.4 Causes of Desertification

Climatic changes and human activity are the main causes of desertification. The desertification process results from the complex interactions of physical, biological, political, social, cultural and economic factors (see figure 1.1). Unsustainable land-use practices by the local population and human settlement patterns are conducive to desertification processes. Today many traditional agricultural strategies and methods are no longer suitable in the face of economic and political changes and due to population growth and the trend for nomadic pastoralists to become sedentary. Other factors frequently identified as contributing to desertification and preventing sustainable natural resource management are lack of legal security for land users in land tenure issues, lack of technical expertise, and unfavorable global economic factors (notably world trade conditions). Wars and other human induced catastrophes also contribute to processes of land degradation.

These developments have led to soil exhaustion, overgrazing and deforestation, thus placing in jeopardy the future of the productive natural resource base.

1.5 Consequences of Desertification

Desertification is closely linked to serious social problems in developing countries such as poverty, poor health and nutrition status, food insecurity and the negative effects of migration and population dynamics. The net effect prevents sustainable economic and social development in the affected countries.

In addition, desertification diminishes soil productivity, reduces food production, takes from the land its vegetative cover, and even negatively impacts other areas not directly affected by its symptoms, e.g. by causing floods, soil salinization, deterioration of water quality, and silting of rivers, streams and reservoirs. Desertification also aggravates famine situation, imposes enormous costs on society, and jeopardizes social stability. Major macroeconomic losses are also incurred. Worldwide, lost income in areas directly affected by desertification is estimated at about US\$42 billion per year (UNEP, 1995).

2. The NAP Process in Lebanon

Based on the UNCCD recommendations, the NAP elaboration process in Lebanon has been carried out in a participatory way 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. Additionally focused group meetings were carried out with national and international experts having profound experience and working closely with communities of affected areas. This ensured that the reached recommendations were based on the needs of the local communities in the different affected areas.

Below are the various steps undertaken during the NAP elaboration process:

1. Compilation of available data in Lebanon
2. Collection of available literature including reports and studies by development actors, research institutions and government organizations.
3. Establishment of CODIS “**Combating Desertification Information System**”
4. Preparation of maps using the following indicators:
 - Climate
 - Soil
 - Vegetation cover
 - Land use
 - Demography
5. Preparation of Desertification Prone Areas (DPA) map
6. Consultations with national decision makers (Line ministries, Council for Development and Reconstruction) and other governmental bodies (Lebanese Agricultural Research Institute, Green Plan, Litani River Authority)
7. Conduction of Public hearings in affected areas
8. Consultations with cooperatives and other Community-Based Organizations
9. Consultations with regional decision-makers such as the Kaem-makam and Mouhafez
10. Participation in regional coordination meetings between different development actors
11. Conduction of focused group meetings bringing scientists, decision makers and NGOs with solid field experience together to discuss the causes and effects of land degradation and to formulate proper

mitigation measures. Nine meetings were conducted, each focusing on one of the topics below:

- Legislative framework
- Land use planning
- Socio-economic frame conditions
- Water management
- Forest management
- Sustainable agriculture
- Rangeland management
- Soil conservation
- Protected areas

Prior to each of these meetings, a recognized expert prepared a situation paper, outlining the basis for discussion in the focus group meeting. The paper highlights the current situation and problems in the area as well as suggested remedial measures. The group then agrees on the necessary lines of action and formulates recommendations accordingly.

12. Conduction of the National Forum for the adoption of the national action program: The forum brought together representatives of the various stakeholders: relevant government institutions, national and regional research institutes, development actors, UNCCD secretariat, communities of affected areas (municipalities, cooperatives, NGO's) and the private sector.
13. Revision of the NAP based on the recommendations of the National Forum.
14. Organization of a series of decentralized meetings with municipalities of the different Mouhafazats in order to raise their awareness on land degradation processes, UNCCD and on-going efforts at the national level
15. Revision of the NAP based on the recommendations of a national meeting with municipalities of the different Mouhafazats.
16. Facilitation of the national adoption of the NAP by the Lebanese Government.

3. Commitment of the Lebanese Government

The government of Lebanon is committed to combating desertification. For example, it has initiated a large-scale reforestation program and has allocated approx. \$16 million to this end. It is also very active in fighting the root causes

behind land degradation primarily by promoting the development of rural areas and reducing regional disparities. Several programs aimed either directly or indirectly at rural development and poverty alleviation are financed through a mix of budgetary resources and donor agencies.

A comprehensive list of relevant activities, which have been carried out or initiated, is presented in appendix IV.

4. Outlook

This document constitutes a framework, a strategic vision on the actions needed for combating land degradation in Lebanon. It allows for the flexibility needed to deal with changing circumstances. It is envisaged that the strategy outlined in the NAP will be translated into detailed short, medium and long term action plans (including targets and activities) by the national coordination body. Procedures for monitoring and evaluation at the national and local levels will be developed to monitor different aspects including land degradation, the NAP process, UNCCD implementation and the impact of interventions. Feedback from monitoring and evaluation will be used to revise targets and activities based on needs and requirements.

5. Action framework

Combating desertification is an overarching task to which contributions are made by measures from the different sectors as well as by measures relating to the political dimension. The Lebanese government will make efforts to keep combating desertification as a priority task within the framework of sustainable development of the country.

Priority actions were defined based on participatory consultations between the various stakeholders including the conduction of focused group meetings (bringing together scientists, decision makers and NGOs with solid field experience). Causes and effects of land degradation were discussed and proper mitigation measures were formulated. Priority actions were defined under two categories as follows:

Category A: National Framework

- I. Institutional framework for NAP implementation
- II. Legislative framework
- III. Land use planning
- IV. Socio-economic frame conditions

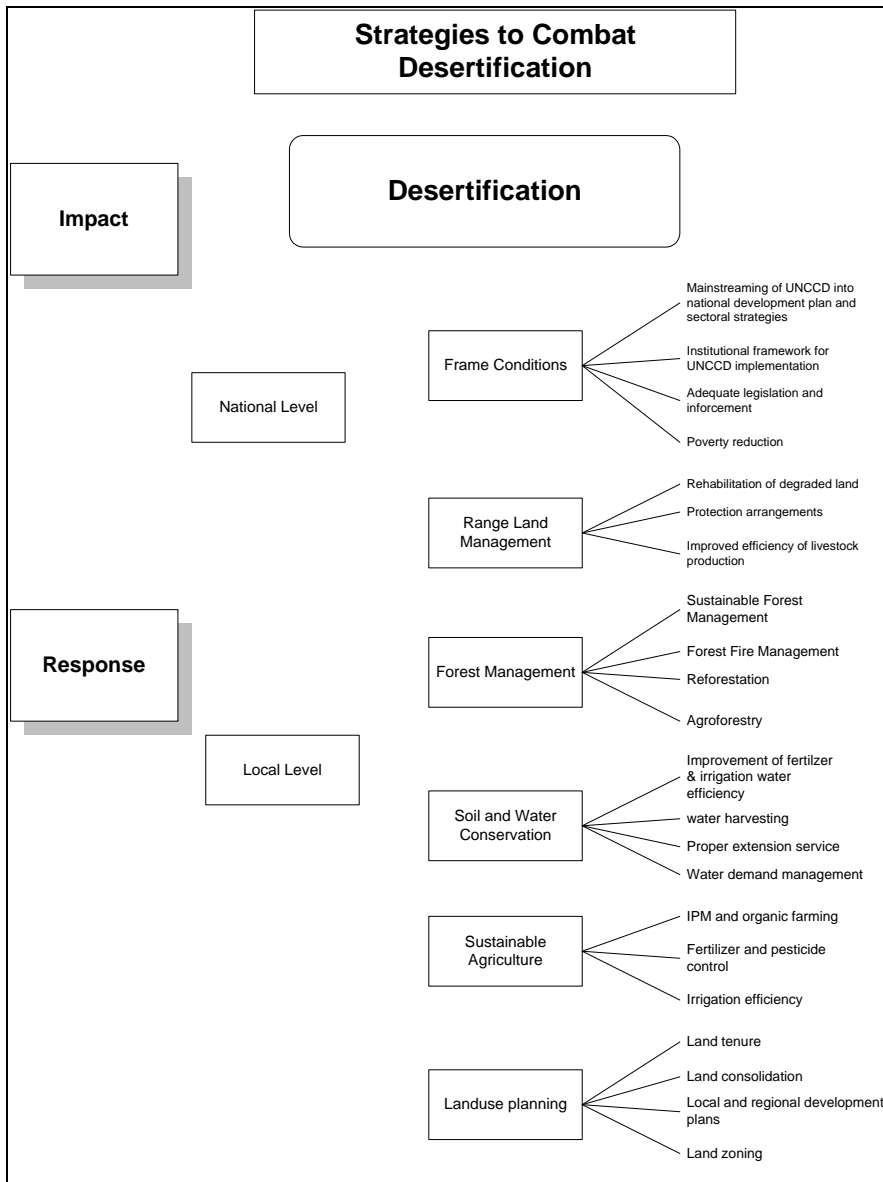
Category B: Natural Resources

- V. Water management
- VI. Forest management
- VII. Sustainable agriculture
- VIII. Rangeland management
- IX. Soil conservation
- X. Protected areas

Moreover and in relation to the above lines of action, the Lebanese Government undertakes to support research activities that contribute to increased knowledge of the processes leading to desertification and drought and the impact of causal factors with a view to combat desertification and achieving improved productivity as well as sustainable use and management of resources. In cooperation with the relevant research institutions, the National Coordination Body (NCB) will highlight the knowledge gaps and the needed research areas. Research activities would respond to well defined objectives and support the implementation of the desertification mitigation measures.

Combating Desertification Framework

Taking into consideration the causes and effects of desertification in Lebanon as summarized in the “problem tree” (see chapter 5), combating desertification necessitates actions at both the local and national levels as outlined in the following flowchart.



5.1 Objective and Guiding Principles

The objective of the NAP is to outline measures needed to combat desertification and mitigate the effects of drought through effective action at all levels supported by international cooperation and partnership arrangements, in the framework of an integrated approach contributing to the achievement of sustainable development of affected areas.

The NAP involves long-term integrated strategies that focus simultaneously, in affected areas, on improved productivity of land and the rehabilitation, conservation and sustainable management of land and water resources, leading to improved living conditions, in particular at the community level.

A successful implementation of the National Action Programme (NAP) can only be achieved in an environment where the following are key guiding principles:

- Capacity building
- Coordination
- Partnerships
- Participation

Capacity building

The NAP is part of the sustainable development strategy of the country and therefore, it entails field level interventions and appropriate policy development in the different relevant sectors. This requires adequate institutional capacities for planning, implementation, monitoring and ensuring community mobilization and participation.

Coordination

To improve efficiency and achieve greater impacts, coordination is needed. Coordination mechanisms need to be established at various levels: between different departments within an involved Ministry, between individual Ministries and between different development actors including government agencies, UN agencies, donor countries, the private sector, NGOs and affected communities. Coordination would help facilitate information sharing, avoid duplication, pool resources and synergize efforts. Ideally, a comprehensive development plan should be prepared and then available resources, financial and human, are pulled together for its implementation.

Partnerships

Combating Desertification is a long-term task in which many actors at different levels need to work together including affected communities, local authorities, national government, the private sector and the donor community. No one individual actor is able to work alone. Partnerships at all levels are required.

Participation

Participation of communities of affected areas is an essential ingredient in the strategy. They are the ones most affected and they are the ones able to reverse the process if given the choice. Ensuring participation of affected communities requires much more than their mere involvement in workshops and assemblies. It requires actions aimed at poverty reduction, empowerment, capacity building, and awareness raising.

5.2 Resources needed for NAP implementation

Lebanon's remarkable decade of reconstruction following a devastating 15 year war saw strong economic growth gradually slide to a halt by 1999. The cost of rebuilding highways, schools, airports, seaports, housing, power stations, and government buildings pushed public debt to about 180% of GDP (2001) and led to chronic budgetary problems. The challenge for Lebanon is to carry through the reforms while reconstructing the economy. This limits the options available for the government to invest in environmental protection.

A second challenge is to tackle poverty and income disparities. The UN estimates that one third of Lebanese lack basic needs. Weak agricultural productivity and a widening gap between rural and urban incomes have led to accelerated urbanization, environmental degradation and social imbalance.

However, The Lebanese Government is well aware of the importance of environmental protection and sustainable natural resource management for the future development of the country and will therefore make available internal resources as much as possible for the implementation of the NAP.

Given the current economic situation and the investments required for large-scale implementations, Lebanon would not be in the position to fully serve the

costs required for adequate NAP implementation and would therefore be seeking for assistance from the international community.

5.3 Enabling Environment: Actions at the national level

5.3.1 Institutional aspects

In order to ensure an efficient long-term implementation of the UNCCD, a clear institutional and legal framework for the NAP by involving all concerned stakeholders and defining their role in planning, implementing, monitoring and evaluation will be put in place building on existing institutional bodies. The institutional framework will accommodate both local and national needs and requirements and allow for adequate local level participation in the planning, implementation and evaluation phases.

Additionally the institutional framework will provide for a feedback system, which consists of the following components:

1. **Local level feedback system:** Information from the local level on threats, needs and the impact of interventions is transmitted to the national level to ensure a more informed decision making regarding remedial measures and adjustments.
2. **National level feedback system:** A monitoring system that will provide information on on-going desertification processes, progress in UNCCD implementation and the impact of mitigation measures. Indicators would be available to highlight positive and negative trends and allow for adequate planning.

5.3.2 Land tenure issues

Land tenure problems are a key factor in land degradation in Lebanon. Registration and transaction costs are enormous. Roles and responsibilities for managing the common lands are not clear leading to their over-exploitation for grazing, quarrying and agriculture. Land fragmentation due to inheritance laws paralyzes efficient land use. Absence of land use planning leads to prime agricultural land being lost to urban development while enormous costs are being put for land reclamation nearby.

A comprehensive solution for land issues promoting security of access including resolving land disputes, removing barriers for efficient transactions, consolidation of fragmented land and proper land use planning need to be elaborated as an essential ingredient in the strategy for combating land degradation.

5.3.3 Decentralization

The United Nations Convention to Combat Desertification (UNCCD) is based on a democratic, bottom-up approach. It clearly emphasizes that the people who bear the brunt of desertification and who best understand the fragile environments in which they live must be fully involved and be allowed to participate in the decisions that will shape their lives. The first principle of the treaty, commits Parties to 'ensure that decisions on the design and implementation of programmes are taken with the participation of populations and local communities and that an enabling environment is created at higher levels to facilitate action at national and local levels'.

The existing regional inequalities in Lebanon have multiple consequences on balanced development. Economic and productive sectors are concentrated in or near large cities (Beirut, Tripoli, Zahle and Saida), where manpower, labor and markets are found. Efficient local level participation could only be achieved if the regional imbalance in Lebanon is remedied by equilibrating development towards a better territorial distribution of opportunities, facilities and resources.

In Lebanon, administrative decentralization has been recognized as a priority by the Taif Agreement and a special ministry has been set up to galvanize municipal development. The Taif agreement has acknowledged the urgency of establishing elected regional councils (majlis qada's). Such actors would be

specialized agencies aiming at developing their region comprehensively. They would also contribute to assert regional identities that would help promoting private investments in economic activities.

Properly planned decentralization would involve multi-centered governments doing local things locally, regional things regionally and national things nationally. Resources and decision-making powers would be available at the local and regional levels. This would greatly enhance efficient natural resource management making the users of the resource directly responsible for their choices.

5.3.4 Capacity building for cooperatives and municipalities

Municipalities, as local authorities, have a key role to play as a mediator in reaching consensus for local level development based on a participatory approach accommodating the needs and requirements of the different socio-economic groups in the locality.

In Lebanon and as a result of many years of conflict, municipalities became more marginal and lack the capacity (financial and human) to adequately fulfill their roles. Moreover, the system is still over-centralized and does not enable municipalities to raise the needed revenues, which would allow them to play a major role. Efforts at decentralization and strengthening of municipalities (USAID, EU) have started and would improve the current situation.

5.3.5 Awareness raising

Combating desertification needs concerted action at different levels and between different groups. At the international level debt for nature swaps, removal of subsidies and fair trade agreements need to be reached. At the national level an enabling environment need to be in place: proper institutional and regulatory framework for natural resource management, comprehensive policies promoting sustainable land and water use, diverse economic options and alternative livelihoods in rural areas. At the local level, communities need to be aware of the impacts of their practices and should be assisted to find the technical and economic resources needed to stop the land degradation process.

People at different levels need to be aware of the problem of desertification and the national and international efforts that are in place to combat it. Once this awareness is reached, networking would be possible and a favorable

framework would be in place for attitudes to change and solutions to be reached.

The UNCCD National Coordination Body will be responsible to elaborate an adequate awareness raising strategy targeting the following:

- Decision makers

There is still little awareness among decision-makers in Lebanon about the problem of desertification and the obligations of Lebanon as an affected country party that has signed the United Nations Convention for Combating Desertification. Politicians need to be aware in order to give due priority to combating desertification and provide an enabling environment by strengthening existing relevant legislation, enacting new laws and establishing strategies, policies and action programmes within the framework of sustainable development plans.

- The general public

The public at large should be aware of the problem of desertification and of the international and national efforts that are in place to combat it. Awareness is a prerequisite for responsible behavior, which is an essential element of the strategy for combating desertification. Special attention should be given to the young generation.

- Communities of affected areas

Desertification cannot be effectively tackled unless the people most affected are fully involved and committed. Awareness is a pre-requisite for involvement and commitment. Commitment can only be ensured if the overall context in which people live and make their decisions is taken into consideration.

It is proposed to draw on existing available resources. For example the awareness and education unit at the Ministry of environment can assist in awareness raising activities.

5.3.6 Resource mobilization

Unlike its sister conventions on climate change and biological diversity, the Convention to Combat Desertification does not establish a new financial "mechanism" to administer funds for Convention-related projects and activities. Instead, it emphasizes the need to mobilize substantial funding from existing sources and to rationalize and strengthen their management.

In order to mobilize the financial resources necessary for combating desertification, Lebanon will:

- (a) Rationalize and strengthen the management of resources already allocated for combating desertification and mitigating the effects of drought by using them more effectively and efficiently, assessing their successes and shortcomings, removing hindrances to their effective use and, where necessary, reorienting programs in light of the integrated long-term approach adopted pursuant to this Convention;
- (b) Seek the assistance within of multilateral financial institutions, facilities and funds, including regional development banks and funds.
- (c) Examine ways in which regional and sub-regional cooperation can be strengthened to support efforts undertaken at the national level.

Moreover, the Government of Lebanon will establish and strengthen, national coordinating mechanisms, which would ensure the efficient use of all available financial resources. It will also utilize participatory processes involving non-governmental organizations, local groups and the private sector, in raising funds, in elaborating as well as implementing programs and in assuring access to funding by groups at the local level.

5.3.7 Mainstreaming

It is of vital importance that NAPs be reflected in national investment programmes, programmes for social and economic development, national sustainability strategies, poverty reduction strategies and in consultations and government negotiations. Unless it is reflected in the aims and strategies of poverty reduction (PRSP), it will be difficult to justify the place of desertification control as a priority area for bilateral co-operation. The National

Coordination body, being made up of decision makers from the various line ministries and government institutions will assist mainstreaming of the NAP into the development plans of the various ministries.

5.3.8 Measures taken to assist the implementation of the CCD

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 co-ordinating.
- **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,** which would help to achieve area-wide and broad-impact desertification control extending beyond projects and programs.
- **Improving the flow of information between the players** by using information and communications technologies and other means of communication.

Action Plan

I. Institutional Framework for NAP Implementation

Lebanon will put in place an adequate institutional framework building on existing institutional structures. The framework will establish linkages between the local and the national levels and will facilitate a bottom-up approach.

1. At the local level, **Local Focal Points (LFPs)** will be assigned (from within the existing administrative structure). LFPs will act as catalysts and will be responsible for the organization of local discussion platforms bringing together the different stakeholders (municipalities, cooperatives, NGOs and other CBOs) to discuss relevant environment issues and develop remedial and local development plans. These will be used for local level decision making and would be communicated to the National Coordination Body (NCB) through yearly reports. This would ensure that environmental considerations are taken into account at the local level and that a bottom-up communication channel is established. LFPs will also coordinate their efforts to deal with more regional aspects.
2. At the national level, the **National Coordination Body (NCB)**, will be assigned and will be made up of representatives of the different line Ministries and relevant government institutions and research centers. The NCB is in charge of steering the UNCCD implementation process. In particular, it is responsible of the following tasks:
 - Identify regional needs and requirements based on LFP reports.
 - Prioritize actions needed at the local and national level and in the short, medium and long term.
 - Communicate relevant information to the various line Ministries and propose joint activities and coordination mechanisms to act on cross-sectoral issues.
 - Communicate relevant information to the Ministry of Agriculture, which is hosting the process and which will then be responsible for communicating issues which need to be acted upon to the council of ministers.
 - Liaise with the Higher Council for Environment once it is operational.
 - Involve the various LFPs in the planning of interventions at the local level in order to ensure a real bottom-up approach.
 - Plan and implement a comprehensive awareness raising strategy.
 - Closely coordinate with MoE, which is the focal point for the committee of the facilitation programme to combat desertification in

Arab countries. (The Minister of Environment is a member of the Council of Arab Ministers of Environment, which follows up on the implementation of international conventions at the regional level).

- Monitor desertification processes and implementation of the UNCCD including the implementation of the NAP and the impact of the various measures.

In order to ensure full representation of all stakeholders, and an adequate technical backstopping on the various lines of action (water management, sustainable agriculture, socio-economics, etc.), the NCB would be supported by **Technical Advisory Groups (TAG)**. These would be made up of researchers, development actors and NGO's. The NCB would act on the recommendations from the local level and from the technical advisory groups to define priorities and action plans. These would be communicated to decision making levels at the relevant Ministries and the Council of Ministers.

The proposed institutional framework will ensure an efficient long-term implementation of the UNCCD and enhance horizontal and vertical linkages between the national and local levels and the different governmental and research institutions.

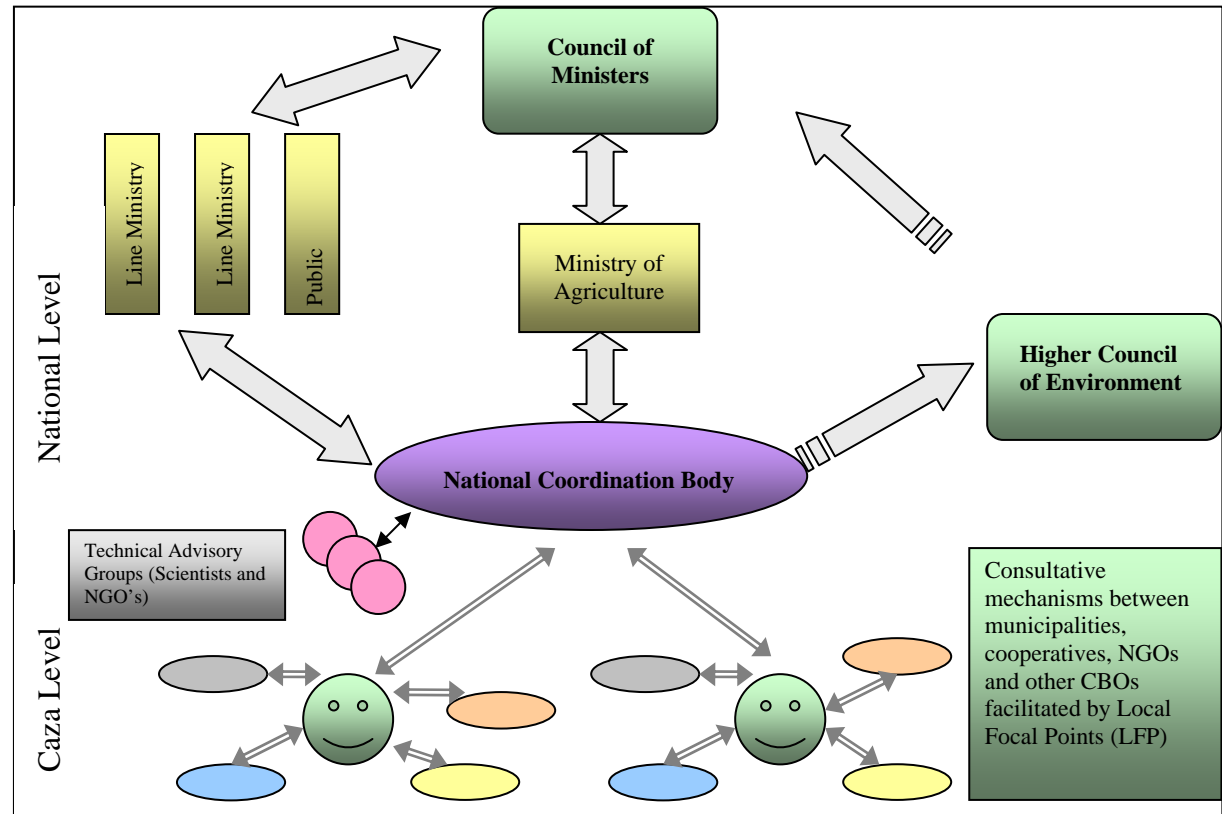
Action Plan

The Lebanese Government is well aware of the importance of a proper institutional framework for implementation of the NAP. Therefore, it will initiate the following:

- Assign Local Focal Points (LFPs) within the administrative structure at the local level (Caza).
- Provide adequate training for LFPs on issues related to land degradation and its driving forces.
- Promote the elaboration of regional and local (municipality) development plans based on local context, needs and requirements.
- Designate a National Coordination Body made up of representatives of the different relevant government institutions.
- Assign Technical advisory groups made up of researchers, development actors and NGO's to assist the NCB.
- Develop clear Terms of Reference for the NCB, the LFPs and the TAGs.

- Define relevant reporting structures for the various communication channels (LFPs to NCB, NCB to decision-makers) based on the needs required by the target audience.
- Establish a monitoring and evaluation system adapted to the local context and based on the UNCCD requirements.
- Coordinate with the national bodies of the other related UN Conventions to ensure synergies in planning and implementation.

Figure 1 Suggested Institutional Model for the Implementation of the UNCCD



II. The Legislative Framework

Situational analysis

There is a stronger recognition in Lebanon that sustainable natural resource management requires a collaborative and concerted effort from all actors. Working within the framework of an evolving legal and regulatory framework, government agencies at the national and local levels are becoming more aware of the need to consider the environmental impacts of their policies and actions, and are gradually building their capacity to manage the environment. Environmental NGOs and the media have assumed increasingly important roles in raising public awareness and supporting grassroots activities. Research institutes and consulting firms are playing a larger part in improving the understanding of the environment. International donors and funding institutions are also contributing to the environmental management process. Although the various pieces of the institutional and legal puzzle are slowly taking shape, it will take a long time before they fall into place (SOER, 2002)

A number of laws, decrees, and ministerial decisions govern environmental management in Lebanon. They are outlined below:

Land and soil

- Decree n° 69, September 6, 1983: Protection of agricultural land
- Law, November 9, 1951: Defines the authority of MoA for the protection of forests and soil from grazing
- Decree n°10659, September 21, 1970: Defines the mechanism for the control of the import, production and sale of chemical fertilizers
- Decision 1/77, August 1998: Gives guidelines for the exploitation and conservation of medicinal and aromatic plants

Conservation of natural sites

- Decision, July 8, 1939: Defines measures to conserve and manage natural views and sites
- Decree n°434, March 28, 1942: Protection of the following areas: Bekat el Arz, Deir ei Kalaa, Forest of Bologna, El Mourouj oaks, Hoursh Beirut, archeological sites of Baalbeck, Yammouneh lake, the natural bridge of Nabaa el Asl,
- Law 19, October 20, 1990: Ratification of the UNESCO Convention for the protection Natural and Cultural Heritage,

Protection of forests

- Forest Law , January 7, 1949: Defines and organizes the protection and exploitation of the forests in Lebanon
- Law 85, September 17, 1991: bans and defines penalties for cutting, exploitation and manufacturing of resinous trees
- Law 558, July 24, 1996: Classifies protected forests, define protection mechanisms and penalties

Reserves

- Law 121, March 9, 1992: Declares Horsh Ehden and Palm Islands as nature reserves
- Decision 1/71, May 13, 1992: Declares a site in Kfarzebid protected
- Decision 1/127, October 1991
- Law 532, July 24, 1996: Declares Al- Shouf Cedar as nature reserve
- Law 718, November 5, 1998: Declares Tyr Coast as nature reserve
- Law 9, February 20, 1999: Declares the Cedar Forest of Tannourine as nature reserve
- Law 11, February 20, 1999: Declares Bintaël as nature reserve
- Decrees 19/1, 22/1, 21/1 all dated 11/3/2002 declare Kammoua, Dalhoun forest and Wadi al Karakir respectively as natural sites for protection.

Water management

- Decision n°144, June 10, 1925: outlines the legal framework for water use and conservation in Lebanon
- Decision n°320, May 26, 1926:
- Decree 14438, May 2, 1970: organizes issues relates to groundwater use

- Article 26 of decree 69/83, 1983: outlines the legal framework for water use and conservation in Lebanon
- Decree No. 680 of September 5, 1990
- Decree 5616, September 6, 1994: outlines the legal framework for water use and conservation in Lebanon
- Law No. 221 of May 29, 2000
- Law No. 241 of August 7, 2000
- Decision 8/1, March 1, 2001: Sets maximum permissible limits for the concentration of pollutants in discharges from classified establishments.
- Decision 24, October 18, 2001: Establishes a special ministerial committee responsible for the revision of decree 5616
- Law No. 377 of December 14, 2001
- Decree No 8122 of July 3, 2002

Mineral extraction activities

- Decision 325, November 8, 1935: outlines the legal framework for quarrying activities.
- Decree 8803, October, 4, 2002
- Decision 2, 77th session of the council of Ministers made the following amendments:
 - localization of quarries in the eastern mountain chain
 - Mandatory rehabilitation of quarried sites at the expenses of the owners by terracing and replanting.

Code of the Environment

- *Law 444, August 8, 2002.*

Other related legislation is listed in appendix 3.

Constraints facing the legislative framework

Several laws and decrees aim at protecting the environment and the natural resource base as outlined above and in Appendix 3. However, these laws and

decrees are not organized into a coherent legislative framework. Problems include:

- Lack of a comprehensive legislative framework for the management of natural resources.
- Roles and responsibilities of the different government institutions are not clearly defined.
- Gaps in legislation.
- Conflicts between existing laws and decrees. For example, some ministerial decrees disconcert the execution of several laws related to forest management and protection.
- Weak enforcement of existing legislation especially with regard to forest management and fertilizer and pesticide issues.
- All-or-non nature of existing legislation with little regard to the livelihoods of affected communities; this leads to encroachment and harmful reactions by these groups.
- Unclearly defined boundaries of protected areas and nature reserves.

Action Plan

The Lebanese Government is well aware of the importance of a proper legislative framework for the sustainable management of natural resources. Therefore, it will emphasize the following:

- Revise existing laws related to management and protection of natural resources, identify gaps, conflicts and remedial measures (in particular laws related to water, fertilizer, pesticide, forest, nature reserves, rangelands and waste disposal)
- Decree laws that define the responsibility and authority of relevant institutions as related to natural resource management
- Use a normative mix of positive and negative enforcement to ensure the protection of natural resources
- Establish protected areas in vulnerable ecosystems.

Project proposal

Elaborate a comprehensive legislative framework for the management of natural resources

Activities

- Revise relevant existing laws and legislation
- Identify gaps in existing legislation
- Compare the existing legislation with the obligations under the environmental conventions (UNCCD, UNFCCC, UNCBD)
- Identify the necessary steps to ensure the domestication of the Conventions
- Prepare a comprehensive legislative framework
- Revise laws accordingly

III. Land Use Planning

Land-use planning is the systematic assessment of land and water potential, alternatives for land use and economic and social conditions in order to select and adopt the best land-use options. Its purpose is to select and put into practice those land uses that will best meet the needs of the people while safeguarding resources for the future. The driving force in planning is the need for change, the need for improved management or the need for a quite different pattern of land use dictated by changing circumstances.

There is bound to be conflict over land use. The demands for arable land, grazing, forestry, wildlife, tourism and urban development are greater than the land resources available.

Two conditions must be met if planning is to be useful:

- The need for changes in land use, or action to prevent some unwanted change must be accepted by the people involved;
- There must be the political will and ability to put the plan into effect.

Land-use planning can be applied at three broad levels: national, district and local. These are not necessarily sequential but correspond to the levels of government at which decisions about land use are 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.

Constraints facing Land Use Planning

- Institutional problems, for example, the absence of a Ministry of Planning
- Lack of clear and consistent policy for sustainable land use
- Inadequate or ineffective regulation of land use
- Lack of funds
- Lack of access to information, tools or training to make informed decisions
- Lack of well targeted incentives, or inappropriate incentives
- Land fragmentation due to inheritance laws
- The legal confusion in land tenure issues and traditional land use rights
- Mines, left over after the war, constitute a major hindrance for any Land Use Planning in several regions (South-Lebanon ...)
- Absence of an inventory of forest resources and unclear boundaries of many declared nature reserves. Currently, the on-going government project on land-use planning will provide basic information regarding these issues.

Action Plan

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. It has already commissioned the Council for Development and Reconstruction to formulate an updated land use plan in close collaboration with concerned ministries and public services.

The Government of Lebanon recognizes that this is only a first step in a long process necessary for implementing an integrated planning approach for sustainable resource management and will therefore support:

- Effective institutions at local, sub-national and national levels which are linked
- An enabling environment and regulatory policy
- A platform for negotiation between the different stakeholders
- The recognition of all stakeholders and their differing objectives
- Bottom-up planning and the development of local land-use plans at the municipality level

- Land consolidation
- An accessible and efficient knowledge base

Project Proposal

Project title

Encourage land use planning at the local level within the framework of regional and national plans.

Project objectives

- Promote popular awareness of land-use problems and opportunities;
- Address local constraints, whether these are related to natural resources or socio-economic problems;
- Feed better information upwards for higher levels of planning

Specific activities

1. Choose one pilot area for implementation
2. Define the planning area
3. Establish goals and terms of reference
4. Initiate a platform for negotiation between all stakeholders:
 - to identify the problems and the opportunities for change
 - Evaluate land suitability
 - Appraise the alternatives: environmental, economic and social analysis
 - Choose the best option
 - Prepare the land-use plan
 - Implement the plan
 - Monitor and revise the plan

Project area

Selected municipalities

IV. Socio-economic Frame Conditions

Situational analysis

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.

According to the Ministry of Social Affairs (MOSA) and UNDP, (UBN¹ method, 1998), the following was revealed: Bint-Jbeil is considered to have the lowest level of needs satisfaction with 67.2% of household living below the threshold followed by the cazas of Hermel (65.9%), Akkar (63.3%), Marjaayoun (60%), El-Minieh (54.2%), Baalbeck (49.2%), and Tyre (45%) and the least is in Kesrouan (13.5%).

On the other hand, 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.

¹ The unsatisfied basic needs (UBN) method is an alternative approach to the measurement of poverty. It measures poverty based on the extent to which the population is deprived of one or more of the basic needs

Ongoing poverty reduction initiatives

CDR hosts many projects aimed at poverty alleviation that are either on-going or in the pipeline (Appendix IV). Under the Integrated Rural Development umbrella, whose aim is “improving public services in certain rural areas that have limited economic development and lack basic services and developing their agricultural, industrial and handicraft production in the framework of balanced development”, the following projects are on-going: Support to the Integrated Rural Development Program for Baalbeck-Hermel, Post-Conflict Socio-Economic Rehabilitation of the South, Reintegration and Socio-Economic Rehabilitation of the Displaced, and Local Community development in the Arab Rural Areas-Lebanon.

Projects under preparation include: Support to the Regional Development of Akkar, Community Development Project, and the Economic and Social Fund for Development.

Based on the situational analysis and DPA model (Chapters three and Six) and given the considerable amount of ongoing projects that would highly contribute to poverty alleviation and improvement of the livelihood of the rural population and in view of the lack of a clear socioeconomic development plan on the national level, the action plan for enhancing the socio-economic frame conditions has to be viewed in light of the following:

- This plan of action requires the collaboration of all entities mainly, CDR, Ministry of Social Affairs and Ministry of Agriculture as being the hosting public institution of the UNCCD. This is to be elaborated and agreed upon within the NCB.
- The action plan can only be successful if implemented within a context of a favorable environment as is mentioned in chapter 7 (see 7.4) on enabling environment. This is mainly with regard to mainstreaming of NAP implementation, awareness raising and capacity building programs (at all levels, from decision making level including the NCB to the grass root or affected population level).
- Many of the activities suggested in the action plan have already been initiated but still constitute dispersed efforts which do not cover the entire area affected by desertification.

Action Plan

The Lebanese Government is conscious of the importance of providing an enabling environment for socio-economic revitalization and promoting the sustainable livelihoods in rural areas. It has already initiated many efforts aimed to this end and will, in particular:

At the National Level

- Explore through the NCB a linkage mechanism to ensure coordination and avoid duplication of efforts of the socioeconomic development and poverty alleviation initiatives within the country both at the national and local levels;
- Increase the allocation of public investment funds to rural infrastructure education, health care, and safe drinking water and sanitation with a focus on the poorer or most vulnerable regions and affected areas;
- Elaborate a well defined long-term social policy taking into consideration the basic elements of social development and poverty alleviation (education, health, housing) that will improve social security and safety nets;
- Formulate integrated rural development programs that are based on a decentralized and community driven approaches and through sustainable use of natural resources in the different affected areas;
- Facilitate job creation and employment opportunities for rural population especially for youth and women, giving importance to the rural-urban interfaces specifically through the following:
 - Build the capacity of the small and medium enterprises in agriculture and processing.
 - Enhance the income of the farmer through efficient extension and transfer of suitable and economically viable alternatives.
 - Support the diversification of agricultural activities and improve the marketing infrastructure.
 - Promote and develop agri-tourism and eco-tourism.
- Conduct regional workshops to identify specific needs, priorities and requirements for the following:
 - Capacity building on the sustainable use of natural resources at all levels (decision makers and local authorities, LFP, public employees, NGO's, schools, affected population etc..).

- Identification of projects that directly contribute to enhancing the livelihood and poverty alleviation in the affected areas.
- Creation of economic incentives and alternatives that lead to the conservation of natural resources.
- Conducting awareness raising campaign at the different levels (decision makers, NCB, LFP, public employees, NGO's, schools affected population etc. on the close link between the sustainable natural resource use and poverty alleviation;
- Rehabilitate irrigation networks and promote the adoption of efficient systems, and the construction of water-harvesting schemes;
- Develop rural finance mechanisms and facilities.

At the Local Level

In addition to the actions suggested at the national level, and within a macroeconomic development plan, special consideration need to be given to each of the following desertification prone areas as follows:

Baalbeck-Hermel Cazas

- Resolving land tenure issues, as an essential prerequisite for sustainable agricultural and economic activities;
- Organizing groundwater use and implementation of water harvesting schemes;
- Promotion of profitable farming systems taking into consideration the sustainable use of natural resources;
- Efficient exploitation of the Assi river with proper irrigation schemes and water distribution networks;
- Establishment of industrial zones.

Akkar Caza

- Promotion of profitable farming systems taking into consideration the sustainable use of natural resources;
- Improving the fish farming sector;
- Development of infrastructure specifically connection to safe water and sewage system and public transport.

South-Lebanon

- Elaboration of a development plan (including a detailed land use plan) that considers the establishment of industrial zones and takes into consideration the sustainable use of natural resources especially in the newly liberated areas.
- Rehabilitation of services and basic infrastructure specifically in the newly liberated zones
- Land reclamation and De-mining operations completion to open up lands to increase cultivated areas and allow economic lands exploitations.

Project proposals*Project title*

Determining profitability and competitiveness of agricultural crops and varieties

Project objective

Conducting feasibility studies for potential crops/varieties that could be suitable to the areas (climatic, physical) to determine their profitability and competitiveness, in the domestic and international markets and highlight crops where Lebanon has a comparative advantage

Project activities

- Analyze productivity and marketability of existing crops and varieties.
- Studying alternative crops and varieties that are best suited (drought tolerant, and higher productivity).
- Analyze causes of high costs of production and finding practical solutions
- Providing extension services and technology transfer on improved, marketable and competitive crops/varieties.

Project duration

3-4 years

Project area

Bekaa, Akkar and Marjaayoun plains

Project title

Promoting ecotourism through local community management in selected rural areas and rural-urban interfaces.

Project objective

The aim is to develop sustainable cultural and ecotourism models that preserve the region's environment and cultural heritage within an economically viable framework. This is through community-based ecotourism in which local communities themselves who plan and implement the activities.

Project activities

- Identify areas suitable for such models (forests, protected areas, valleys, and mountains areas) in connection with municipalities.
- Conducting environmental impact assessment in the identified areas
- Capacity building of the local communities on the management of ecotourism projects
- Conduction of tourist awareness raising campaigns
- Conducting awareness raising of local communities on the economic return of such models within environmentally protected approach
- Development of infrastructure for ecotourism in the selected models

Project Duration

4-5 years

Project area

Northern Lebanon (potential sites: historic sites of Tripoli, Coastal areas of Batroun, Qadisha valley) Bekaa (potential sites : Qaraoun lake, Baalbeck city and Temple surrounding) ; Southern Lebanon (potential sites : emphasis on the newly liberated zones.)

V. Water Management

Situational analysis

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 average annual precipitation in Lebanon is estimated at about 840 mm/year. However, its use is limited by temporal and spatial disparities. Temporally, precipitation is received during a short period (about 80 rainy days between September and May). Spatially, it is not evenly distributed creating sharp regional disparities whereby the annual precipitation varies from a low of 200 mm/year in the northern inland extremes of the Bekaa Plateau to more than 1,500 mm/year at the peaks of Mount Lebanon.

Water demand has traditionally been shared between three principal sectors, namely, agriculture, domestic, and industry. Agriculture is by far the largest consumer of water in Lebanon accounting for more than two-thirds of the total water demand, reaching upwards of 85 percent in certain predominantly agricultural regions. Other activities that exert additional water demand include the generation of hydroelectricity (power plants), recreation (water parks and sports), and aquaculture.

Constraints facing the water sector

The traditional and future water demands vary widely because of different assumptions used in the estimation process, particularly in relation to available land for agriculture, average consumption per hectare, annual population growth, average per capita consumption, and future industrialization potential. While the numbers vary, the consensus is that there will be a deficit in the quantities of water required within the next ten to fifteen years as depicted in the Figure 7.2 below:

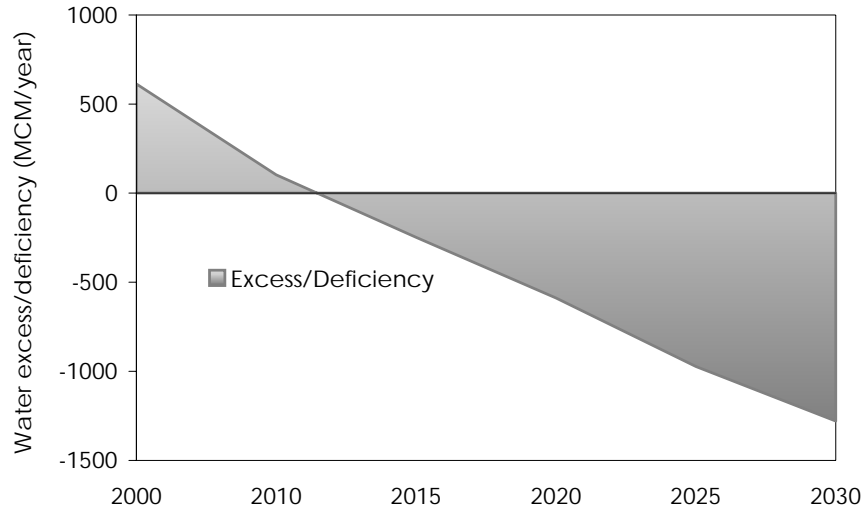


Figure 7.2 Water excess/deficiency between 2000 and 2030

The constraints facing the water sector can be summarized as follows:

- 1) Mounting relative water scarcity
- 2) Water quality deterioration
- 3) Inter-sectoral water allocation conflicts
- 4) Inefficient cost recovery and wasteful operational performance
- 5) Excessive government involvement and bureaucratic restraint
- 6) Weak institutional arrangements.

Action plan

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, and alternative non-conventional water resource usages such as wastewater reclamation and perhaps desalination to cope with the expected water shortage during the coming decade. The Lebanese government is committed to effective water resource management and therefore will:

- Update and consolidate outdated water legislation and its enforcement.
- Assess water resources, initiate or update inventories and project future demands.
- Study the feasibility of developing new water sources (including potential dam locations) and implement feasible projects.
- Install a normative mix of economic and regulatory instruments to promote water use efficiency (including irrigation water use efficiency and wastewater treatment and reuse).
- Encourage the use of water saving irrigation systems.
- Develop and implement water harvesting schemes.
- Control pumping of groundwater.
- Institute effective authorities and adequate coordination. (The government has already reorganized the division of water authorities according to hydrological regions)
- Initiate water pricing policy reform.
- Initiate procedures to protect and enhance water and adopt of the polluter pays principle.
- Develop a proper solid waste management strategy to prevent surface and groundwater contamination.
- Develop sewage networks and wastewater treatment plants to properly manage wastewater.

Specific activities

- Establish protection zones around water sources.
- Issue drinking and irrigation water quality standards.
- Regulate industrial effluent discharge and agricultural runoff into water courses, water bodies, and domestic wastewater networks.

- Introduce water metering and promote user payment.
- Establish a centralized water data management system including a network for hydrological monitoring.
- Rehabilitate water supply and distribution schemes and account for routine maintenance and leakage detection. Recognize the role of water user associations.
- Initiate flood control management schemes.
- Develop a comprehensive plan for improved irrigation efficiency including:
 - Proper water distribution and pricing
 - Sustainable groundwater use.
- Identify knowledge gaps and support needed research such as understanding the hydro-geological behavior of watersheds.
- Improve discharge measurements of perennial and temporary water courses including the suspended sediment load.
- Improve the existing climatological monitoring system to get better information on rainfall distribution including snow measurements.
- Expand the national coverage of aquifer monitoring regarding depth to the water table and groundwater quality.
- Initiate capacity building and training programs for employees of the water authorities.
- Organize Information dissemination and public education campaigns to alter consumer behavior.
- Enforce and monitor compliance with legislation regarding groundwater extraction, discharge flows from classified establishments, etc.
- Strengthen existing extension services to water users in order to promote water efficiency and sustainable water demand management

Project proposal*Project title*

Promotion of irrigation water use efficiency

Objective

To conserve water resources and promote sustainable agriculture through the efficient use of available water resources.

Project activities

- Create and strengthen institutional frameworks for water resource management (water associations, cooperatives)
- Explore possible strategies for the introduction of water pricing
- Study crop water demand and promote suitable irrigation systems and practices

Project Duration

5 years

Project area

Agricultural plains in Bekaa and Akkar.

Project Proposal*Project title*

A pilot study to use water seeping into the coastal areas as a substitute water source for coastal agriculture.

Objective

To tap the fresh water seeping into the coastal areas as a resource to be used in coastal agriculture.

Project activities

- Study of a major underwater freshwater source (seasonality, amount and characteristics).
- Develop a cost effective method of its recovery.
- Develop a partnership between private (agriculturists) and the public sector (the implementation and studies).

Project duration

3-5 years.

Project area

Central coastal Lebanon.

VI. Forest Management

Situational analysis

Forests in Lebanon constitute an important natural resource. The main forest types widespread in Lebanon are Oak (*Quercus calliprinos*, *Quercus infectoria*), Juniper (*Juniperus excelca*), Cedar (*Cedrus libani*), Fir (*Abies silicica*), Pines (*Pinus pinea*, *Pinus halepensis*, *Pinus brutia*) and Cypress (*Cupressus sempervirens*). The bulk of the forest area consists of Oak and Pine stands. In addition, the Lebanese forests contain a wide range of aromatic, wild, and medicinal plants.

Forests were severely neglected during the period of the Lebanese civil war. Therefore, the woodland area of Lebanon has sharply decreased. In 1989, FAO estimated the forest cover at 7% of the total country area and suggested that this need to be increased to 20%. 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.

Constraints facing the forestry sector

- Inadequate Legislation governing the management of the forest
- Inadequate forestry policy.
- Lack of human, technical and financial resources needed for a proper protection and management of forests.
- The frequent incidence of forest fires.
- Over-grazing.
- Inadequate skills for the protection of forests against pests and diseases
- Limited public awareness.
- Rapid and unplanned urbanization.
- Clearance of forests for agricultural purposes.

ACTION PLAN

The Lebanese Government is well aware of the ecological, social and economic value of its forest resources. It is equally aware of the current threats on its forest resources and of the need for immediate action. It 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. Therefore, the Lebanese Government will, in particular:

- Adopt and harmonize forest-related definitions.
- Adopt a participatory approach fostering negotiation with different stakeholders to ensure that local needs are considered in forest management.
- Update, revise and enforce the laws related to forest management.
- Empower and build the capacity of the forest management administration including the forest guards.
- Empower and build the capacity of municipalities and local authorities to engage in forest protection and management.
- Promote and enforce the protection and sustainable management of forests.
- Promote public awareness.
- Develop and implement a long-term reforestation plan in order to achieve a 20% forest cover within a period of 30-40 years.
- Ensure the protection of forests from overgrazing.
- Support pilot projects on forest management.
- Support forest fire management programs.
- Forbid and penalize wood cutting except according to previously agreed management plans.
- Promote the conservation of seeds of local species.
- Support efforts aimed at collecting information and knowledge gained and synthesizing the national experience on forest management.
- Prepare management plans for the protected forests.
- Promote forest research
- Support non-wood forest products

- Prepare a Forest Action Programme including a forest inventory and mapping.
- Implement a unit in the MOA to be in charge of forest organization and management

Project Proposal*Project title*

Establishment of forest management plans in pilot areas.

Objective

Encourage the protection of forests through local participation and the development of local management plans under the supervision of MOA.

Project activities

- Identify a forest area
- Identify stakeholders and current uses of the forest by different user groups
- Establish a negotiation platform involving public authorities, experts, local authorities and user groups
- Develop a local management plan taking into consideration:
 - ⇒ the needs of the different groups and the provision of alternatives where necessary
 - ⇒ Reforestation and maintenance of the forest area
 - ⇒ Conservation and/or sustainable use of local species
 - ⇒ Protection arrangements by local authority and local user groups
 - ⇒ Socio-economic feasibility
- Analyze the experience, lessons learned and inform decision and policy-making.

Project Proposal*Project title*

Monitoring the Effects of Drought on Vegetation Cover and Land Use through Eco-physiological Measurements on Some Forest Species

Objective

The proposed project represents an eco-physiological approach to give adequate responses of the vegetation adaptation mechanisms to drought in relation to climate experienced.

Activities

Observation of daily patterns over seasonal gradient of the most relevant eco-physiological parameters (leaf water potential; leaf stomata conductance; net CO₂ assimilation rate; chlorophyll fluorescence; soil moisture measurements; relative water content).

Budget

Capital cost: 100 000 USD

Running cost: 50 000 USD

Project area

Pilot fields in central and northern Bekaa Valley

Project Duration

3 years

Expected results

Development of a set of applicable guidelines. These will focus on the establishment of an effective mechanism to guide forest cover performance in water scarce and climate adverse environments.

VII. Sustainable Agriculture

Situation analysis

Historically, the Lebanese agriculture suffered from inadequate planning in a “laissez-faire” economy. Additionally, the civil war (1975-1990) led to the displacement of hundreds of thousands of people and increased pressure on many areas resulting in a large-scale unregulated urban sprawl. Large areas of fertile coastal plains and hills were transformed into urban and industrial zones. The Bekaa plain, the main agricultural plain in Lebanon, lost a substantial part of its fertile lands to urbanization. Moreover, the occupation of 15% of the country, for more than two decades, resulted in the abandonment of thousands of hectares of fertile land.

Until the late 70's, agriculture relied more on traditional practices. 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

Action Plan

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, in particular:

- Resolve land tenure and property rights issues;
- Carry out and implement a comprehensive Land use plan;
- Update and enforce the necessary laws and regulations regarding the import, the illegal introduction, the control and use of agro-chemicals;
- Develop a decision support system for farmers including adequate and timely information on markets, opportunities, trends and production techniques;

- Adopt a system approach to improve agricultural productivity and to identify needed interventions in terms of provision of necessary infrastructure, credit, training, post-harvest and marketing;
- Develop and adopt a legislative framework for integrated and sustainable agriculture practices including certification programs and procedures.

Specific activities

- Disseminate information to producers and other stakeholders on trade relationships with neighboring countries (including free trade and signed international agreements) and their expected impacts on the national agricultural sector;
- Establish a clearinghouse for agricultural information (production and processing techniques, markets) and the dissemination of applied research results;
- Review existing farming practices and evaluate their environmental impacts including monitoring water quality;
- Create and strengthen proper institutional frameworks to introduce water pricing and promote irrigation water use efficiency.
- Development of agricultural calendars (date of plantation, crop rotation and cropping patterns).
- Promotion of environmental friendly agriculture (organic farming, IPM and low external inputs for sustainable agriculture (LEISA).
- Develop and implement capacity building schemes for local communities and CBOs and strengthen the infrastructure for agriculture production, post-harvest and marketing.
- Put in place a mechanism providing rural and agricultural credit schemes to support small and medium size initiatives.

Project proposal*Project title*

Promotion of sustainable agricultural practices.

Project Objective

To promote sustainable agricultural production through research and extension on suitable type and rate of agro-chemical application and training on organic farming and IPM techniques.

Project activities

- Identification of the main crops produced in the area
- Formulation of a suitable crop production protocol for each crop
- Training and extension on crop production protocols
- Training and extension on organic farming, IPM and IPP techniques
- Establishment of a cooperative for organic producers
- Link with organic production networks in the country

Project duration

3 years

Project area

Agricultural plains in Bekaa and Akkar and around protected areas where agriculture is practiced.

Other relevant activities

- Promotion of sustainable agriculture practices
- Assessment of existing farming practices and evaluation of their environmental impact (short term)
- Rehabilitation of an abandoned quarry: a study case (short term)
- Strategy for a sustainable management and rehabilitation of quarries and landfills (short term)
- Promotion of water efficient irrigation systems and improvement of water use efficiency (pilot project in different areas, on different crops, soils and climatic conditions).
- Development of a comprehensive land use plan: 1/20000 scale (medium term).

VIII. Rangeland Management

Situation analysis

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, which has an area of 150,000ha. The mountainous region occupies almost 737,000ha (72%) of Lebanese territory.

The grasslands are classified into four categories: the hills and foothills above the coastal zone; the ranges facing the Mediterranean Sea; the slopes of the Bekaa Valley; and the Northern Bekaa Hills. These areas 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.

Table 7.1 shows the land distribution by Mouhafazat between cultivated and non-agricultural areas (FAO, 1980). Non-agricultural areas cover 632,000 ha of which 520,000 or 52% of the total Lebanese area can be considered as rangelands, which include grasslands, mountains and nature pastures and scrublands.

Table 7.1 Land Distributions by Mouhafazat

Mouhafazat	Total Area (ha)	Cultivated Lands (ha)			Non Agricultural Lands (ha)
		Total	Irrigated	Non-Irrigated	
Beirut	1,780	-	-	-	1,780
Mount Lebanon	195,040	61,729	10,535	51,194	133,311
North Lebanon	198,117	64,146	17,636	46,510	133,971
South Lebanon	200,085	98,195	10,173	88,022	101,863
Bekaa	428,028	166,953	25,735	141,735	261,075
Total	1,023,023¹	391,023	64,079	326,944	632,000

Source: Recueil de statistiques libanaises No. 9, 1973.

1 Due to geographical projection, this number deviates from the official figure

Livestock production especially of sheep and goats has traditionally been an integral part of the dry-land agriculture in Lebanon. The sheep and goats belonging to the Awassi and Baladi breeds respectively are very well adapted to local conditions and can survive on scarce vegetation. Sheep numbers have stabilized around 200,000 heads (1970-1990) while goat numbers have increased from 300,000 heads in the 70s to approx. 500,000 heads in the 90s.

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. The major driving forces include:

- Absence of a comprehensive framework for rangeland management
- Absence of land use zoning
- Insecure land tenure rights
- Encroachment of agriculture and quarrying activities
- Inappropriate policies
- Deforestation
- Lack of technical skills of livestock herders
- Inadequate extension service
- Limited understanding of rangeland dynamics and livestock production systems at the institutional level
- Limited participation of stakeholders in rangeland management efforts
- Lack of coordination between public and private institutions dealing directly or indirectly with rangelands issues.
- Breakdown of traditional grazing arrangements and limited experience of local authorities in managing the commons.

Action Plan

Rangelands have a direct use function as grazing lands for herds. In addition, they 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. The Lebanese government recognizes the importance of proper rangeland management and rehabilitation and therefore it will, in particular:

- Develop a comprehensive legislative and policy frameworks with the active participation of all rangeland users
- Support the establishment of proper land tenure systems so that users have long-term stake in sustainable use
- Enhance biomass and vegetative cover of the rangelands
- Support sustainable livestock production through the introduction of improved stock, animal husbandry, stock management, alternative feed resources and health programs
- Support research activities to develop a better understanding of rangeland dynamics, rehabilitation and management techniques
- Support institutional strengthening of livestock herders
- Support an efficient extension service for rangeland management, rehabilitation and sustainable livestock production

Specific activities

- Revise relevant legislation and policies
- Develop a land tenure map
- Assess rangelands in terms of their current use and potential carrying capacity
- Develop a national strategy for management and sustainable use of rangelands
- Initiate pilot activities to identify suitable technical solutions for rangeland rehabilitation and management
- Develop and implement a participatory model for rangeland management in a pilot area
- Improve productivity and management of existing herds and matching stocking rates with rangeland carrying capacities
- Build national capacity in rangeland management and livestock production through technical training and develop an adequate extension service

- Build the organizational capacity of livestock herders through specialized cooperatives
- Upgrade existing nurseries of the Ministry of Agriculture to provide forage seeds and fodder shrubs for rangeland rehabilitation
- Implement a national rangeland strategy

Project proposal*Project title*

Sustainable improvement of rangeland management in Lebanon, a model case

Objective

Develop a model case for sustainable rangeland management in Lebanon; with the participation of local authorities and rangeland users.

Project activities

- Identification of major grazing sites and routes in Lebanon
- Assessment of rangeland condition and intensity of use
- Selection of a group of villages along grazing routes
- Identification of stakeholder groups
- Exploration of current use right procedures including rights of access to resources
- Study of rangeland dynamics
- Institutional strengthening of livestock herders including the establishment of cooperatives and cooperative unions
- Consultations and negotiations between municipalities concerned, livestock herders and other rangeland users on possible rangeland management arrangements including rangeland rehabilitation and protection.
- Development of a mutually acceptable rangeland management protocol binding rangeland users and concerned municipalities.
- Implementation of the protocol
- Evaluation and feedback
- Policy guidance

At the technical level:

- Characterization and assessment of livestock production systems
- Identification of necessary and feasible technical interventions including improved feed and health programs
- Capacity building and training for livestock herders and extension officers on the new techniques
- Implementation of the technical interventions
- Evaluation and feedback

Project duration

5 years

Estimated cost

1,500,000 USD

IX. Soil Conservation

Situation analysis

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, salinization, depletion and urban expansion threaten the limited soil resources. Soil conservation should be regarded in close connection with the sustainable agriculture and environmental protection. Several natural and human factors contributed to land degradation as described below:

Natural factors

- Intensive seasonal rainfall
- Complex landform
- Land sliding due to restricted natural drainage

Human induced factors

- Deforestation and depletion of vegetation cover
- Unsustainable agricultural practices
- Proper agricultural policy and fair terms of trade
- Lack of proper rangeland management
- Absence of a comprehensive land use zoning
- Urban sprawl
- Quarrying activities
- Road construction
- Poor extension service
- Pollution (industries, solid waste disposal, sewage water, etc.)
- Weak legislative framework and lack of enforcement
- Lack of coordination between concerned institutions

Action plan

Soil, like air and water, is essential to support life on earth. Over 90% of all human food and livestock feed is produced on the land, on soils (ISCO,

Precious Earth, 1996). 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. This is why the Lebanese government will, in particular:

- Put in place a proper land use planning and zoning system in order to protect prime agricultural lands from further misuse
- Enhance coordination with concerned stakeholders especially research institutions and local authorities
- Develop a comprehensive legislative framework for sustainable agricultural production and ensure its enforcement.
- Provide an enabling environment for proper rangeland management including proper legislation, zoning and institutional setup.

Specific activities

- Identification of degraded land and formulation of proper rehabilitation schemes
- Promotion of soil conservation practices
- Development and implementation of water harvesting and management schemes.
- Development of a proper extension system
- Development of a strategy for relevant applied research in soil conservation and management issues
- Adopt soil conservation and management topics in agriculture schools and universities.

Project proposal*Project title*

Soil conservation measures in northern part of Bekaa (Qaa- Hermel)

Objective:

To study the causes of land degradation and to plan and implement proper mitigation measures.

Project activities

1. Soil study and soil map at 1/20000 scale
2. Identify soil salinity and land degradation origin
3. Identify causes of soil erosion
4. Plan and implement proper mitigation measures

Project region

Northern Bekaa (Qaa- Hermel)

Project duration

3 years

Estimated project cost

\$ 500,000 USD

Project proposal*Project title*

Comprehensive watershed management

Objective

Develop and implement a comprehensive approach for soil and water conservation in an entire water catchment. The approach can then be used as a model for similar initiatives.

Project activities

- Support sustainable agriculture in the catchment including organic farming and IPM
- Promote irrigation water use efficiency
- Promote soil and water conservation including water harvesting
- Build the capacities of local communities (technical and institutional)
- Enhance livelihoods
- Disseminate lessons learned to inform decision-making

Project Region

Akkar and South

Project Duration

6 years

Project Cost

5, 000, 000 USD

Other relevant activities

- Soil conservation measures in saline and degraded soils of Qaa-Hermel area
- Comprehensive watershed management
- Data Bank for soil studies and projects (short term)
- Assessment of infrastructure for sustainable agriculture (short term)
- Impact of short and long term crop rotation on Nitrogen use and dynamics in soil and ground water ecosystems (short and long term)
- Terraces rehabilitation in the Lebanese mountains
- Afforestation of Akkar basaltic lands with Chestnut (medium term)
- Natural drainage structures (or channels) management (medium to long term)

X. Protected Areas

Situation analysis

Today, there are about 40 sites in Lebanon with various degrees of protection. Out of these, 7 are nature reserves authorized by law: The Palm Islands, Horsh Ehden, Al-Chouf Cedars, Tyre coast, Bentael, 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.

Action Plan

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. This is why the Lebanese Government will, in particular:

- develop a comprehensive legislative framework defining the status, role, responsibility and means of financing nature reserves and protected zones;
- endorse and adopt the proposed framework law for nature reserves and ensure the enforcement of existing legislation;
- define the exact limits of the protected areas;
- give continuing and increased support, including necessary funds, for the provision of an enabling environment to promote sustainable management of protected areas/nature reserves as part of a more comprehensive development plan for the area;
- promote activities, which will ensure that all stakeholder groups in the affected communities are adequately represented, and actively involved in the formulation of management plans for the protected areas;
- support the creation of new protected areas in order to protect fragile ecosystems and to improve inter-connectivity between natural habitats;

- Give increased support for the development of comprehensive land use plans taking into consideration the needs and requirements of environmental protection.
- Define clear roles and responsibilities for the different Ministries involved

Specific measures

- Increase the number of protected areas to ensure that all ecosystems are represented
- Give particular attention to wetlands
- Increase awareness campaigns
- Differentiate between productive and non-productive forest (especially within protected areas)
- Define the different protected areas before adopting the law on protected areas
- Encourage exploitation inside protected areas to the benefit of the protected area
- Impose protection on degraded and desertified areas
- Focus on appropriate research for decision making/taking